

TRANSISTOR MODULE

QCA30B/QCB30A40/60



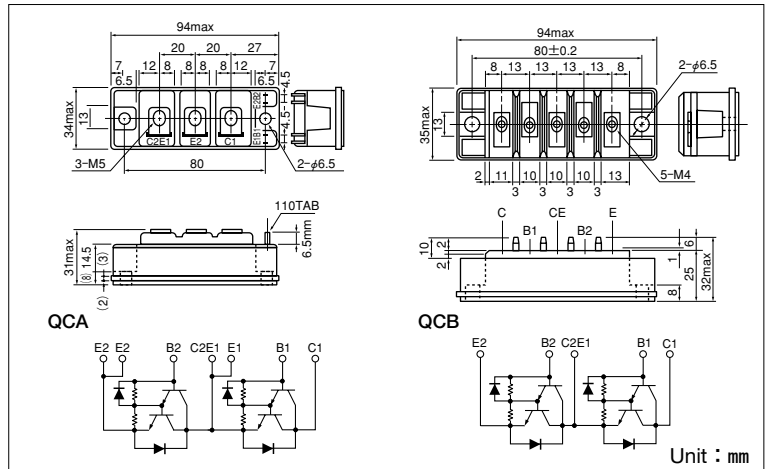
UL;E76102 (M)

QCA30B and QCB30A are dual Darlington power transistor modules which have series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- $I_C=30A$, $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



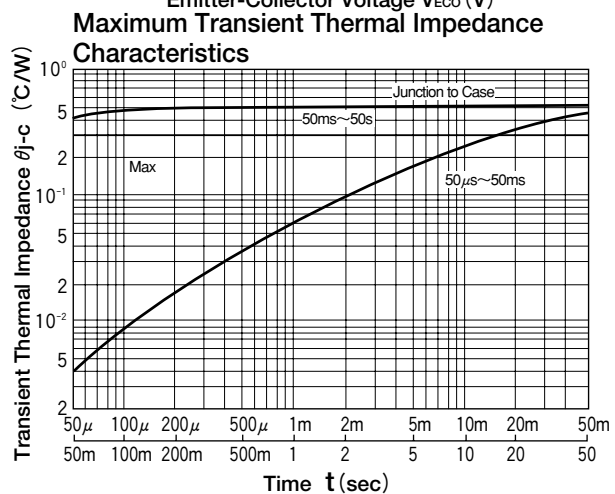
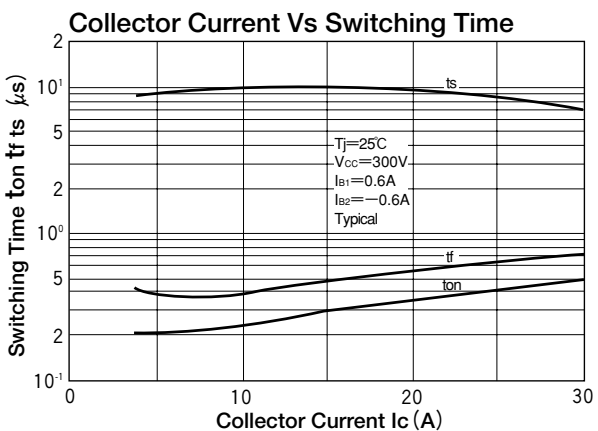
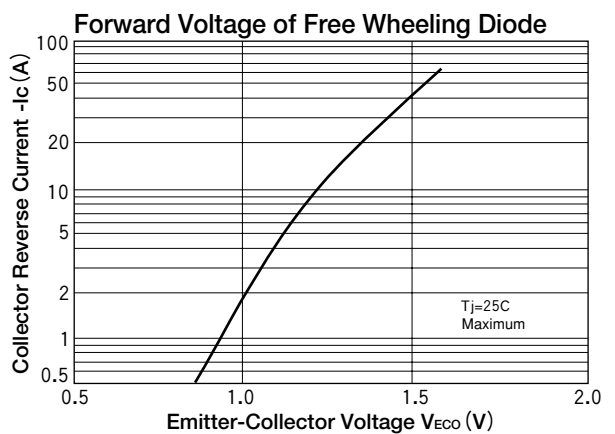
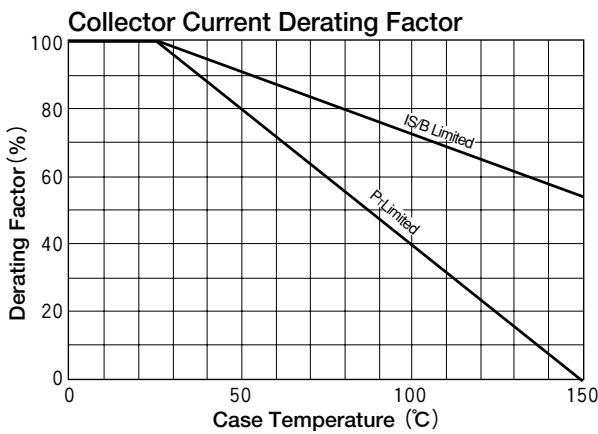
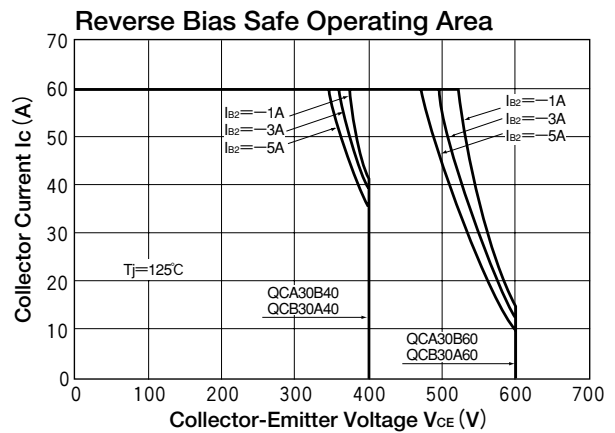
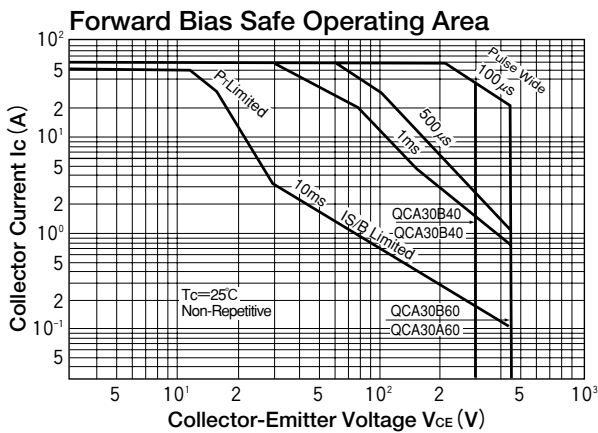
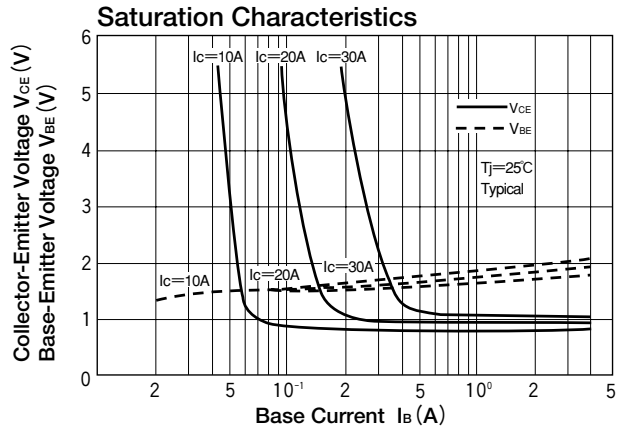
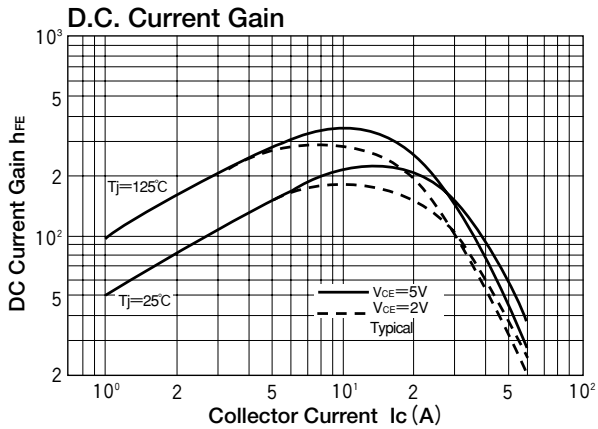
Maximum Ratings

($T_j=25^{\circ}C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit	
			QCA30B40 QCB30A40	QCA30B60 QCB30A60		
V_{CBO}	Collector-Base Voltage		400	600	V	
V_{CEX}	Collector-Emmitter Voltage	$V_{BE}=-2V$	400	600	V	
V_{EBO}	Emitter-Base Voltage		10		V	
I_C	Collector Current	() $p_w \leq 1ms$	30 (60)		A	
$-I_C$	Reverse Collector Current		30		A	
I_B	Base Current		2		A	
P_T	Total power dissipation	$T_C=25^{\circ}C$	250		W	
T_j	Junction Temperature		-40 to +150		$^{\circ}C$	
T_{stg}	Storage Temperature		-40 to +125		$^{\circ}C$	
V_{iso}	Isolation Voltage	A.C.1minute	2500		V	
	Mounting Torque	QCA30B	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
			Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
		QCB30A	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
			Terminal (M4)	Recommended Value 1.0-1.4 (10-14)	1.5 (15)	
Mass	QCA30B/QCB30A	Typical Value	240/195		g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$		300	mA
$V_{CEO(SUS)}$	Collector-Emmitter Sustaning Voltage	$I_C=1A$	QCA30B40 QCB30A40	300	V
$V_{CEX(SUS)}$			QCA30B60 QCB30A60	450	
$V_{CEX(SUS)}$		$I_C=6A, I_{B2}=-5A$	QCA30B40 QCB30A40	400	V
			QCA30B60 QCB30A60	600	
h_{FE}	DC Current Gain	$I_C=30A, V_{CE}=2V/5V$	75/100		
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C=30A, I_B=0.4A$		2.0	V
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C=30A, I_B=0.4A$		2.5	V
t_{on}	Switching Time	$V_{CC}=300V, I_C=30A$ $I_{B1}=0.6A, I_{B2}=-0.6A$		1.0	μs
t_s				12.0	
t_f				2.0	
V_{ECO}	Collector-Emmitter Reverse Voltage	$-I_C=30A$		1.4	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part/Diode part		0.5/1.6	$^{\circ}C/W$



TRANSISTOR MODULE

QCA50B/QCB50A40/60



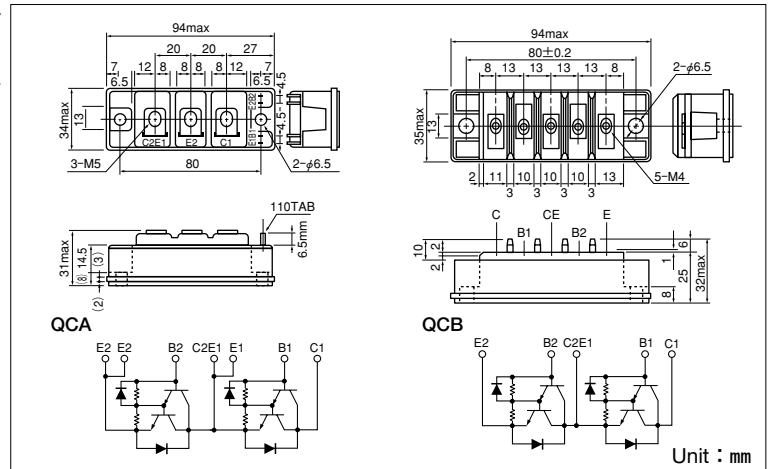
UL;E76102 (M)

QCA50B and QCB50A are dual Darlington power transistor modules which have series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- $I_C=50A$, $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



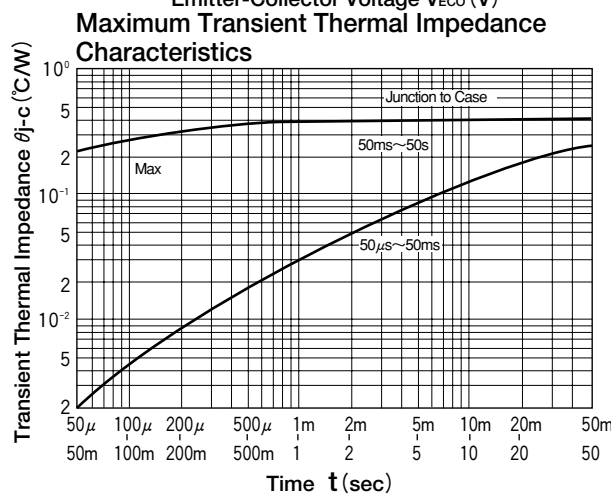
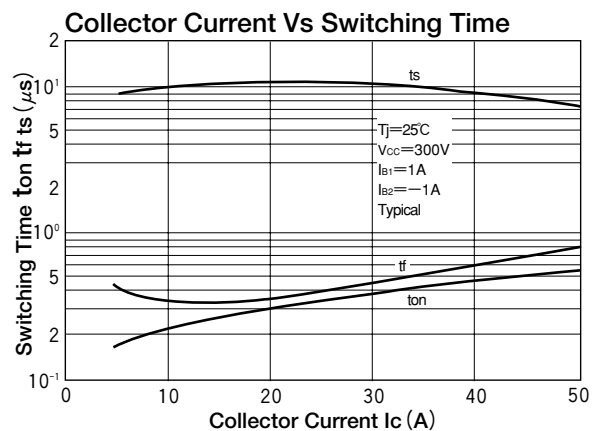
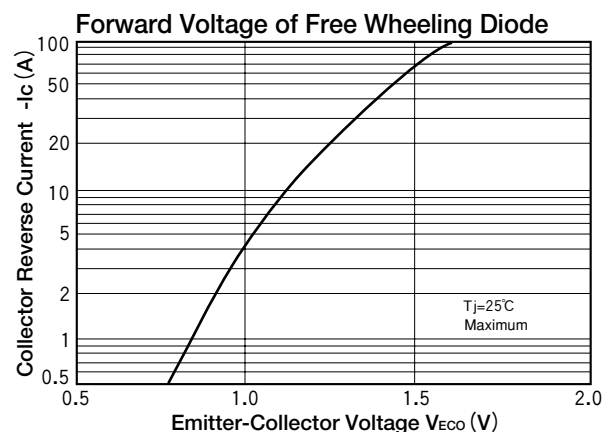
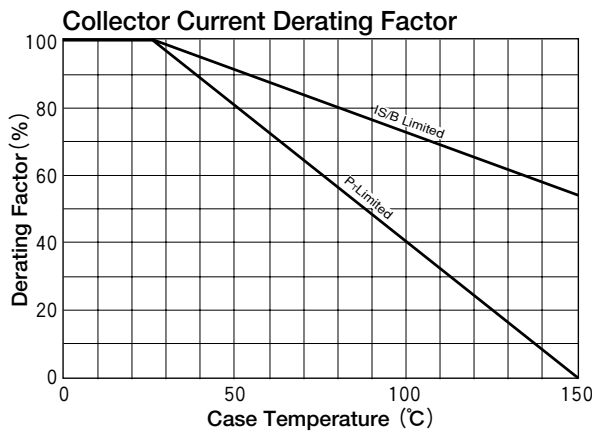
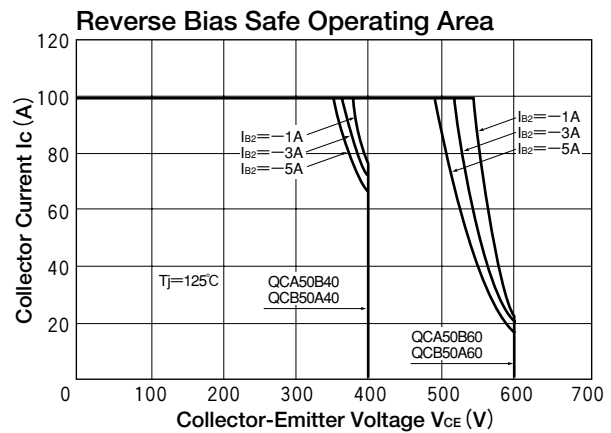
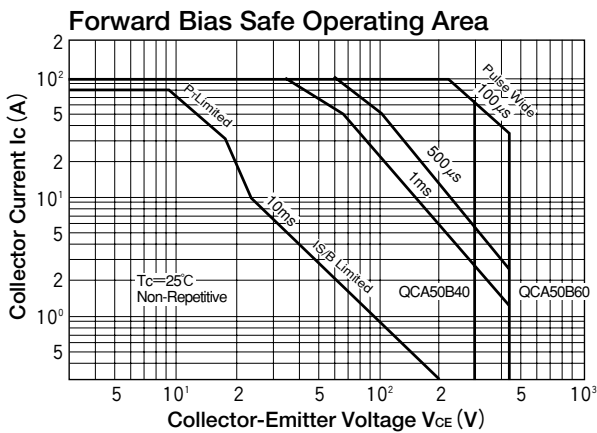
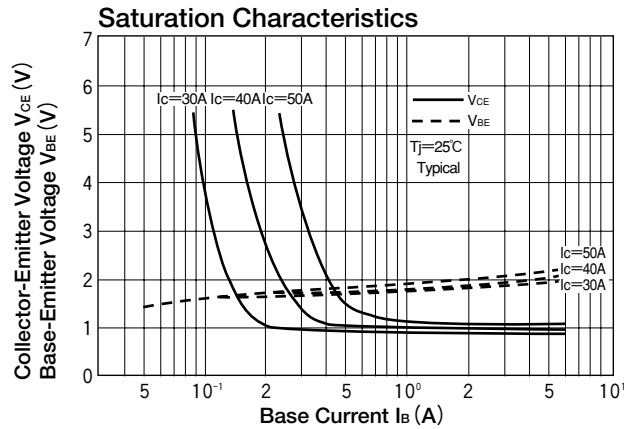
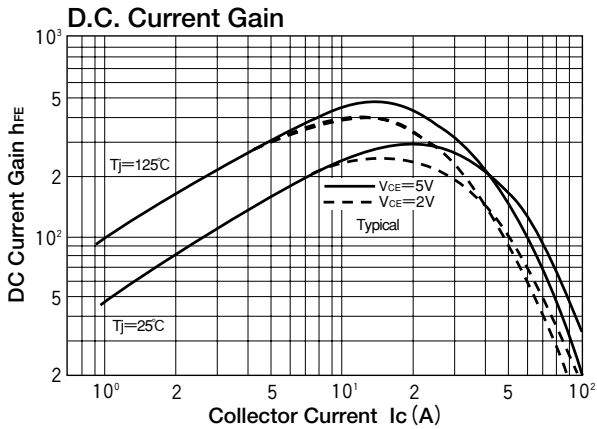
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit	
			QCA50B40 QCA50A40	QCA50B60 QCA50A60		
V_{CBO}	Collector-Base Voltage		400	600	V	
V_{CEX}	Collector-Emmitter Voltage	$V_{BE} = -2V$	400	600	V	
V_{EBO}	Emitter-Base Voltage		10		V	
I_C	Collector Current	() $p_w \leq 1ms$	50 (100)		A	
$-I_C$	Reverse Collector Current		50		A	
I_B	Base Current		3		A	
P_T	Total power dissipation	$T_C = 25^\circ C$	300		W	
T_j	Junction Temperature		-40 to +150		$^\circ C$	
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$	
V_{iso}	Isolation Voltage	A.C.1minute	2500		V	
	Mounting Torque	QCA50B	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m kgf·cm
			Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
		QCA50A	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
			Terminal (M4)	Recommended Value 1.0-1.4 (10-14)	1.5 (15)	
Mass	QCA50B/QCA50A	Typical Value	240/195		g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB} = V_{CBO}$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = V_{EBO}$		300	mA
$V_{CEO(SUS)}$	Collector Emmitter Sustaning Voltage	$I_C = 1A$	QCA50B40 QCB50A40	300	V
$V_{CEX(SUS)}$			QCA50B60 QCB50A60	450	
$V_{CEX(SUS)}$		$I_C = 10A, I_{B2} = -5A$	QCA50B40 QCB50A40	400	V
			QCA50B60 QCB50A60	600	
h_{FE}	DC Current Gain	$I_C = 50A, V_{CE} = 2V/5V$	75/100		
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C = 50A, I_B = 0.67A$		2.0	V
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C = 50A, I_B = 0.67A$		2.5	V
t_{on}	Switching Time	$V_{CC} = 300V, I_C = 50A$ $I_{B1} = 1A, I_{B2} = -1A$		1.0	μs
t_s			Storage Time	12.0	
t_f			Fall Time	2.0	
V_{ECO}	Collector-Emmitter Reverse Voltage	$-I_C = 50A$		1.4	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part/Diode part		0.4/1.3	$^\circ C/W$



TRANSISTOR MODULE

QCA50AA100

TOP



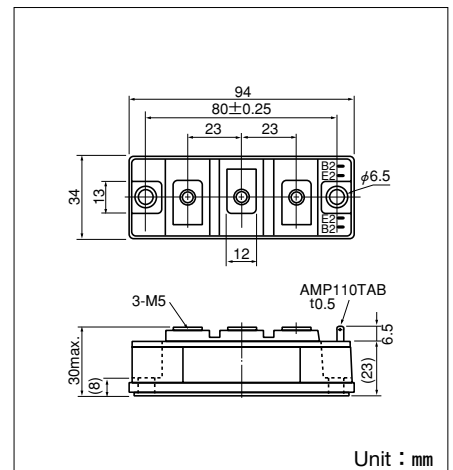
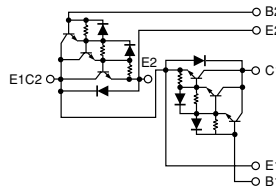
UL;E76102 (M)

QCA50AA100 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=50A$, $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS,
Switching Power Supply, Ultrasonic Application



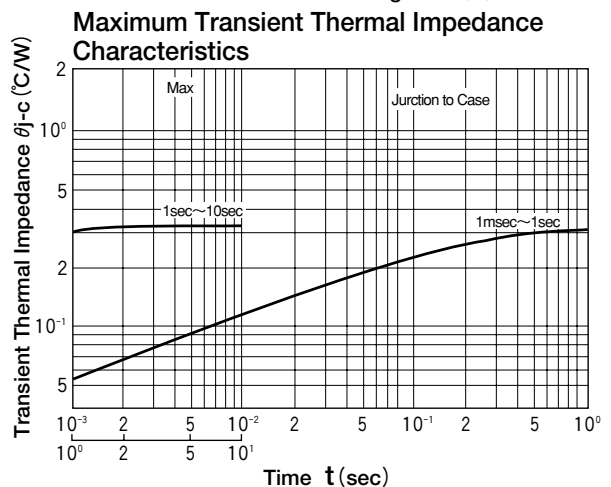
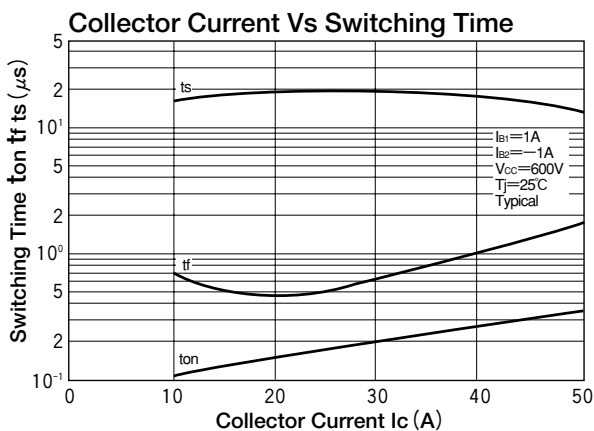
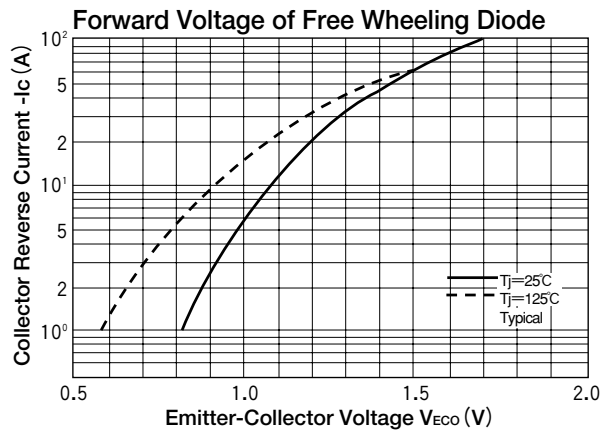
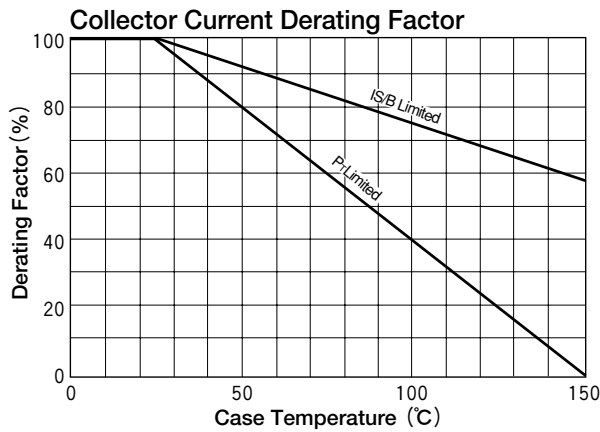
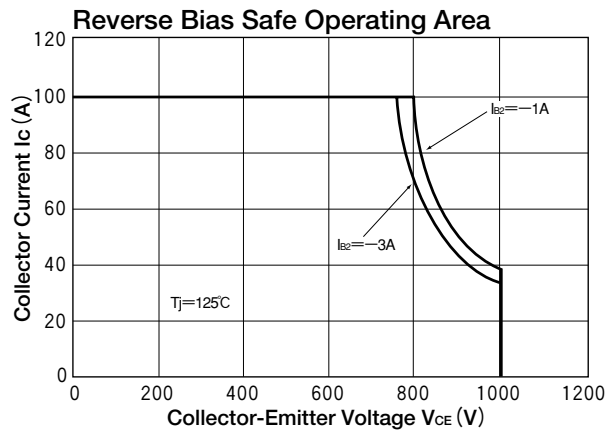
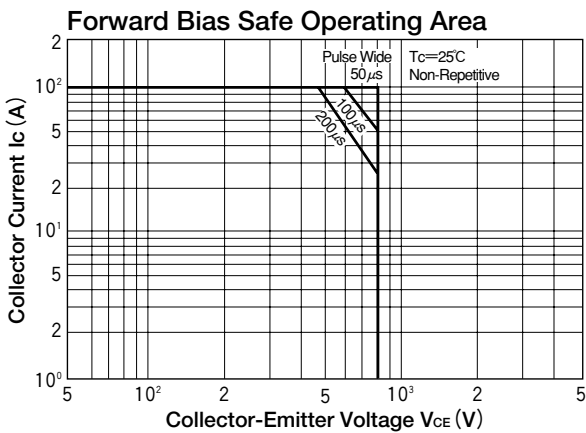
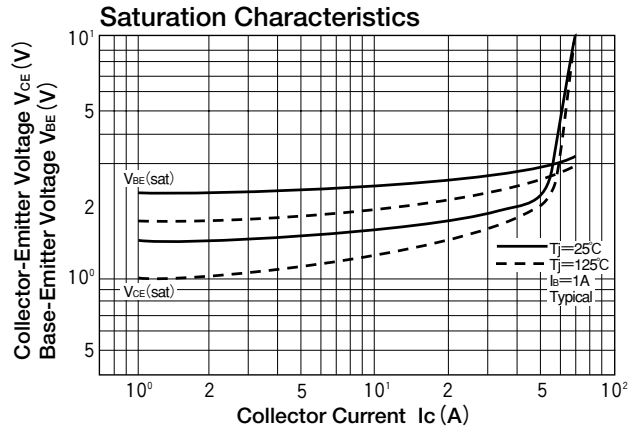
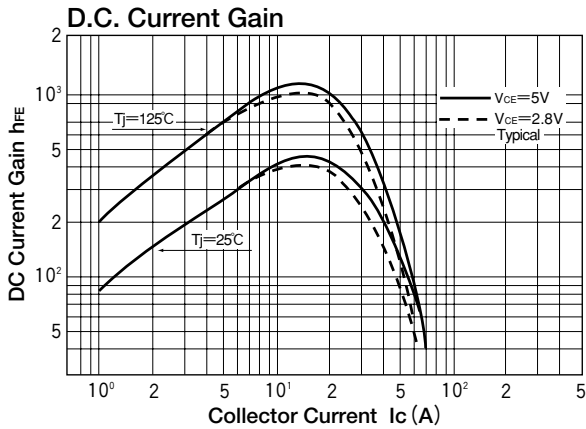
Maximum Ratings

($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA50AA100		
V_{CBO}	Collector-Base Voltage		1000		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1000		V
V_{EBO}	Emitter-Base Voltage		7		V
I_C	Collector Current		50		A
$-I_C$	Reverse Collector Current		50		A
I_B	Base Current		3		A
P_T	Total power dissipation	$T_C=25^\circ\text{C}$	400		W
T_j	Junction Temperature		-40 to +150		$^\circ\text{C}$
T_{stg}	Storage Temperature		-40 to +125		$^\circ\text{C}$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	Typical Value	210		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=7V$		200	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=10A$, $I_B=-3A$	1000		V
h_{FE}	DC Current Gain	$I_C=50A$, $V_{CE}=2.8V$	75		
		$I_C=50A$, $V_{CE}=5V$	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=50A$, $I_B=1A$		2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=50A$, $I_B=1A$		3.5	V
t_{on}	Switching Time	On Time		2.5	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=50A$ $I_{B1}=1A$, $I_{B2}=-1A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=50A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.31	$^\circ\text{C/W}$
		Diode part		1.2	



TRANSISTOR MODULE

QCA50AA120

TOP



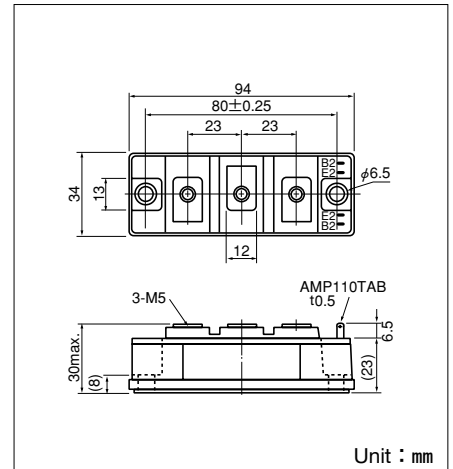
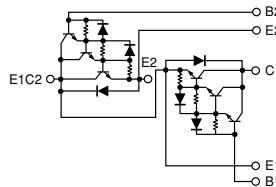
UL;E76102 (M)

QCA50AA120 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=50A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS,
Switching Power Supply, Ultrasonic Application



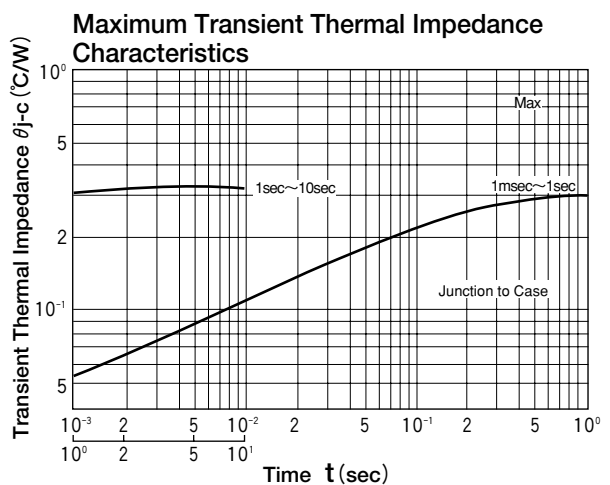
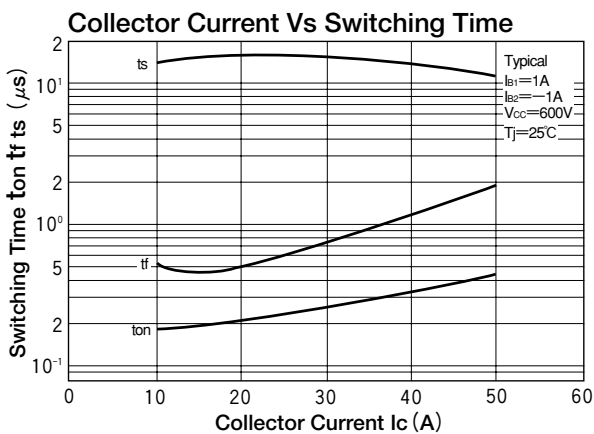
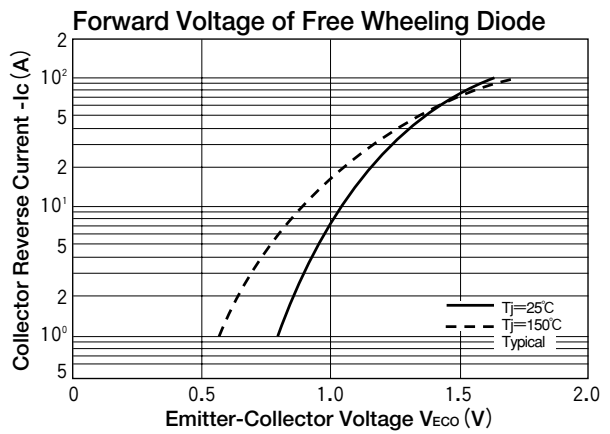
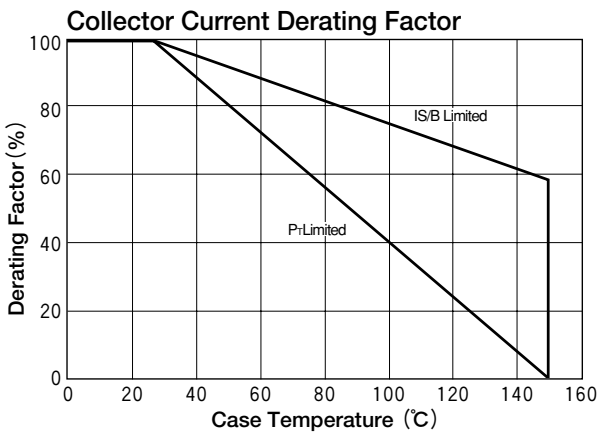
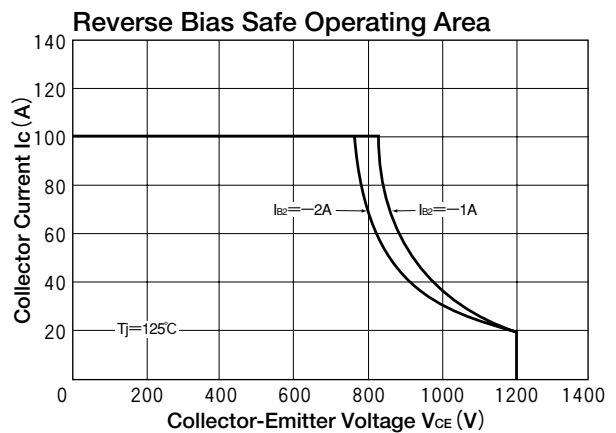
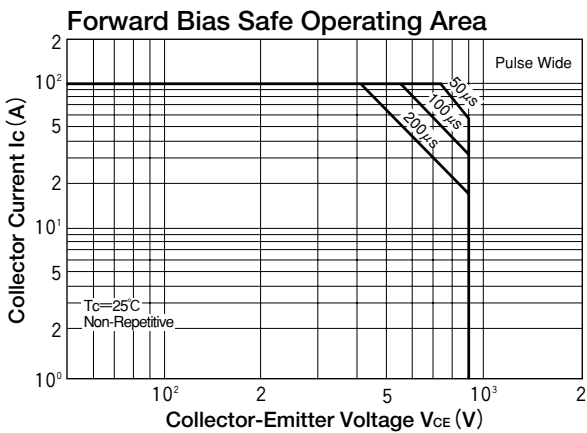
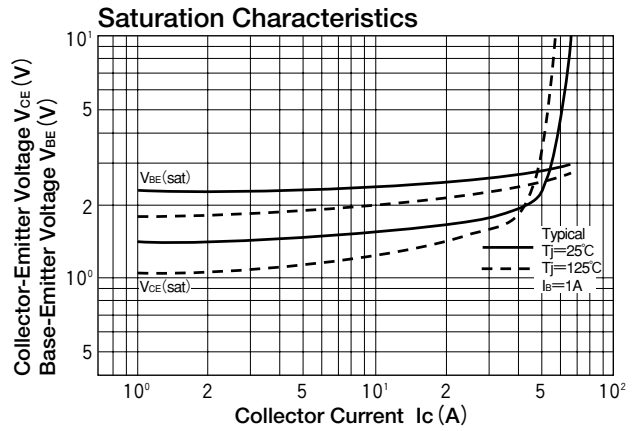
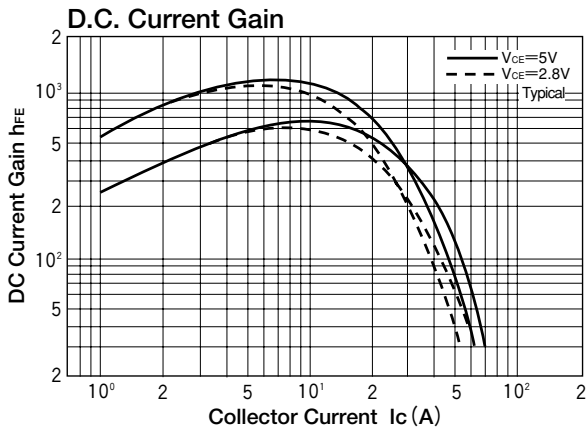
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item		Conditions	Ratings		Unit
				QCA50AA120		
V_{CBO}	Collector-Base Voltage			1200		V
V_{CEX}	Collector-Emitter Voltage		$V_{BE}=-2V$	1200		V
V_{EBO}	Emitter-Base Voltage			10		V
I_C	Collector Current			50		A
$-I_C$	Reverse Collector Current			50		A
I_B	Base Current			3		A
P_T	Total power dissipation		$T_C=25^\circ C$	400		W
T_j	Junction Temperature			-40 to +150		$^\circ C$
T_{stg}	Storage Temperature			-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage		A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)		
	Mass		Typical Value	210		g

Electrical Characteristics

Symbol	Item		Conditions	Ratings		Unit
				Min.	Max.	
I_{CBO}	Collector Cut-off Current		$V_{CB}=1200V$		1.0	mA
I_{EBO}	Emitter Cut-off Current		$V_{EB}=10V$		300	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage		$I_C=10A$, $I_B=-2A$	1200		V
h_{FE}	DC Current Gain		$I_C=50A$, $V_{CE}=5V$	75		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage		$I_C=50A$, $I_B=1A$		3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage		$I_C=50A$, $I_B=1A$		3.5	V
t_{on}	Switching Time	On Time	$V_{CC}=600V$, $I_C=50A$ $I_{B1}=1A$, $I_{B2}=-1A$		2.5	μs
t_s		Storage Time			15.0	
t_f		Fall Time			3.0	
V_{ECO}	Collector-Emitter Reverse Voltage		$-I_C=50A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)		Transistor part		0.31	$^\circ C/W$
			Diode part		1.2	



TRANSISTOR MODULE

QCA75A/QCB75A40/60



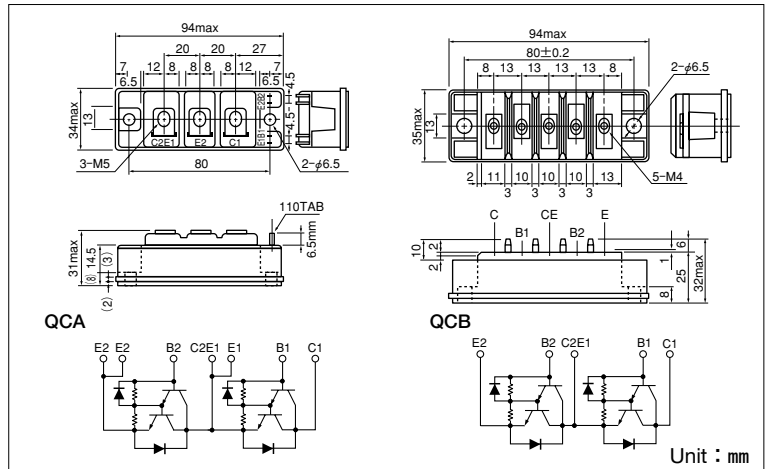
UL;E76102 (M)

QCA75A and QCB75A are dual Darlington power transistor modules which have series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- $I_C=75A$, $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Maximum Ratings

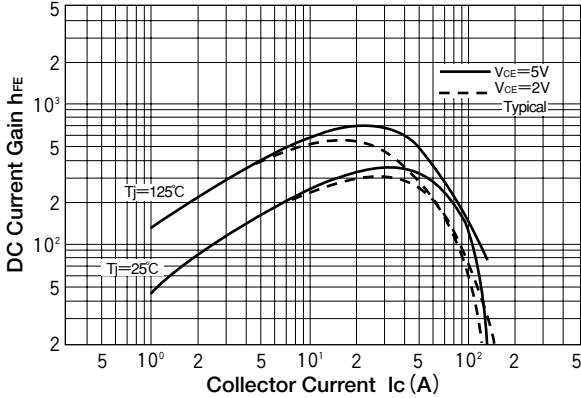
($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit	
			QCA75A40 QCB75A40	QCA75A60 QCB75A60		
V_{CBO}	Collector-Base Voltage		400	600	V	
V_{CEX}	Collector-Emmitter Voltage	$V_{BE} = -2V$	400	600	V	
V_{EBO}	Emitter-Base Voltage		10		V	
I_C	Collector Current	() $p_w \leq 1ms$	75 (150)		A	
$-I_C$	Reverse Collector Current		75		A	
I_B	Base Current		4.5		A	
P_T	Total power dissipation	$T_C = 25^\circ C$	350		W	
T_j	Junction Temperature		-40 to +150		$^\circ C$	
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$	
V_{iso}	Isolation Voltage	A.C.1minute	2500		V	
	Mounting Torque	QCA75A	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7(48)	N·m kgf·cm
			Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7(28)	
		QCB75A	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7(28)	
			Terminal (M4)	Recommended Value 1.0-1.4 (10-14)	1.5(15)	
Mass	QCA75A/QCB75A	Typical Value	240/195		g	

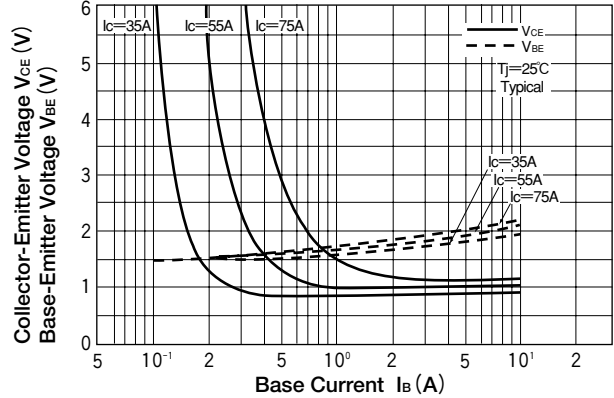
Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB} = V_{CBO}$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = V_{EBO}$		300	mA
$V_{CEO(SUS)}$	Collector Emmitter Sustaning Voltage	$I_C = 1A$	QCA75A40 QCB75A40	300	V
$V_{CEX(SUS)}$			QCA75A60 QCB75A60	450	
$V_{CEX(SUS)}$		$I_C = 15A, I_{B2} = -5A$	QCA75A40 QCB75A40	400	V
			QCA75A60 QCB75A60	600	
h_{FE}	DC Current Gain	$I_C = 75A, V_{CE} = 2V/5V$	75/100		
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C = 75A, I_B = 1A$		2.0	V
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C = 75A, I_B = 1A$		2.5	V
t_{on}	Switching Time	$V_{CC} = 300V, I_C = 75A$ $I_{B1} = 1A, I_{B2} = -1A$		2.0	μs
t_s				12.0	
t_f				3.0	
V_{ECO}	Collector-Emmitter Reverse Voltage	$-I_C = 75A$		1.4	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part/Diode part		0.35/1.3	$^\circ C/W$

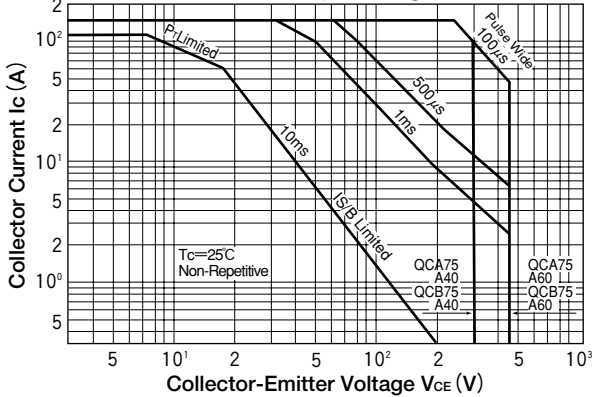
D.C. Current Gain



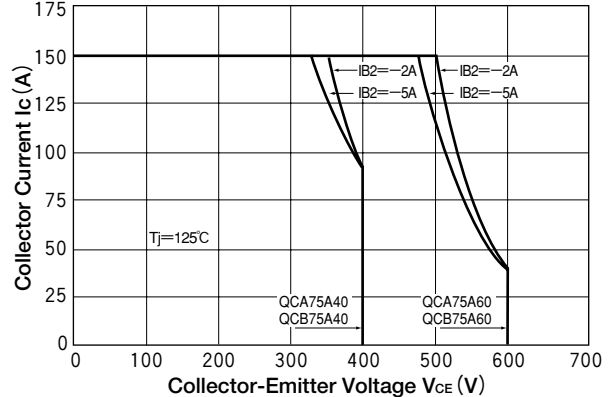
Saturation Characteristics



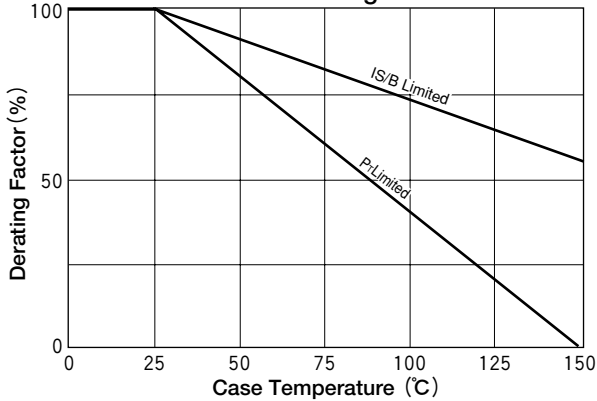
Forward Bias Safe Operating Area



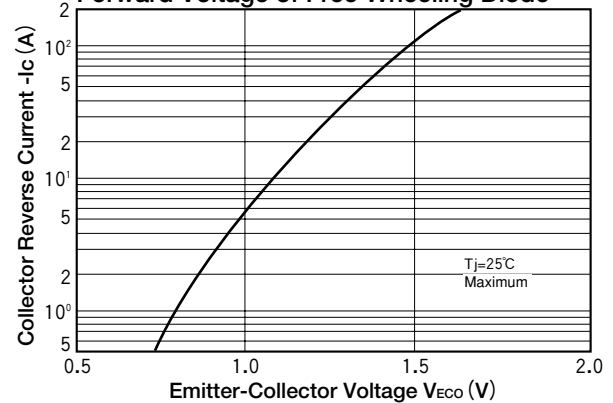
Reverse Bias Safe Operating Area



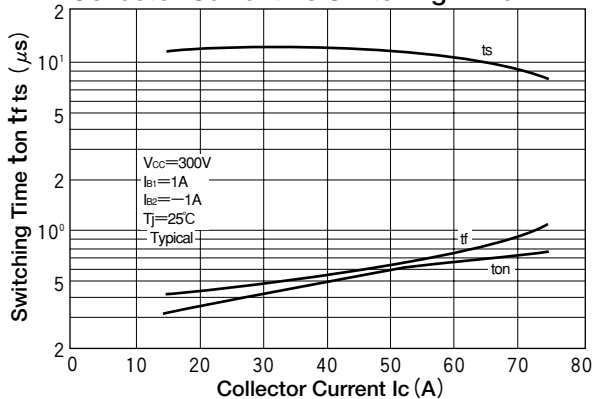
Collector Current Derating Factor



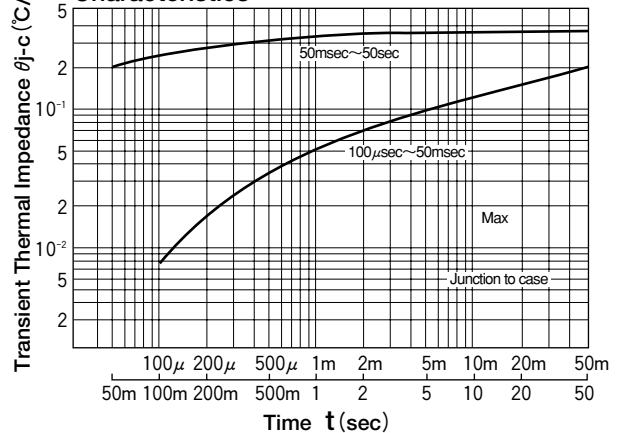
Forward Voltage of Free Wheeling Diode



Collector Current Vs Switching Time



Maximum Transient Thermal Impedance Characteristics



TRANSISTOR MODULE

QCA75AA100



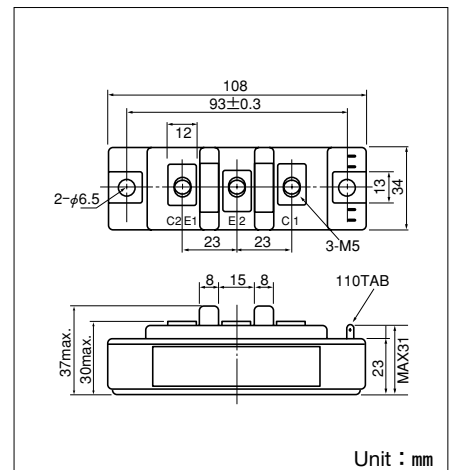
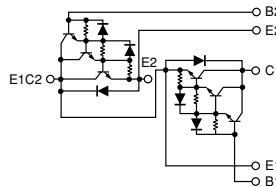
UL;E76102 (M)

QCA75AA100 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=75A$, $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Unit : mm

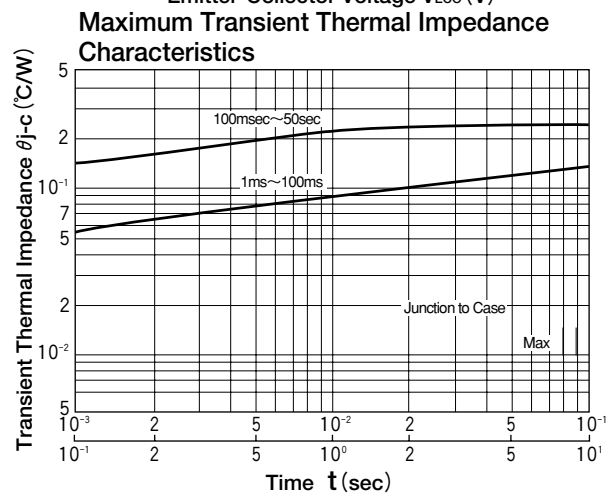
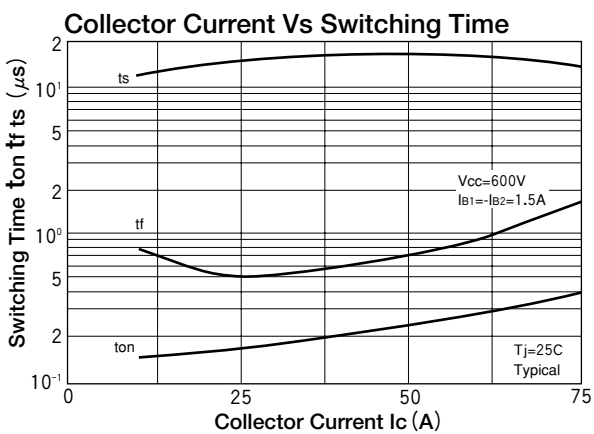
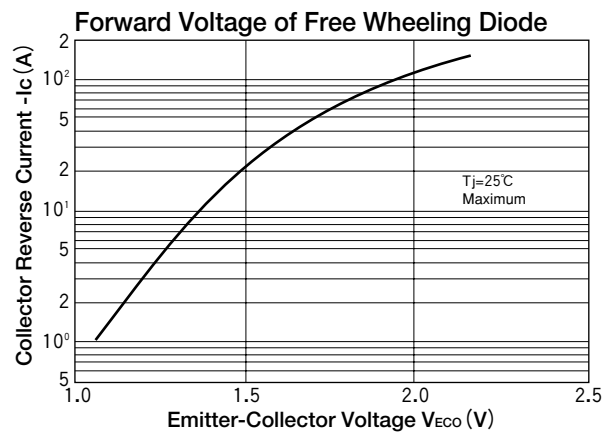
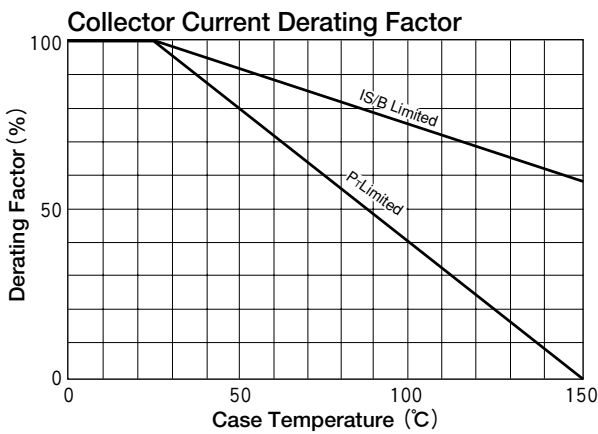
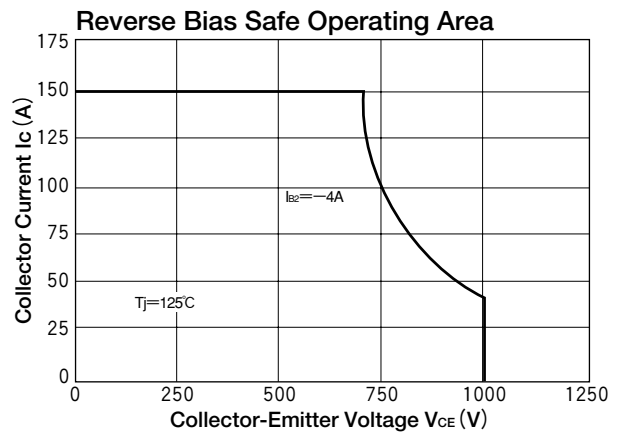
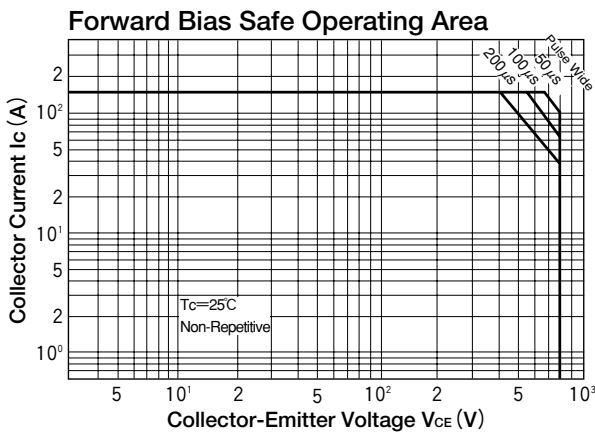
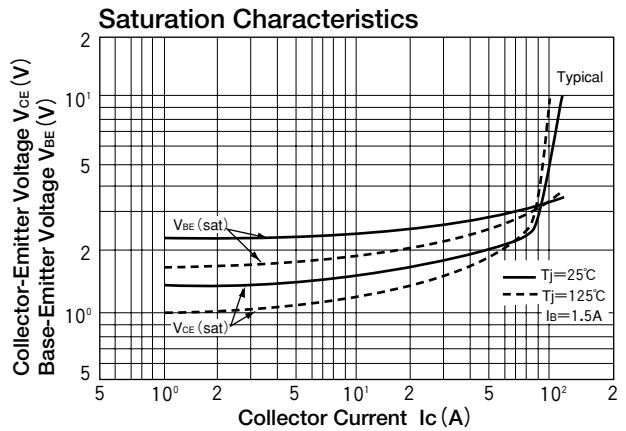
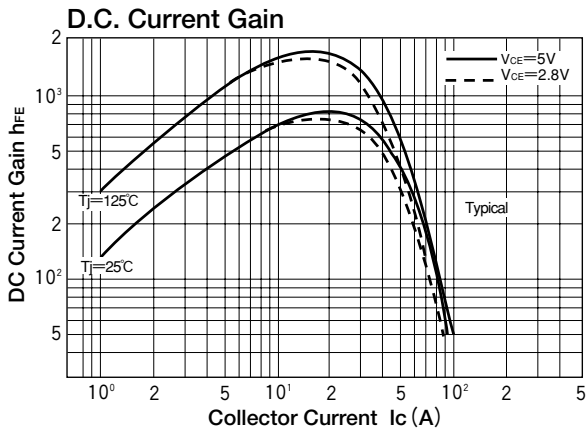
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA75AA100		
V_{CBO}	Collector-Base Voltage		1000		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1000		V
V_{EBO}	Emitter-Base Voltage		7		V
I_C	Collector Current		75		A
$-I_C$	Reverse Collector Current		75		A
I_B	Base Current		4		A
P_T	Total power dissipation	$T_C=25^\circ C$	500		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m kgf·cm
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	250		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=7V$		200	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=15A$, $I_{B2}=-4A$	1000		V
h_{FE}	DC Current Gain	$I_C=75A$, $V_{CE}=2.8V$	75		
		$I_C=75A$, $V_{CE}=5V$	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75A$, $I_B=1.5A$		2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=75A$, $I_B=1.5A$		3.5	V
t_{on}	Switching Time	On Time		2.5	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=75A$ $I_{B1}=1.5A$, $I_{B2}=-1.5A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=75A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.25	$^\circ C/W$
		Diode part		1.20	



TRANSISTOR MODULE

QCA75AA120



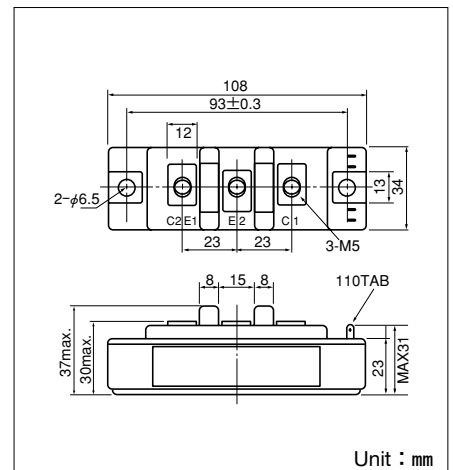
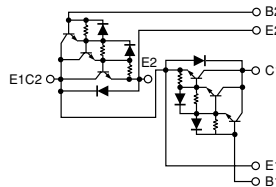
UL;E76102 (M)

QCA75AA120 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=75A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS,
Switching Power Supply, Ultrasonic Application



Unit : mm

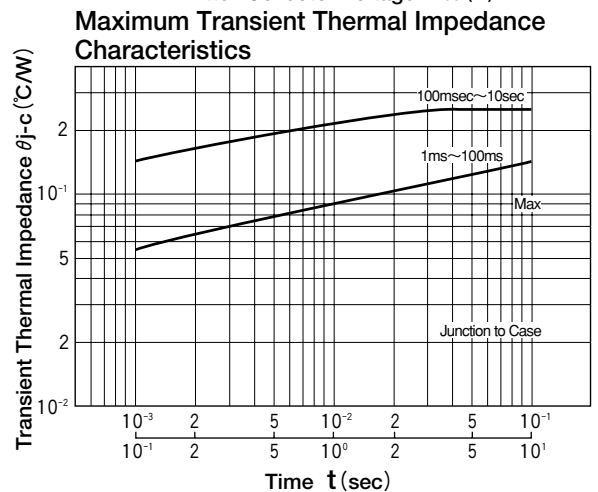
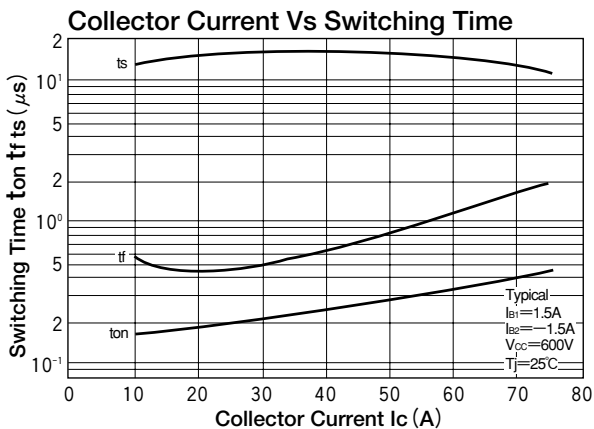
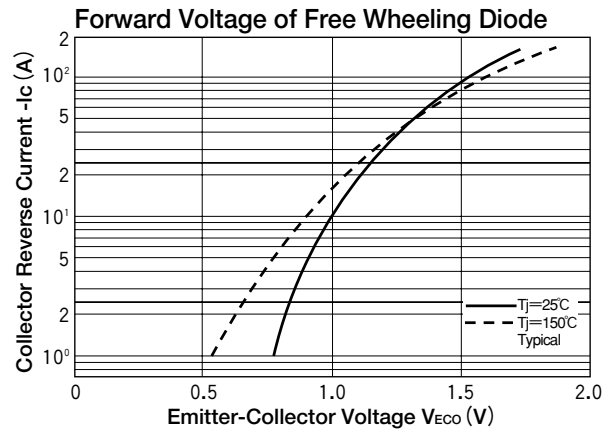
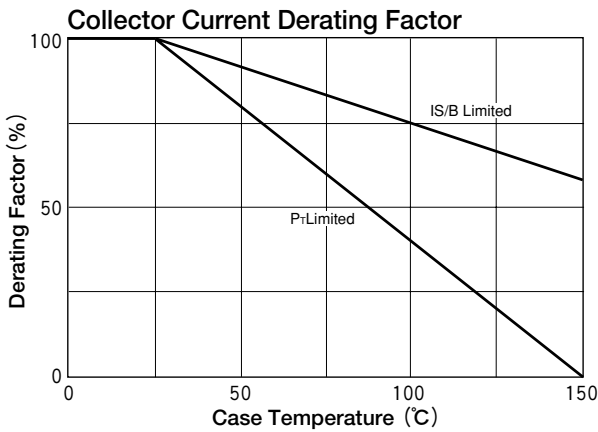
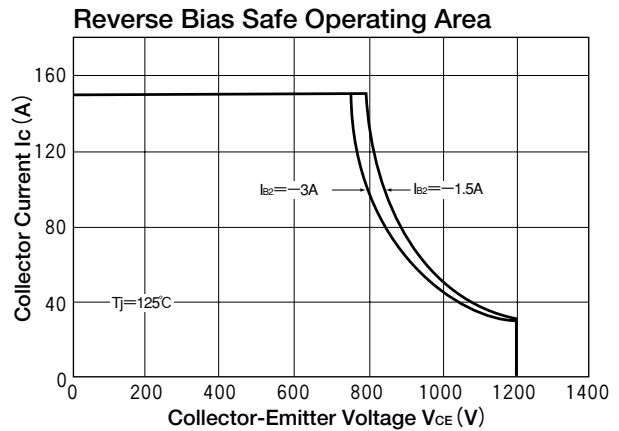
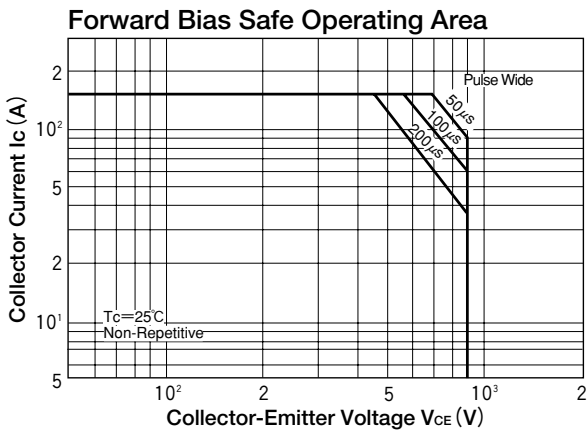
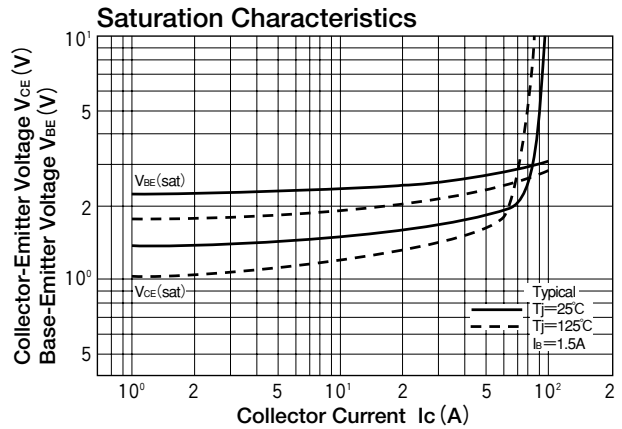
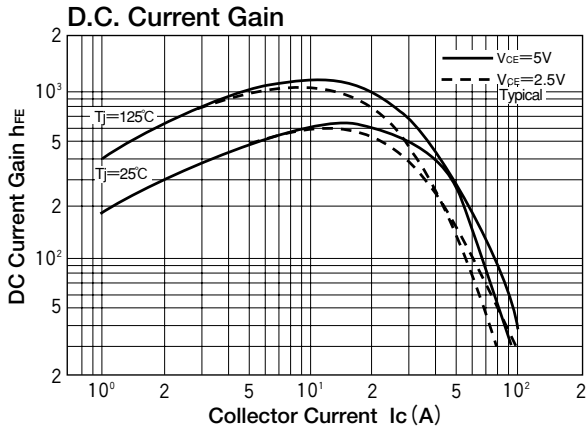
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA75AA120		
V_{CBO}	Collector-Base Voltage		1200		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1200		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current		75		A
$-I_C$	Reverse Collector Current		75		A
I_B	Base Current		4		A
P_T	Total power dissipation	$T_C=25^\circ C$	500		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	250		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1200V$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=10V$		300	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=15A$, $I_{B2}=-3A$	1200		V
h_{FE}	DC Current Gain	$I_C=75A$, $V_{CE}=5V$	75		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75A$, $I_B=1.5A$		3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=75A$, $I_B=1.5A$		3.5	V
t_{on}	Switching Time	On Time		2.5	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=75A$ $I_{B1}=1.5A$, $I_{B2}=-1.5A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=75A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.25	$^\circ C/W$
		Diode part		1.2	



TRANSISTOR MODULE

QCA100A/QBB100A40/60

TOP



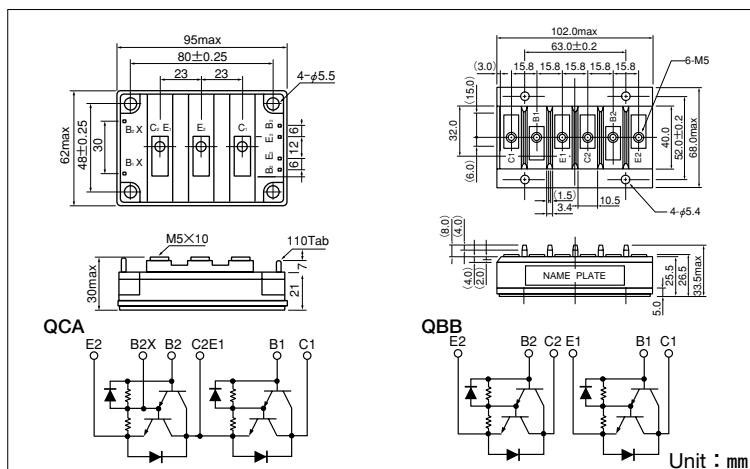
UL;E76102 (M)

QCA100A and QBB100A is a dual Darlington power transistor modules with two high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- QCA100A···Series-connected type
QBB100A···Separate Type
- $I_C=100A$, $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



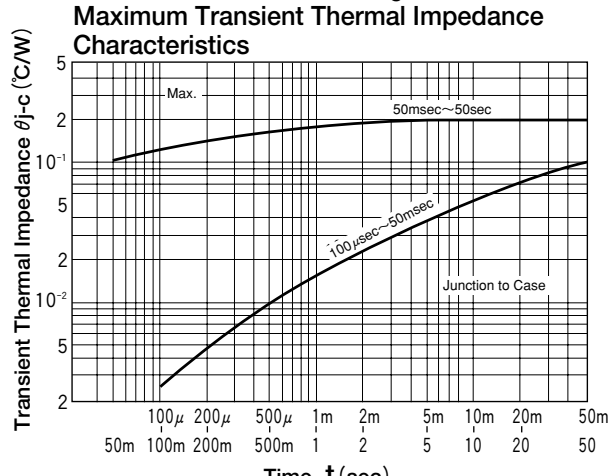
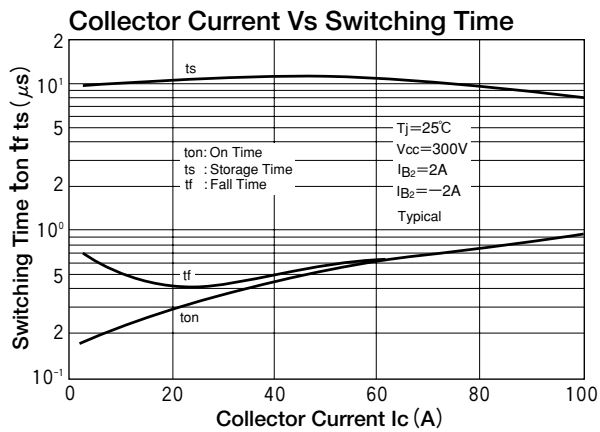
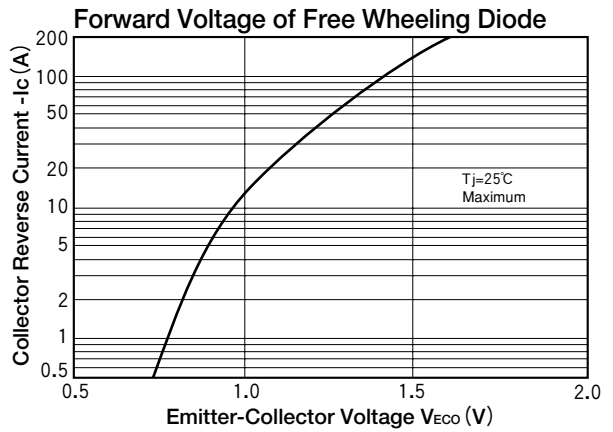
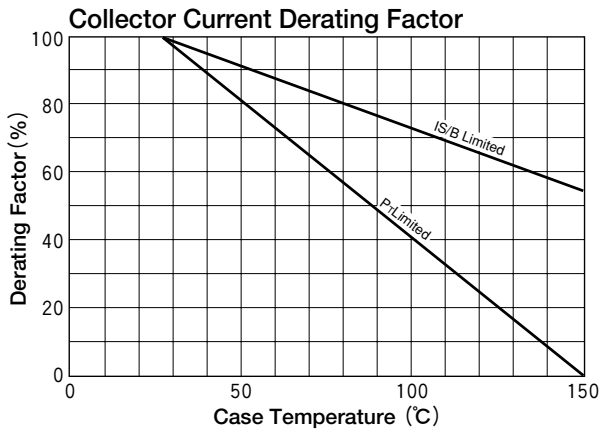
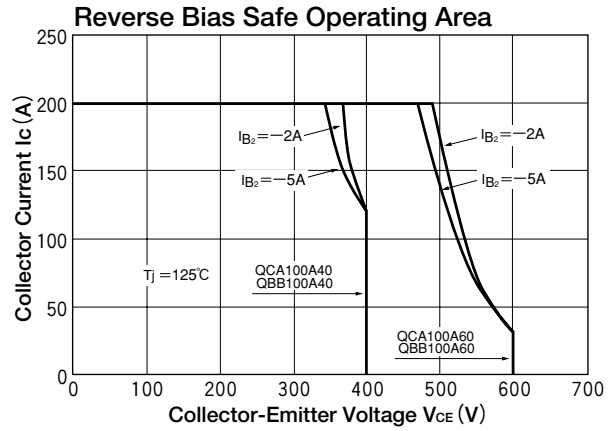
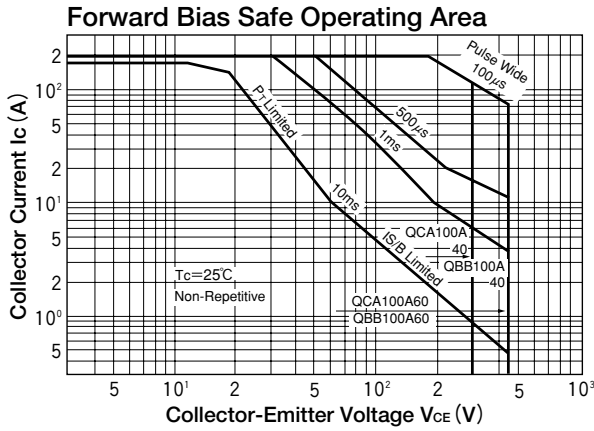
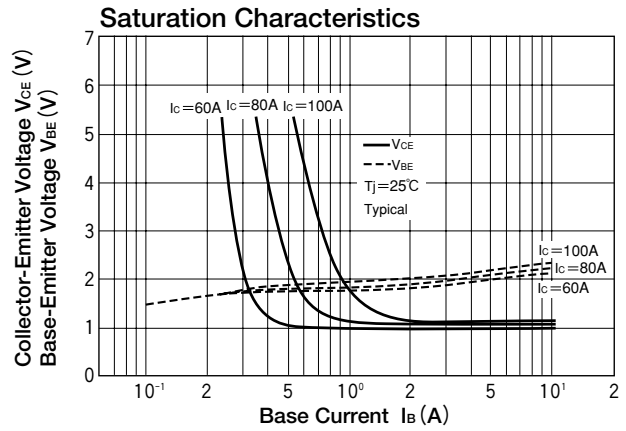
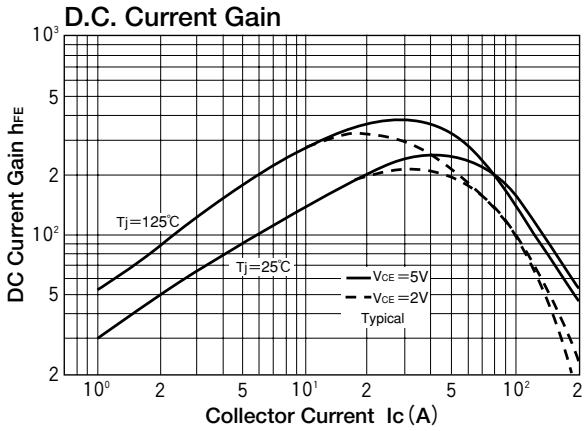
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA100A40 QBB100A40	QCA100A60 QBB100A60	
V_{CBO}	Collector-Base Voltage		400	600	V
V_{CEX}	Collector-Emmitter Voltage	$V_{BE}=-2V$	400	600	V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	100 (200)		A
$-I_C$	Reverse Collector Current		100		A
I_B	Base Current		6		A
P_T	Total power dissipation	$T_C=25^\circ C$	620		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{iso}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	QCA100A/QBB100A	Typical Value		360/340

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$		400	mA
$V_{CEO(SUS)}$	Collector Emmitter Sustaning Voltage	$I_C=1A$	QCA100A40 QBB100A40	300	V
			QCA100A60 QBB100A60	450	
$V_{CEX(SUS)}$		$I_C=20A, I_{B2}=-5A$	QCA100A40 QBB100A40	400	V
			QCA100A60 QBB100A60	600	
h_{FE}	DC Current Gain	$I_C=100A, V_{CE}=2V/5V$	75/100		
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C=100A, I_B=1.4A$		2.0	V
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C=100A, I_B=1.4A$		2.5	V
t_{on}	Switching Time	$V_{CC}=300V, I_C=100A$ $I_{B1}=2A, I_{B2}=-2A$		2.0	μs
t_s				12.0	
t_f				3.0	
V_{ECO}	Collector-Emmitter Reverse Voltage	$-I_C=100A$		1.4	V
$R_{th(j-c)}$	Thermal Impedance	Transistor part/Diode part		0.2/0.6	$^\circ C/W$



TRANSISTOR MODULE

QCA100AA100

TOP



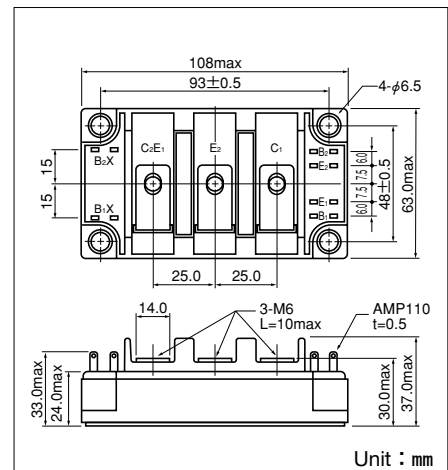
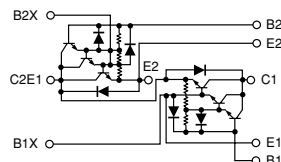
UL;E76102 (M)

QCA100AA100 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=100A$, $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS,
Switching Power Supply, Ultrasonic Application



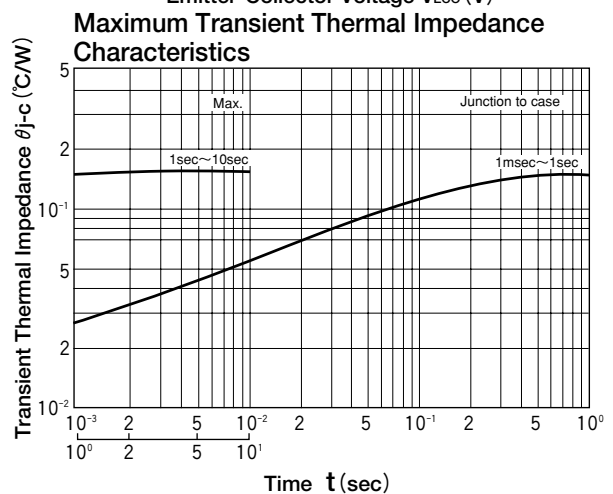
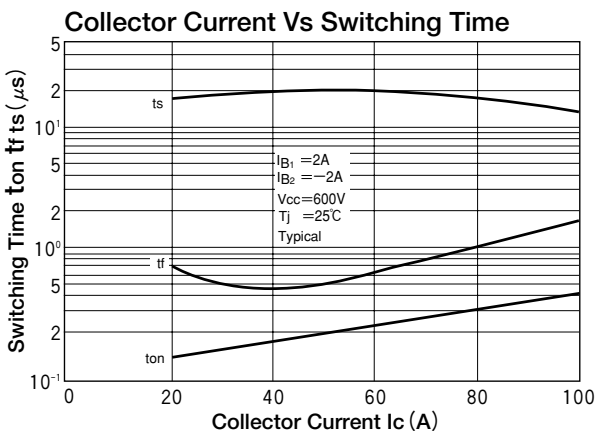
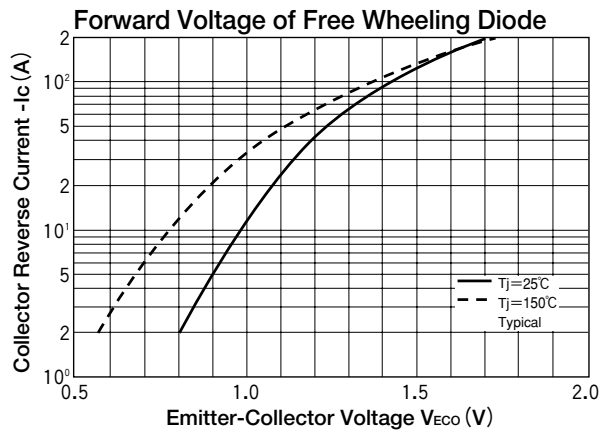
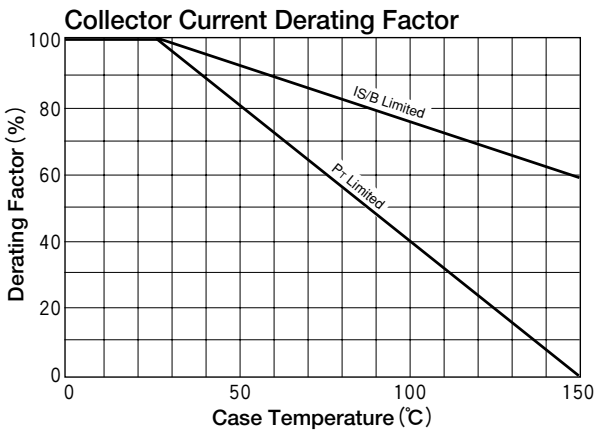
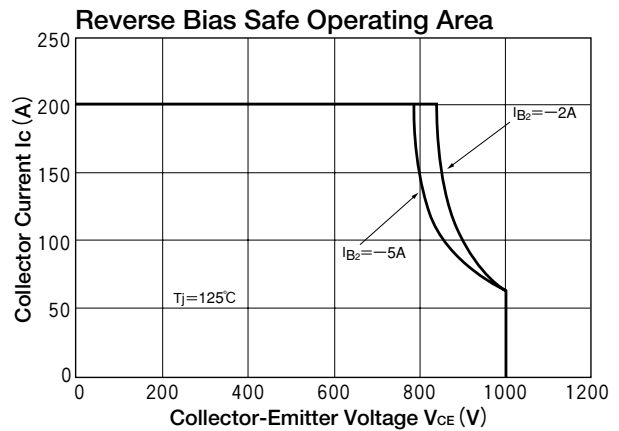
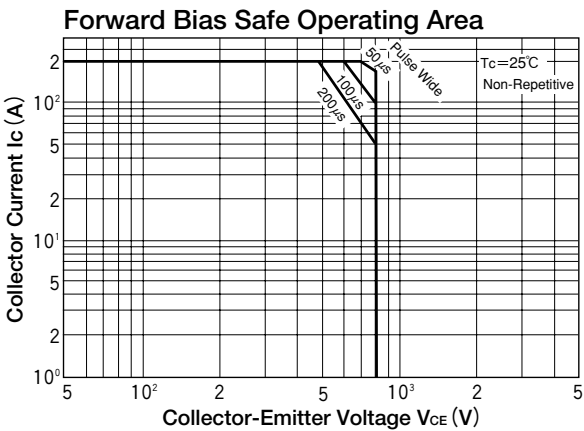
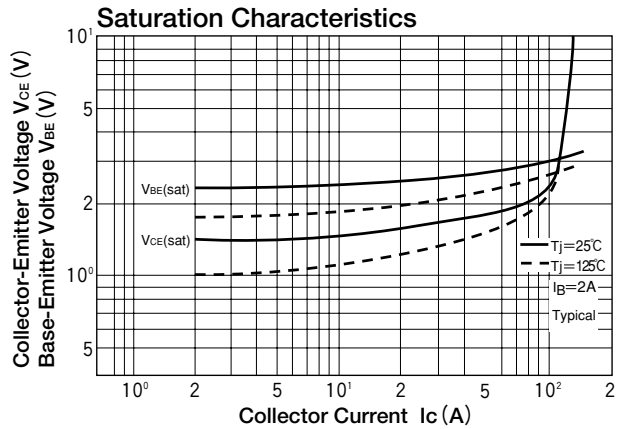
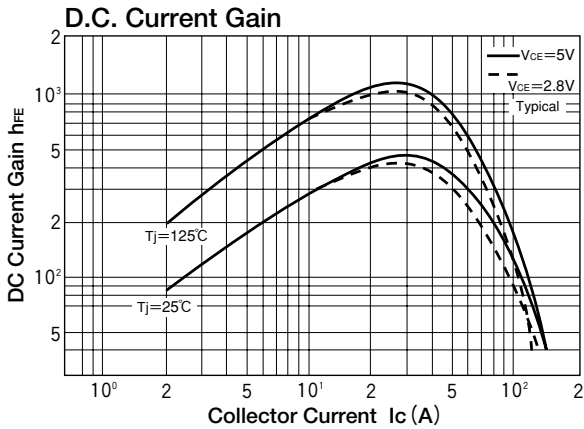
Maximum Ratings

($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA100AA100		
V_{CBO}	Collector-Base Voltage		1000		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1000		V
V_{EBO}	Emitter-Base Voltage		7		V
I_C	Collector Current		100		A
$-I_C$	Reverse Collector Current		100		A
I_B	Base Current		5		A
P_T	Total power dissipation	$T_C=25^\circ\text{C}$	800		W
T_j	Junction Temperature		-40 to +150		$^\circ\text{C}$
T_{stg}	Storage Temperature		-40 to +125		$^\circ\text{C}$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	
	Mass	Typical Value	470		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$		2.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=7V$		400	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=20A$, $I_{B2}=-5A$	1000		V
h_{FE}	DC Current Gain	$I_C=100A$, $V_{CE}=2.8V$	75		
		$I_C=100A$, $V_{CE}=5V$	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100A$, $I_B=2A$		2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=100A$, $I_B=2A$		3.5	V
t_{on}	Switching Time	On Time		3.0	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=100A$ $I_{B1}=2A$, $I_{B2}=-2A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=100A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.155	$^\circ\text{C/W}$
		Diode part		0.65	



TRANSISTOR MODULE

QCA100AA120

TOP



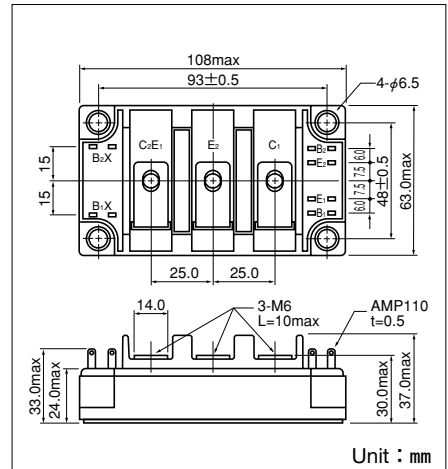
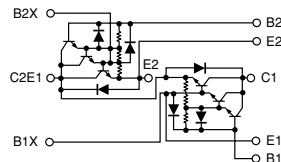
UL;E76102 (M)

QCA100AA120 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=100A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Applicatio



Unit : mm

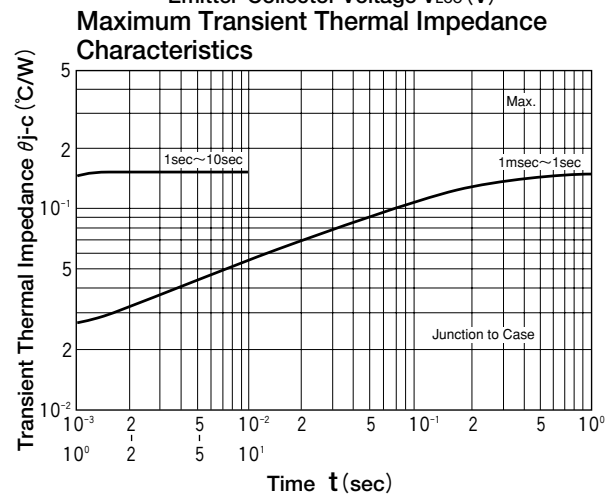
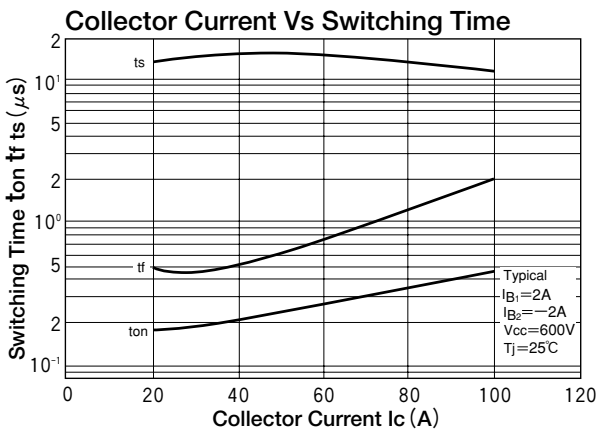
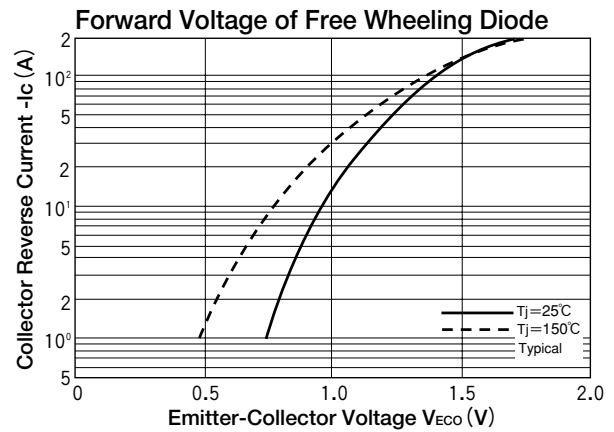
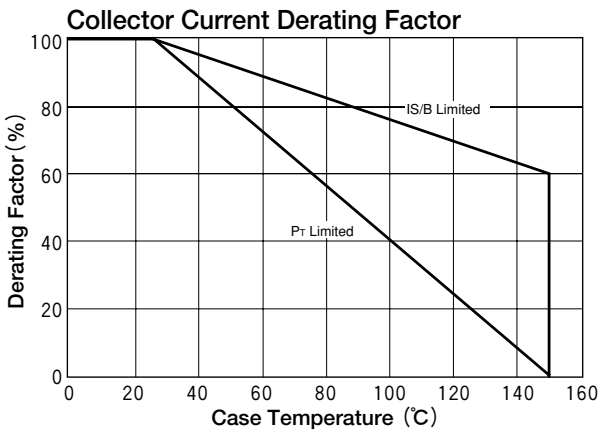
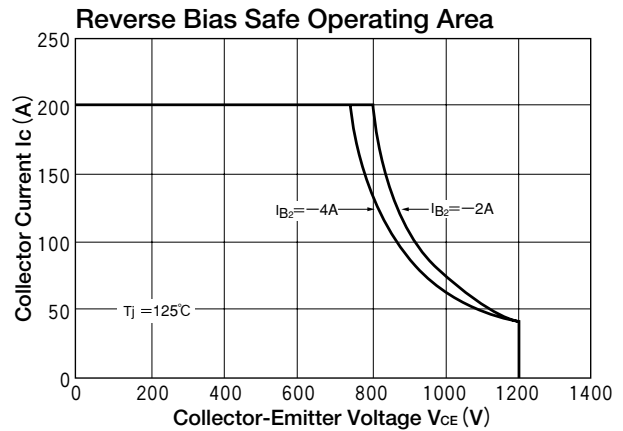
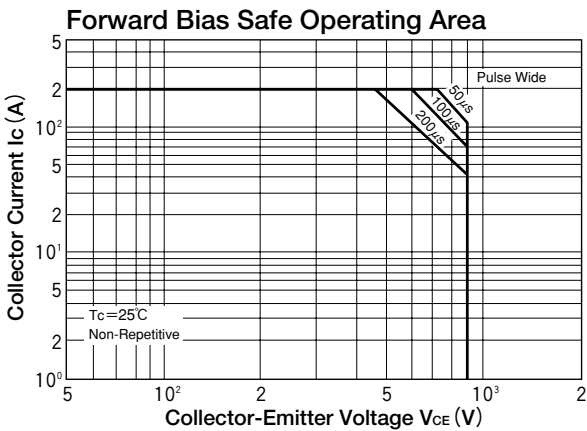
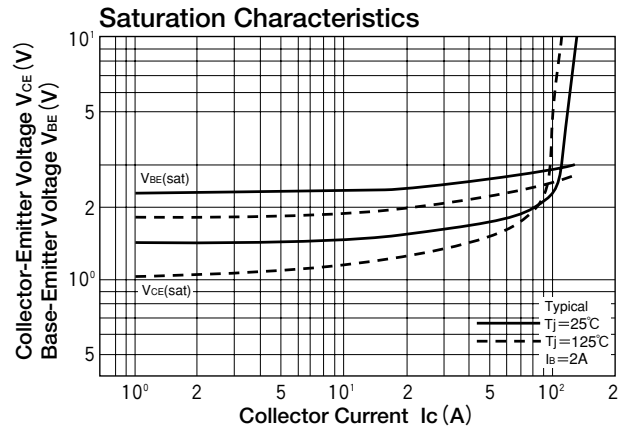
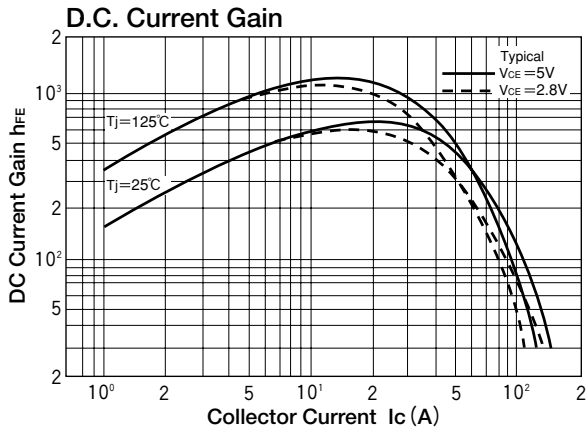
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA100AA120		
V_{CBO}	Collector-Base Voltage		1200		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1200		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current		100		A
$-I_C$	Reverse Collector Current		100		A
I_B	Base Current		5		A
P_T	Total power dissipation	$T_C=25^\circ C$	800		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	
	Mass	Typical Value	470		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1200V$		2.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=10V$		600	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaning Voltage	$I_C=20A$, $I_{B2}=-4A$	1200		V
h_{FE}	DC Current Gain	$I_C=100A$, $V_{CE}=5V$	75		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100A$, $I_B=2A$		3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=100A$, $I_B=2A$		3.5	V
t_{on}	Switching Time	On Time		3.0	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=100A$ $I_{B1}=2A$, $I_{B2}=-2A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=100A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.155	$^\circ C/W$
		Diode part		0.65	



TRANSISTOR MODULE

QCA150A/QBB150A40/60

TOP



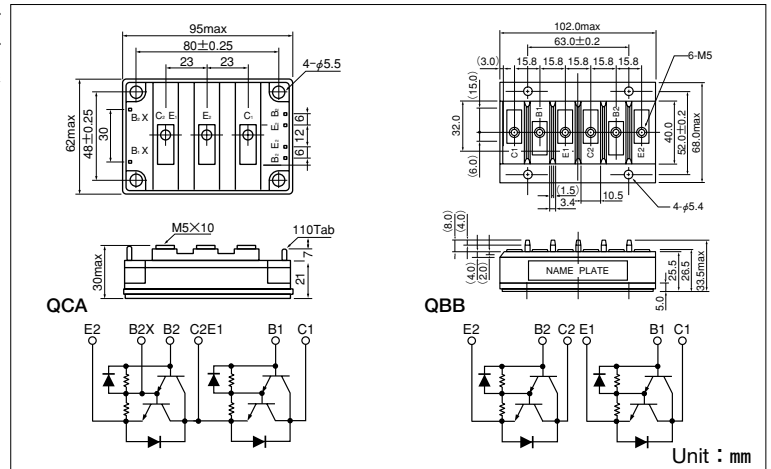
UL;E76102 (M)

QCA150A and QBB150A is a dual Darlington power transistor module with two high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- QCA150A···Series-connected type
QBB150A···Separate Type
- $I_C=150A$, $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VWVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



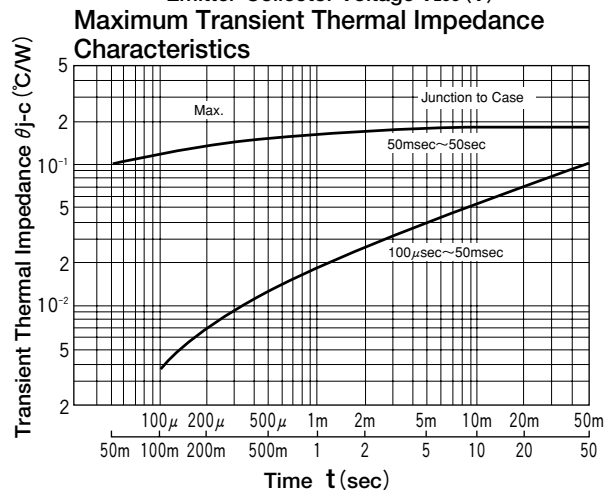
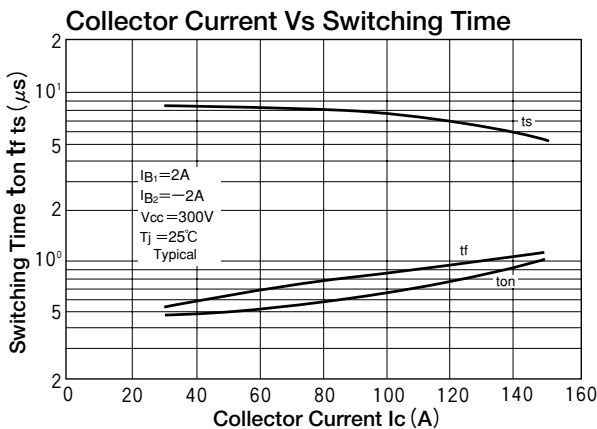
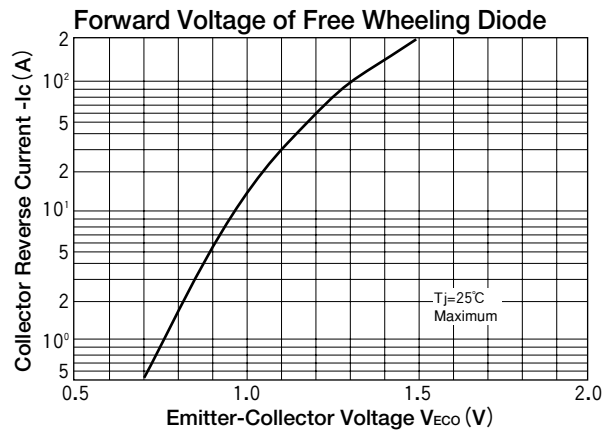
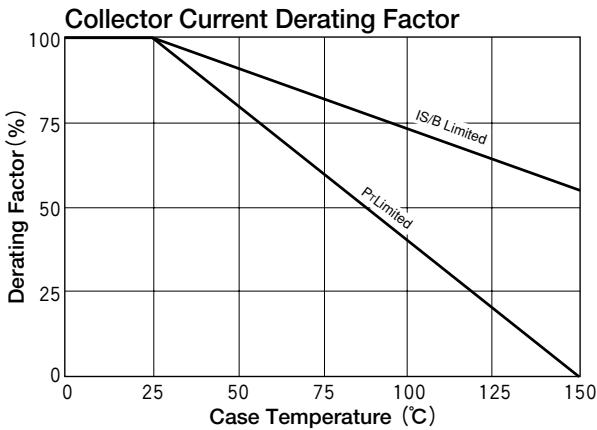
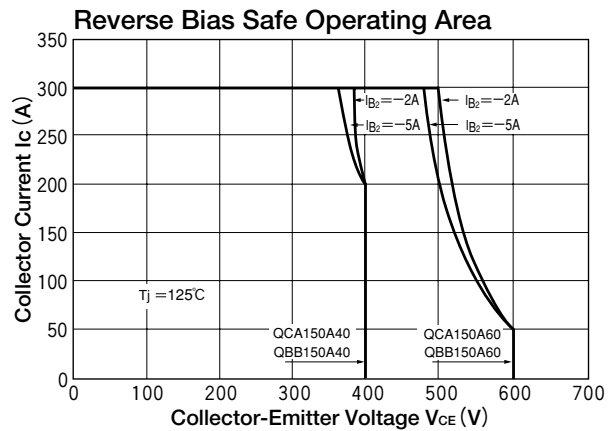
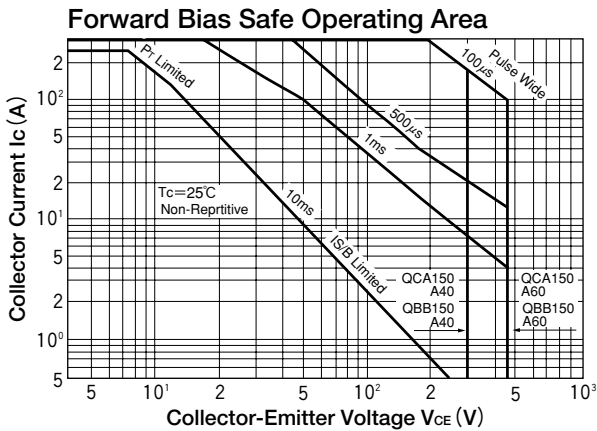
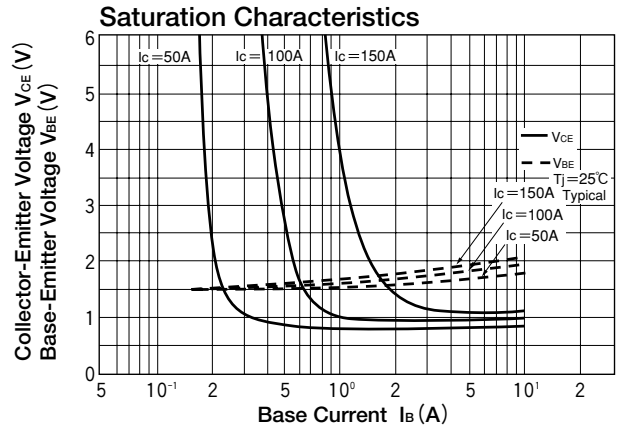
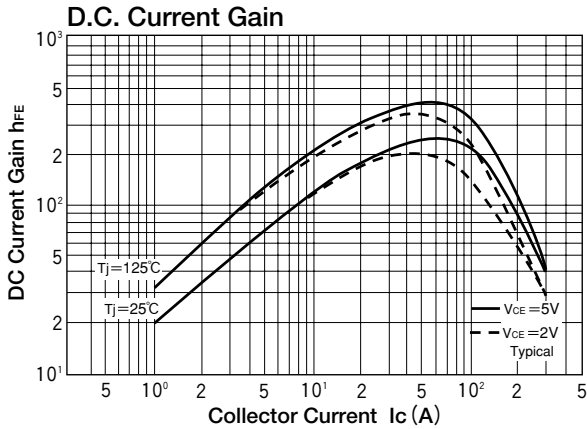
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA150A40 QBB150A40	QCA150A60 QBB150A60	
V_{CBO}	Collector-Base Voltage		400	600	V
V_{CEX}	Collector-Emmitter Voltage	$V_{BE} = -2V$	400	600	V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	150 (300)		A
$-I_C$	Reverse Collector Current		150		A
I_B	Base Current		9		A
P_T	Total power dissipation	$T_C = 25^\circ C$	690		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{iso}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	QCA150A/QBB150A Typical Value	370/340		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit	
			Min.	Max.		
I_{CBO}	Collector Cut-off Current	$V_{CB} = V_{CBO}$		1.0	mA	
I_{EBO}	Emitter Cut-off Current	$V_{EB} = V_{EBO}$		500	mA	
$V_{CEO(SUS)}$	Collector Emmitter Sustaning Voltage	$I_C = 1A$	QCA150A40 QBB150A40	300	V	
			QCA150A60 QBB150A60	450		
$V_{CEX(SUS)}$		$I_C = 30A, I_{B2} = -5A$	QCA150A40 QBB150A40	400	V	
			QCA150A60 QBB150A60	600		
h_{FE}	DC Current Gain	$I_C = 150A, V_{CE} = 2V/5V$	75/100			
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C = 150A, I_B = 2.0A$		2.0	V	
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C = 150A, I_B = 2.0A$		2.5	V	
t_{on}	Switching Time	$V_{CC} = 300V, I_C = 150A$ $I_{B1} = 2A, I_{B2} = -2A$		2.0	μs	
t_s			Storage Time			12.0
t_f			Fall Time			3.0
V_{ECO}	Collector-Emmitter Reverse Voltage	$-I_C = 150A$		1.4	V	
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part/Diode part		0.18/0.6	$^\circ C/W$	



TRANSISTOR MODULE

QCA150AA100

TOP



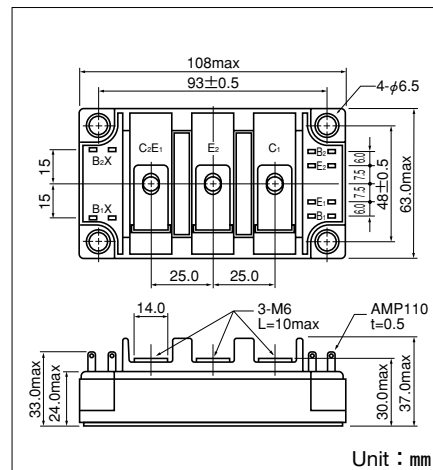
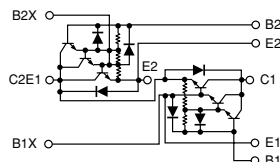
UL;E76102 (M)

QCA150AA100 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=150A$, $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Unit : mm

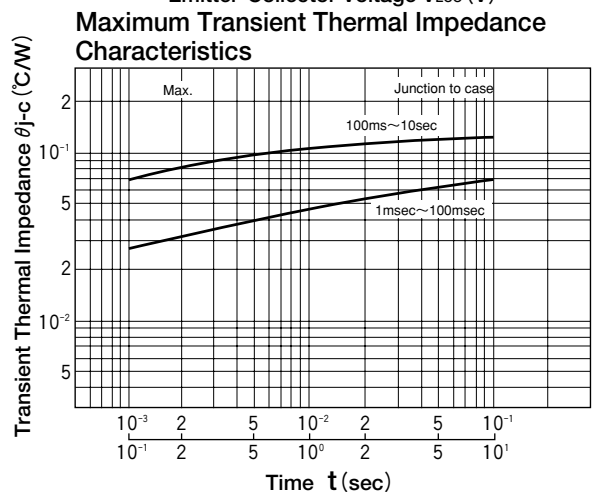
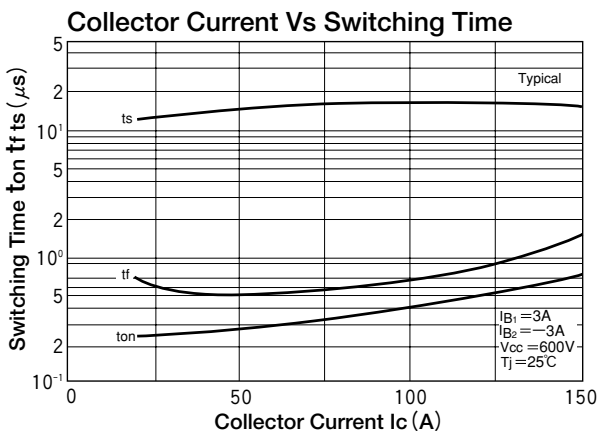
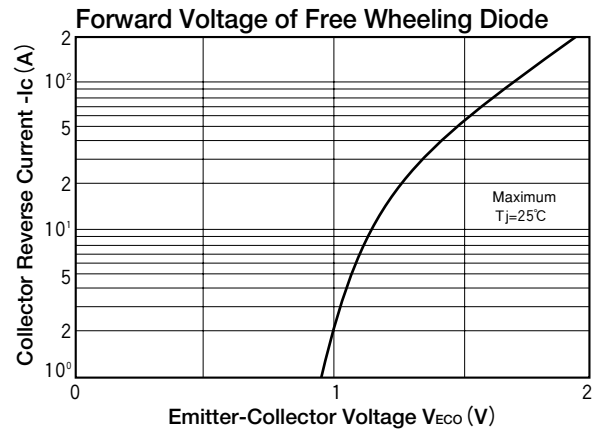
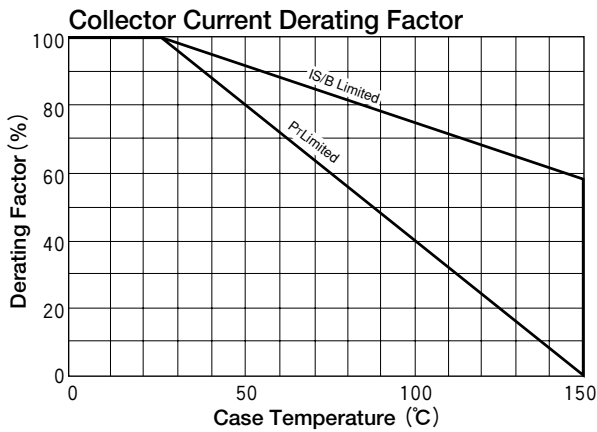
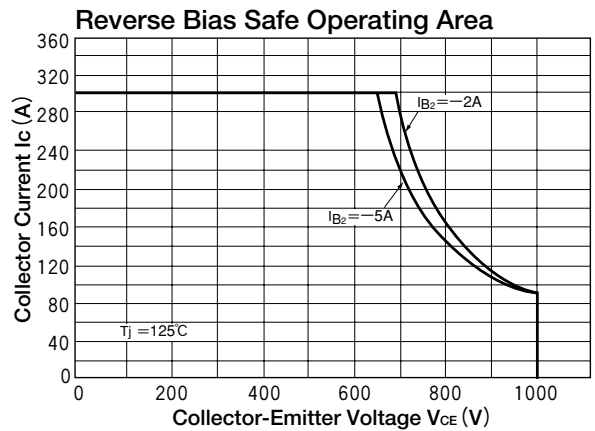
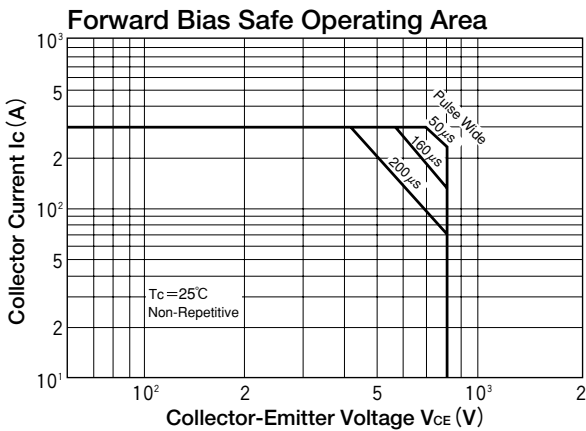
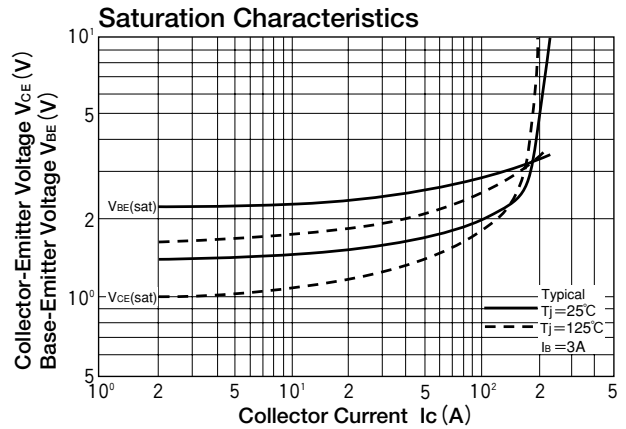
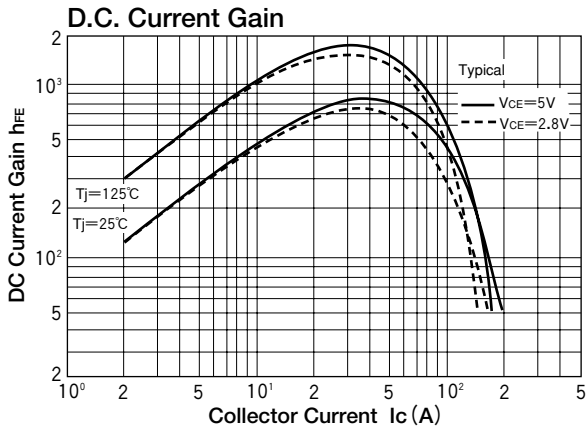
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA150AA100		
V_{CBO}	Collector-Base Voltage		1000		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1000		V
V_{EBO}	Emitter-Base Voltage		7		V
I_C	Collector Current		150		A
$-I_C$	Reverse Collector Current		150		A
I_B	Base Current		8		A
P_T	Total power dissipation	$T_C=25^\circ C$	1000		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	
	Mass	Typical Value	540		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$		1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=7V$		400	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=30A$, $I_{B2}=-5A$	1000		V
h_{FE}	DC Current Gain	$I_C=150A$, $V_{CE}=2.8V$	75		
		$I_C=150A$, $V_{CE}=5V$	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150A$, $I_B=3A$		2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=150A$, $I_B=3A$		3.5	V
t_{on}	Switching Time	On Time		3.0	μs
t_s		Storage Time	$V_{CC}=600V$, $I_C=150A$ $I_{B1}=3A$, $I_{B2}=-3A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=150A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.125	$^\circ C/W$
		Diode part		0.6	



TRANSISTOR MODULE

QCA150AA120

TOP



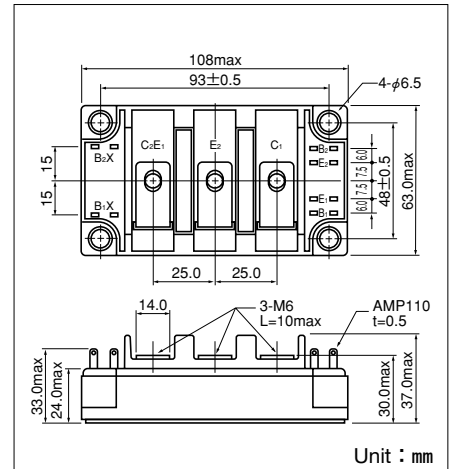
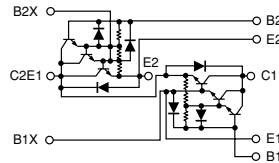
UL;E76102 (M)

QCA150AA120 is a dual Darlington power transistor module which has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=150A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



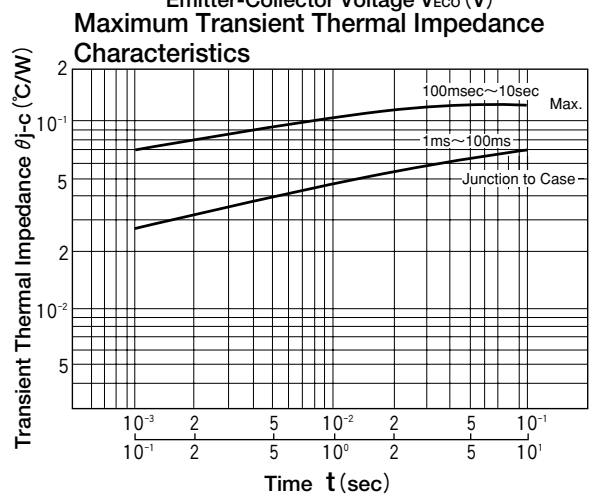
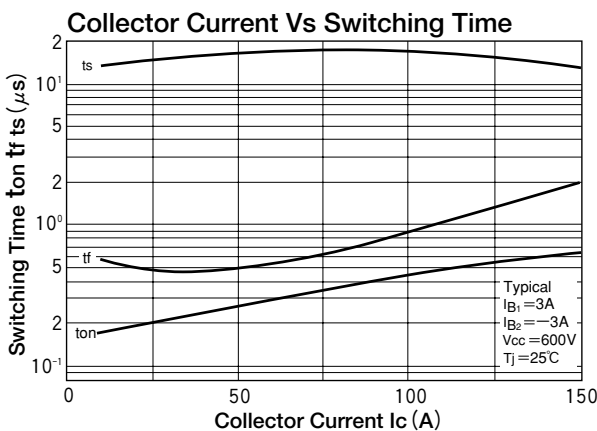
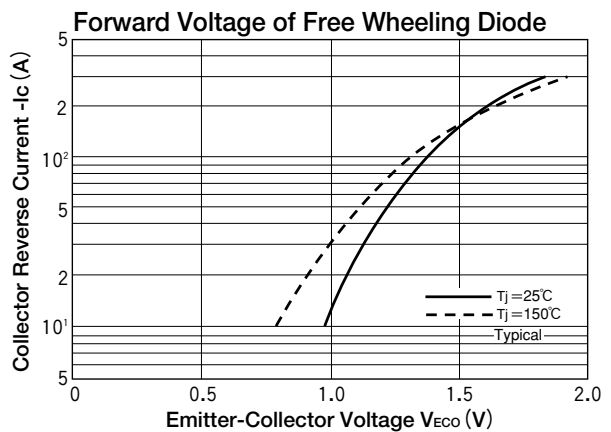
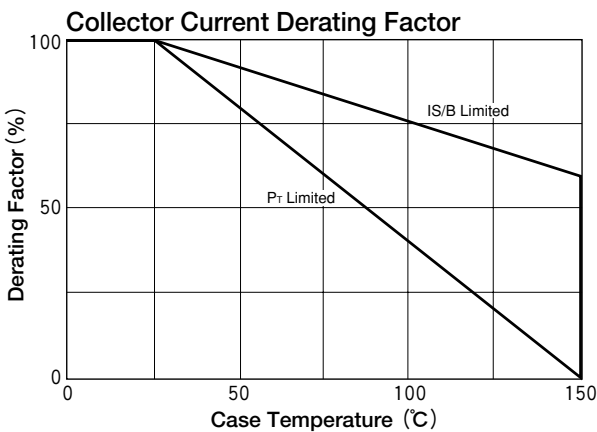
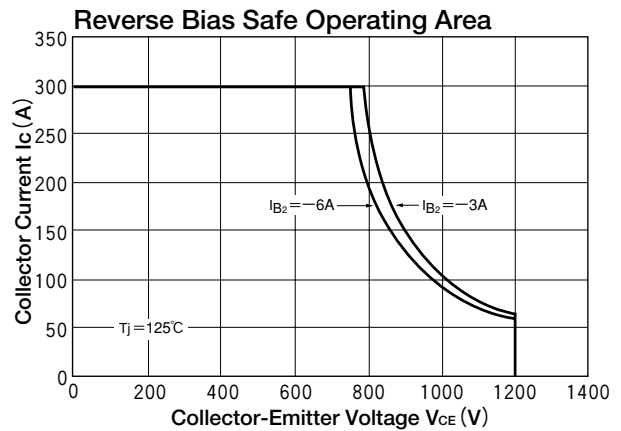
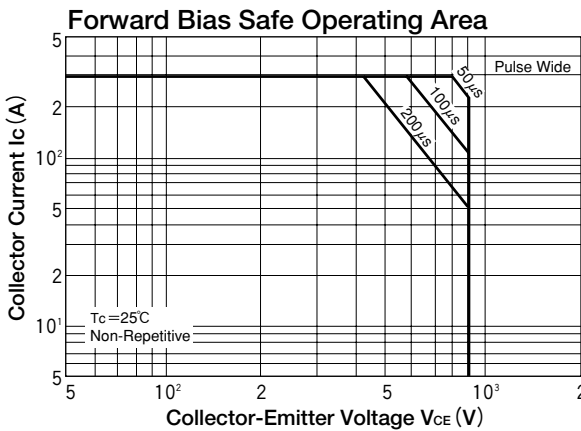
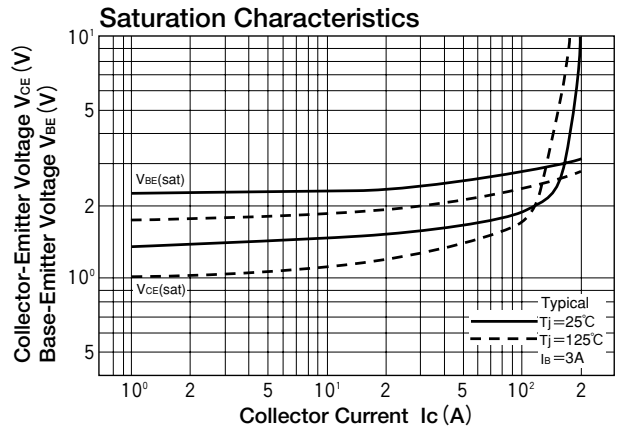
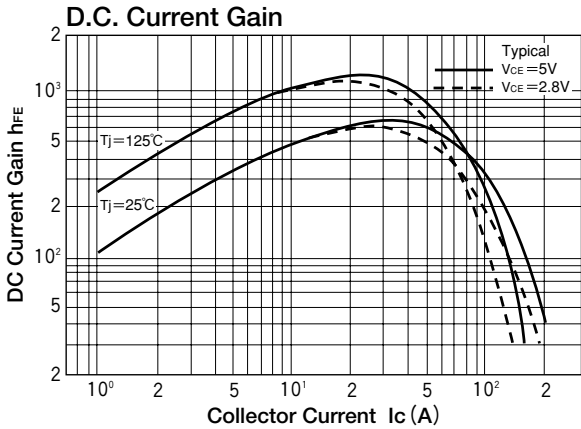
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA150AA120		
V_{CBO}	Collector-Base Voltage		1200		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1200		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current		150		A
$-I_C$	Reverse Collector Current		150		A
I_B	Base Current		8		A
P_T	Total power dissipation	$T_C=25^\circ C$	1000		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	
	Mass	Typical Value	470		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1200V$		2.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=10V$		600	mA
$V_{CEX(SUS)}$	Collector Emitter Sustaning Voltage	$I_C=30A, I_{B2}=-6A$	1200		V
h_{FE}	DC Current Gain	$I_C=150A, V_{CE}=5V$	75		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150A, I_B=3A$		3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=150A, I_B=3A$		3.5	V
t_{on}	Switching Time	On Time		3.0	μs
t_s		Storage Time	$V_{CC}=600V, I_C=150A$ $I_{B1}=3A, I_{B2}=-3A$	15.0	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=150A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.125	$^\circ C/W$
		Diode part		0.6	



TRANSISTOR MODULE

QCA200A40/60

TOP



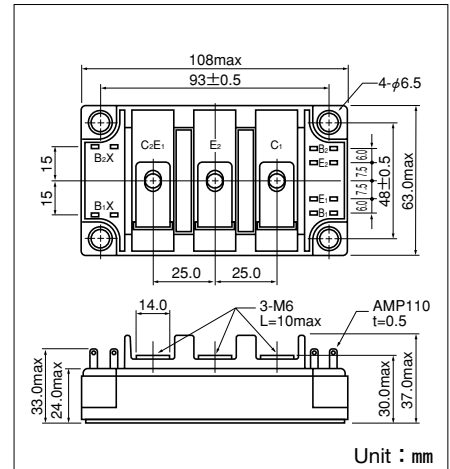
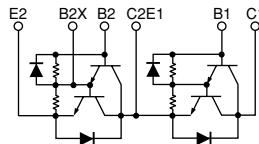
UL;E76102 (M)

QCA200 is a dual Darlington power transistor module which has series- connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=200A$ 、 $V_{CEX}=400/600V$
- Low saturation voltage for higher efficiency.
- High DC current gain h_{FE}
- Isolated mounting base
- V_{EBO} 10V for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



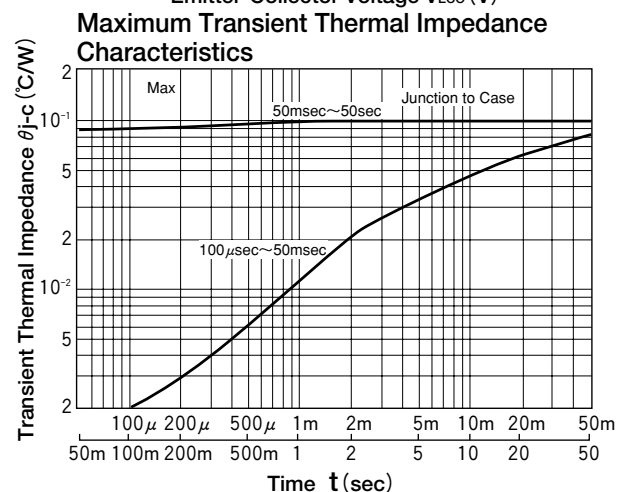
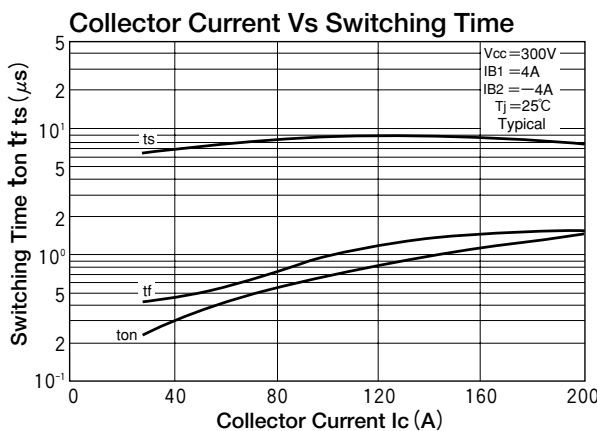
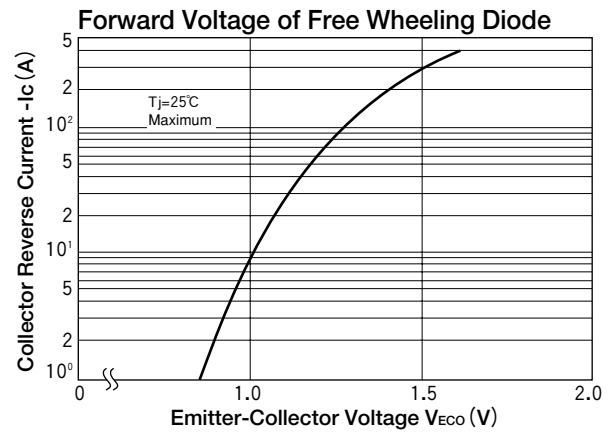
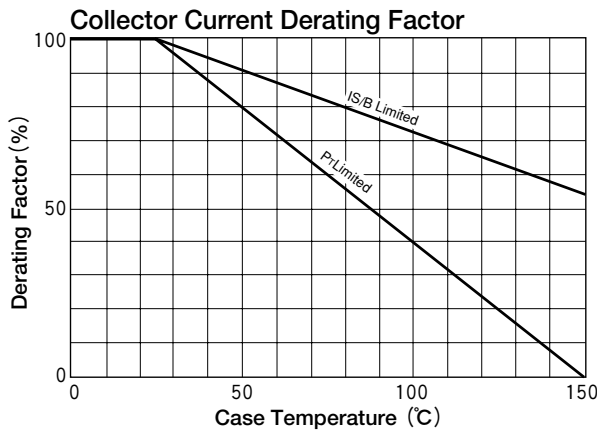
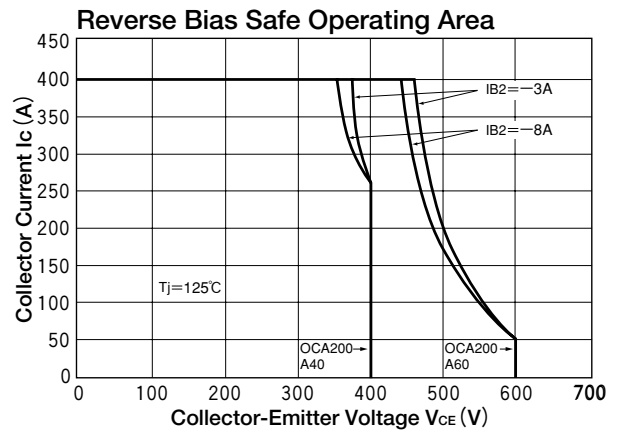
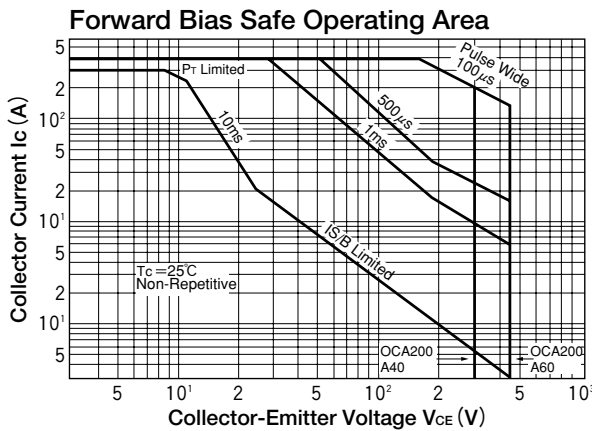
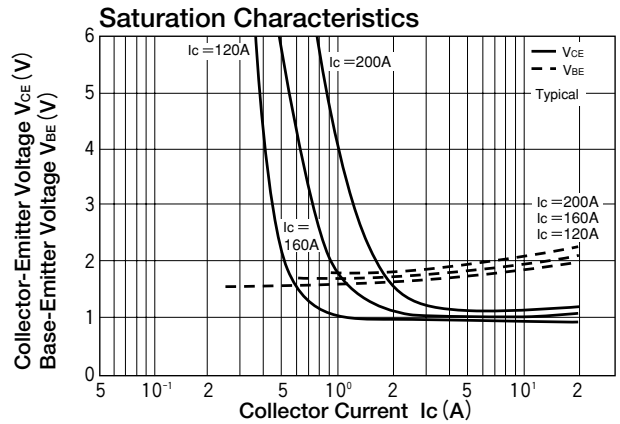
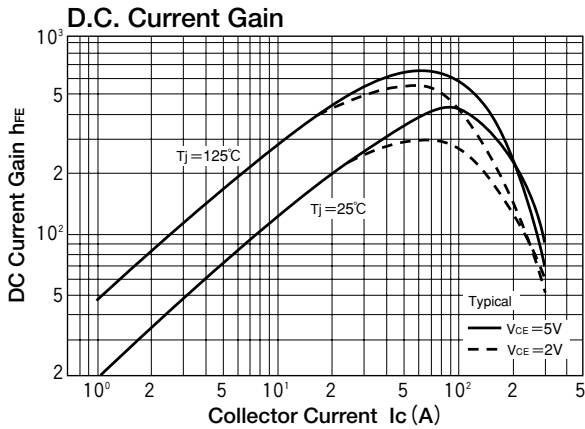
Maximum Ratings

($T_j=25^{\circ}C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA200A40	QCA200A60	
V_{CBO}	Collector-Base Voltage		400	600	V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	400	600	V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	200 (400)		A
$-I_C$	Reverse Collector Current		200		A
I_B	Base Current		12		A
P_T	Total power dissipation	$T_C=25^{\circ}C$	1250		W
T_j	Junction Temperature		-40 to +150		$^{\circ}C$
T_{stg}	Storage Temperature		-40 to +125		$^{\circ}C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)		N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)		
	Mass	Typical Value	470		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit	
			Min.	Max.		
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$		2.0	mA	
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$		800	mA	
$V_{CEO(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=1A$	QCA200A40	300	V	
			QCA200A60	450		
$V_{CEX(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=40A, I_{B2}=-8A$	QCA200A40	400	V	
			QCA200A60	600		
h_{FE}	DC Current Gain	$I_C=200A, V_{CE}=2V$	75			
		$I_C=200A, V_{CE}=5V$	100			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=200A, I_B=2.7A$		2.0	V	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=200A, I_B=2.7A$		2.5	V	
t_{on}	Switching Time	$V_{CC}=300V, I_C=200A, I_{B1}=4A, I_{B2}=-4A$		2.0	μs	
t_s			Storage Time			12.0
t_f			Fall Time			3.0
V_{ECO}	Collector-Emitter Reverse Voltage	$-I_C=200A$		1.4	V	
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part		0.1	$^{\circ}C/W$	
		Diode part		0.3		



TRANSISTOR MODULE

QCA200AA100



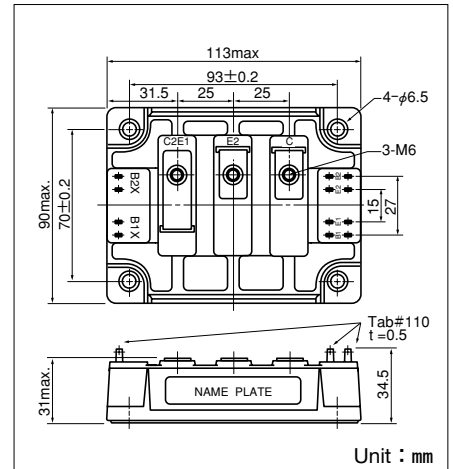
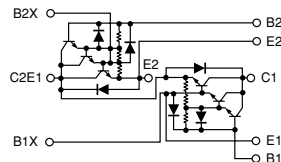
UL;E76102 (M)

QCA200AA100 is a dual Darlington power transistor module with has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=200A$, $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency
- High DC current gain h_{FE}
- Isolated monuting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



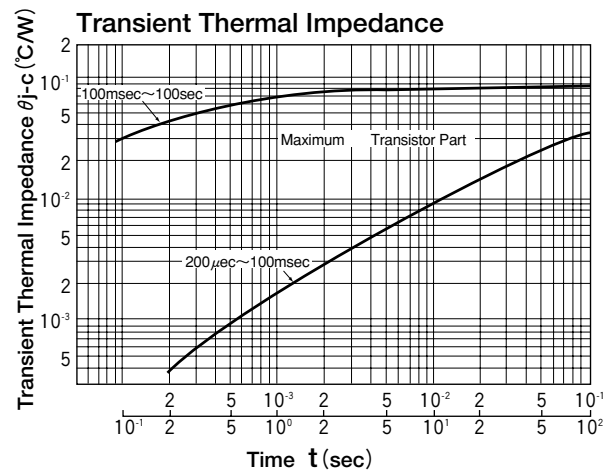
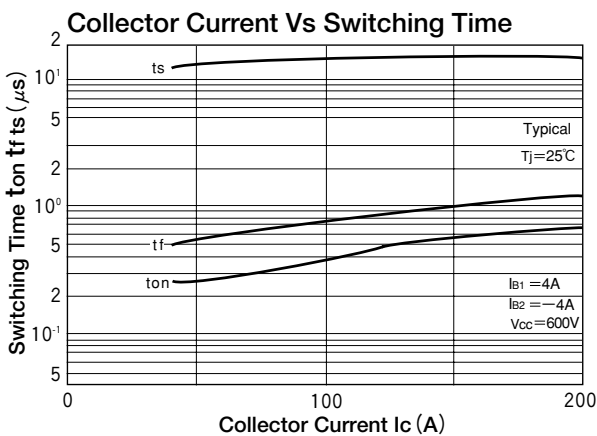
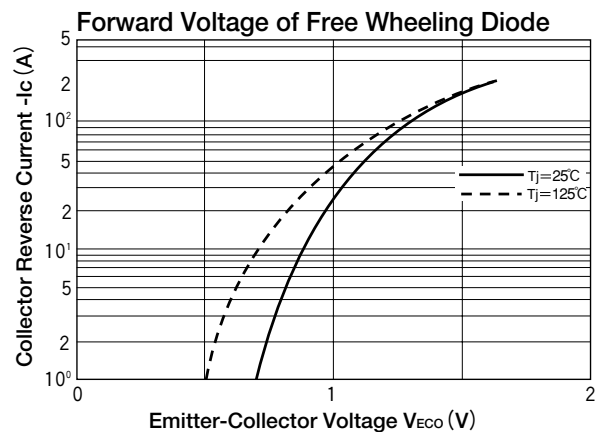
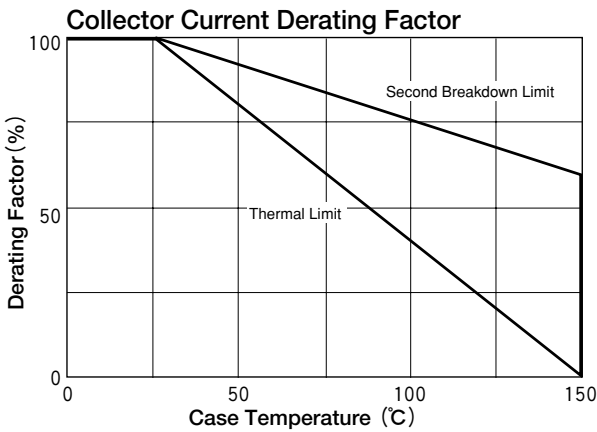
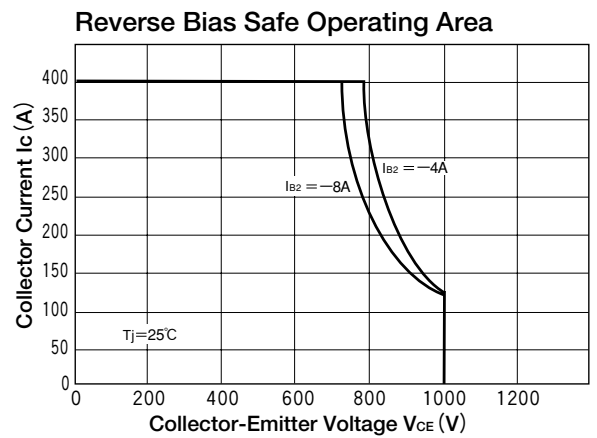
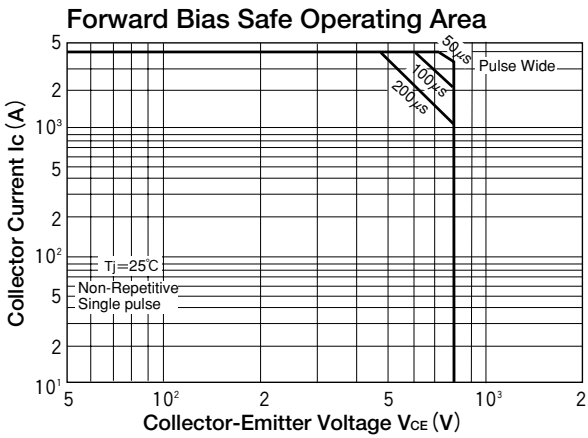
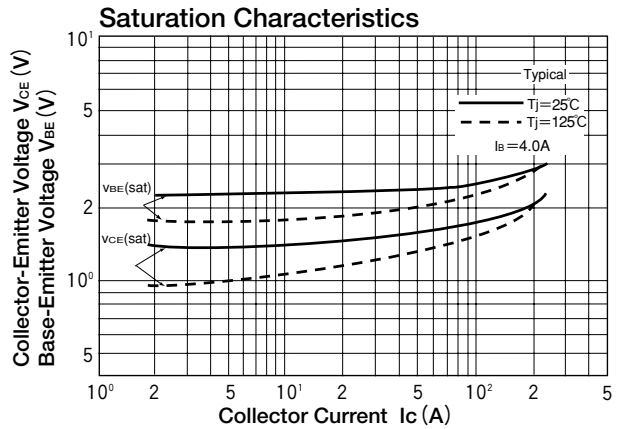
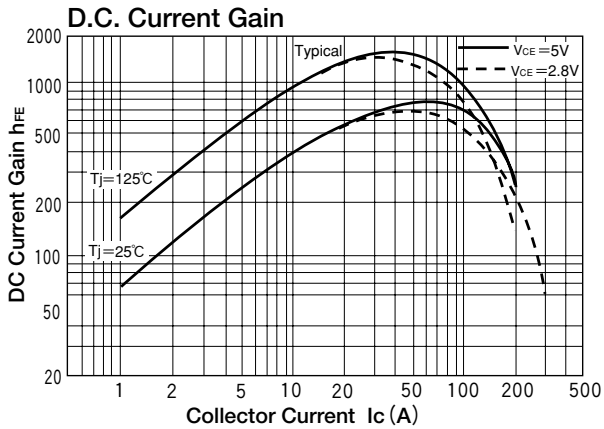
Maximum Ratings

($T_j=25^{\circ}C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings	
			QCA200AA100	Unit
V_{CBO}	Collector-Base Voltage	Emitter open	1000	V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1000	V
$V_{CEX(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C=40A$, $I_{B2}=-5A$	1000	V
V_{EBO}	Emitterr-Base Voltage	Collector open	10	V
I_C	Collector Current		200	A
$-I_C$	Reverse Collector Current		200	A
I_B	Base Current		10	A
P_C	Collector-Emitter power dissipation	$T_C=25^{\circ}C$	1560	W
T_j	Junction Temperature		-40 to 150	$^{\circ}C$
T_{stg}	Storage Temperature		-40 to 125	$^{\circ}C$
V_{iso}	Isolation Voltage(RMS)	A.C. 1minute	2500	V
	Mounting Torque (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
	Mass	Typical Value	675	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$ Emitter open		4.00	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=10V$ Collector open		500	mA
h_{FE}	D.C. Current Gain	$I_C=200A$, $V_{CE}=2.8V$	75		
		$I_C=200A$, $V_{CE}=5V$	100		
$V_{CE(sat)}$	Collector-Emitter Sturation Voltage	$I_C=200A$, $I_B=4A$		2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=200A$, $I_B=4A$		3.5	V
t_{on}	Switching Time	$V_{CC}=600V$, $I_C=200A$ $I_{B1}=4A$, $I_{B2}=-4A$		3.0	μs
t_{stg}				15.0	
t_f				3.0	
V_{ECO}	Collector-Emitter Reverse Voltage (Diode forward voltage drop)	$-I_C=200A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (Junction to case)	Transistor part		0.08	$^{\circ}C/W$
		Diode part		0.35	



TRANSISTOR MODULE

QCA200AA120

TOP



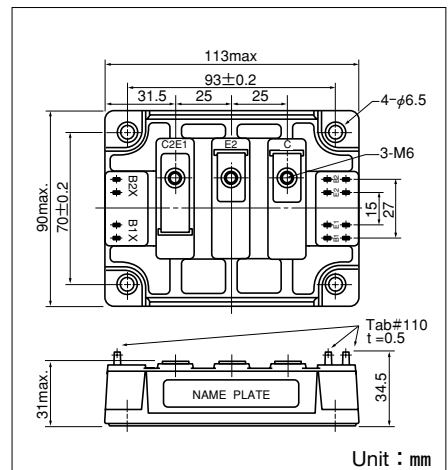
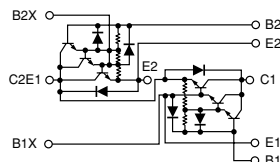
UL;E76102 (M)

QCA200AA120 is a dual Darlington power transistor module with has series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=200A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency
- High DC current gain h_{FE}
- Isolated monuting base

(Applications)

Motor Control (VVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Unit : mm

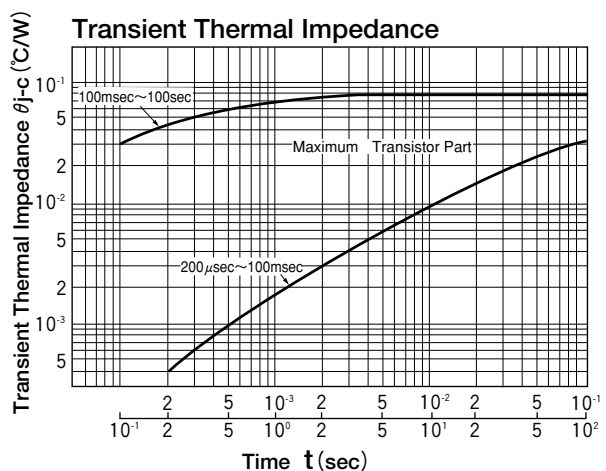
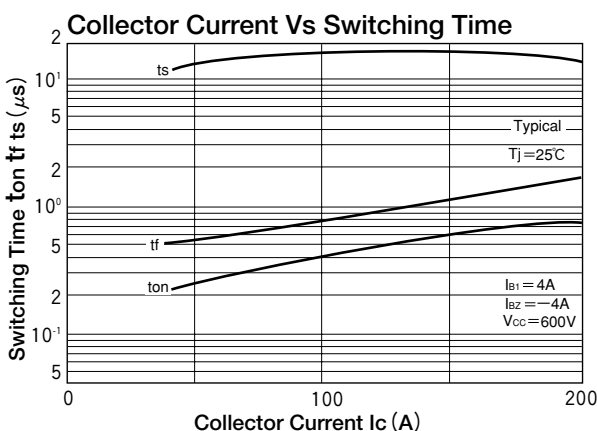
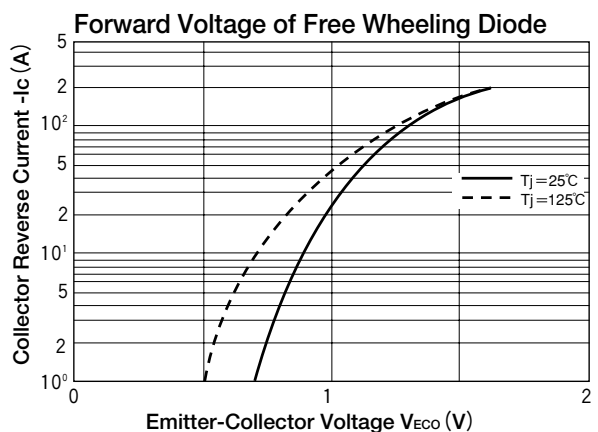
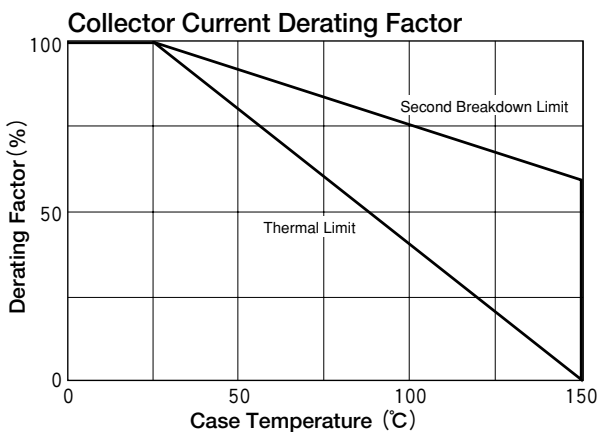
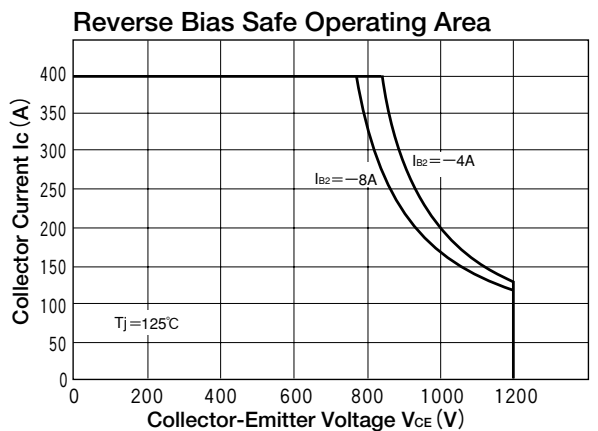
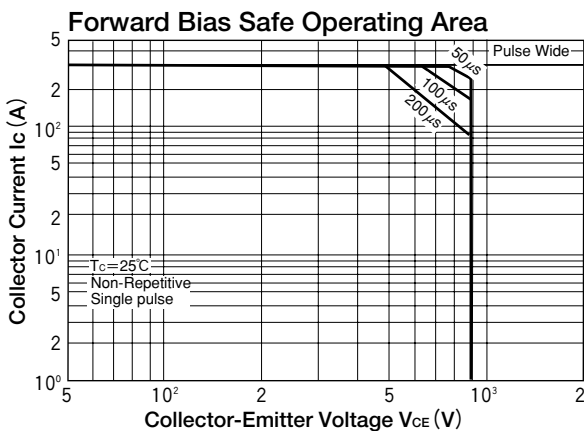
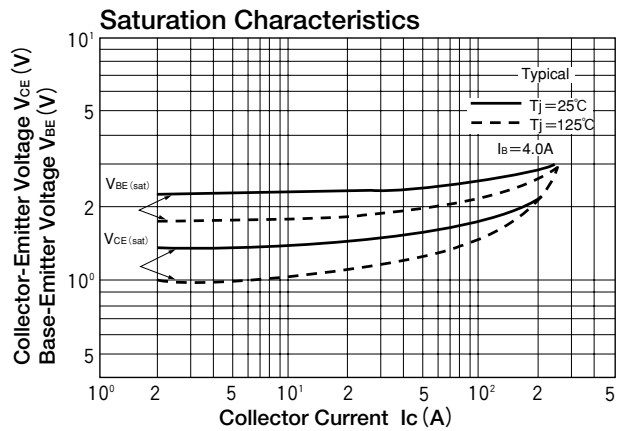
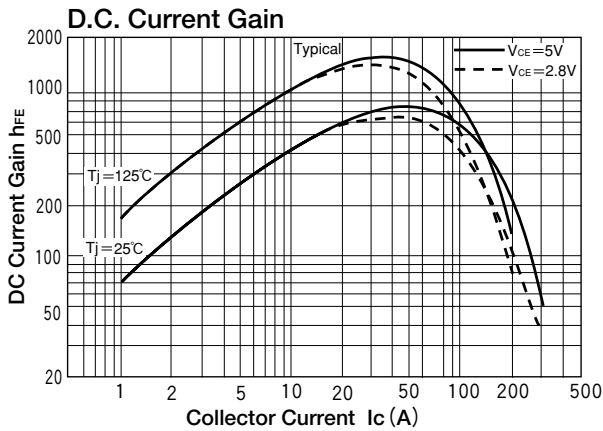
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA200AA120		
V_{CBO}	Collector-Base Voltage	Emitter open	1200		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	1200		V
$V_{CEX(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C=40A$, $I_{B2}=-5A$	1200		V
V_{EBO}	Emitterr-Base Voltage	Collector open	10		V
I_C	Collector Current		200		A
$-I_C$	Reverse Collector Current		200		A
I_B	Base Current		10		A
P_C	Collector-Emitter power dissipation	$T_C=25^\circ C$	1560		W
T_j	Junction Temperature		-40 to 150		$^\circ C$
T_{stg}	Storage Temperature		-40 to 125		$^\circ C$
V_{iso}	Isolation Voltage(RMS)	A.C. 1minute	2500		V
	Mounting Torque(M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)		N·m (kgf·cm)
	Mass	Typical Value	675		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings		Unit
			Min.	Max	
I_{CBO}	Collector Cut-off Current	$V_{CB}=1000V$ Emttter open		4.00	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=10V$ Collector open		500	mA
h_{FE}	D.C. Current Gain	$I_C=200A$, $V_{CE}=5V$	75		
$V_{CE(sat)}$	Collector-Emitter Sturation Voltage	$I_C=200A$, $I_B=4A$		3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=200A$, $I_B=4A$		3.5	V
t_{on}	Switching Time	On Time		3.0	μs
t_{stg}		Storage Time	$V_{CC}=600V$, $I_C=200A$ $I_{B1}=4A$, $I_{B2}=-4A$	15.00	
t_f		Fall Time		3.0	
V_{ECO}	Collector-Emitter Reverse Voltage (Diode forward voltage drop)	$-I_C=200A$		1.8	V
$R_{th(j-c)}$	Thermal Impedance (Junction to case)	Transistor part		0.08	$^\circ C/W$
		Diode part		0.35	



TRANSISTOR MODULE (Hi-β)

QCA75BA60



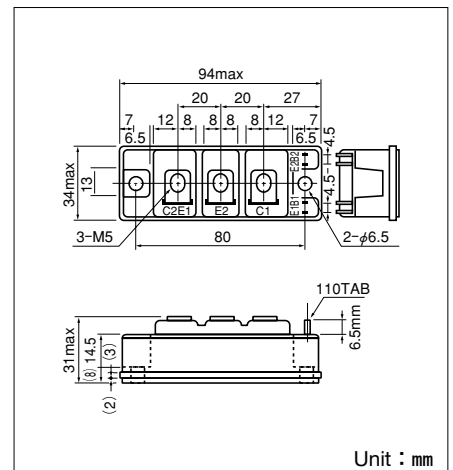
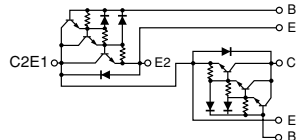
UL;E76102(M)

QCA75BA60 is a dual Darlington power transistor module which has series-connected **ULTRA HIGH** h_{FE} , high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode ($trr : 200ns$). The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction,

- $I_C=75A$, $V_{CEX}=600V$
- Low saturation voltage for higher efficiency.
- **ULTRA HIGH** DC current gain h_{FE} . $h_{FE} \geq 750$
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VWVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



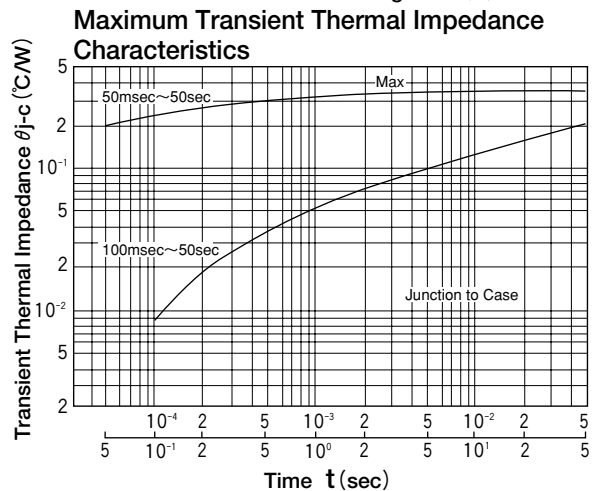
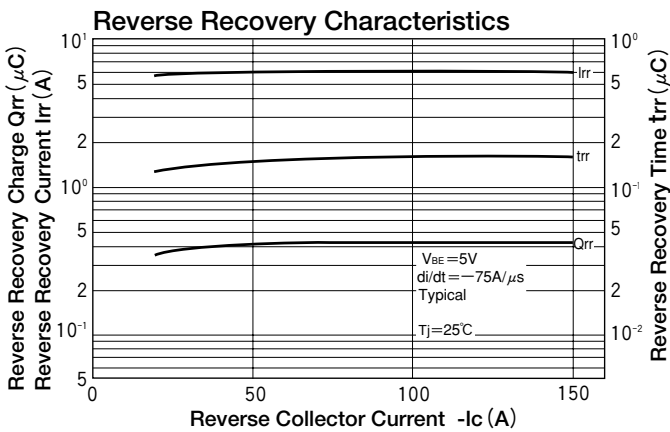
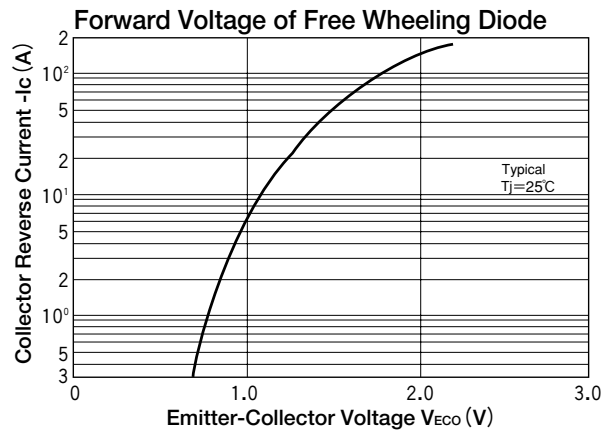
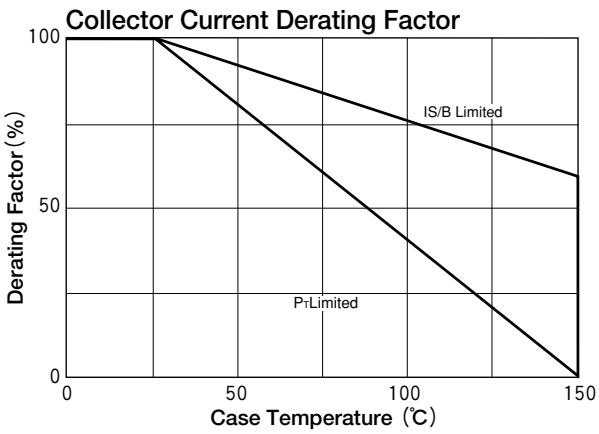
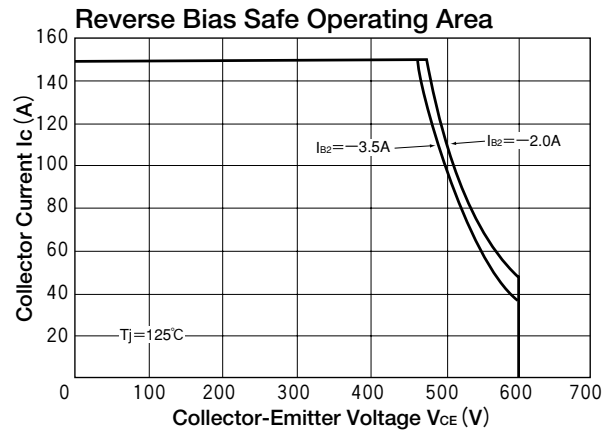
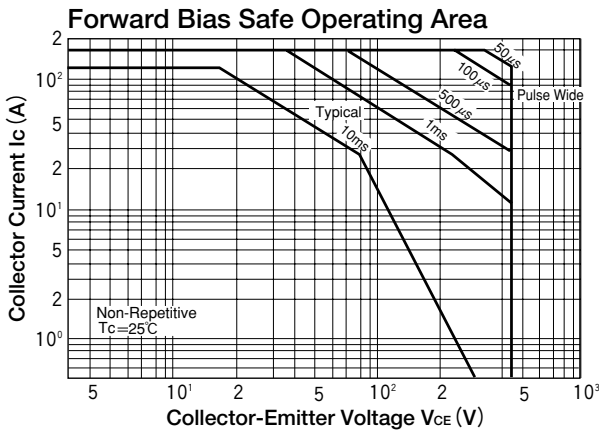
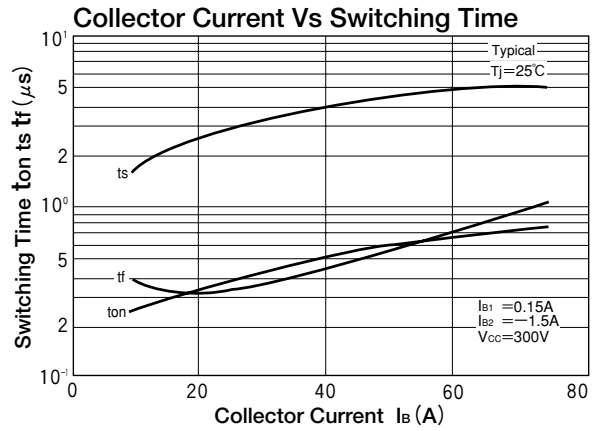
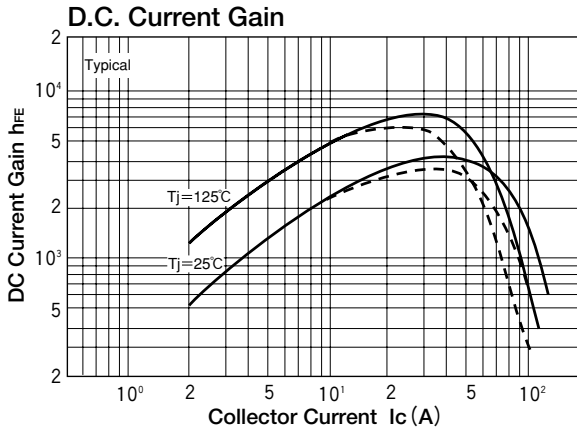
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA75BA60		
V_{CBO}	Collector-Base Voltage		600		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE} = -2V$	600		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $pw \leq 1ms$	75 (150)		A
$-I_C$	Reverse Collector Current		75		A
I_B	Base Current		4.5		A
P_T	Total power dissipation	$T_C=25^\circ C$	350		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)		N·m kgf·cm
		Termnal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	Typical Value	240		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB} = V_{CBO}$			1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = V_{EBO}$			300	mA
$V_{CEO(SUS)}$	Collector Emitter Sustaning Voltage	$I_C=1A$	450			V
$V_{CEX(SUS)}$		$I_C=15A, I_{B2}=-5A$	600			
h_{FE}	D.C. Current Gain	$I_C=75A, V_{CE}=2.5V$	750			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75A, I_B=100mA$			2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=75A, I_B=100mA$			3.0	V
t_{on}	Switching Time	On Time			2.0	μs
t_s		Storage Time	$V_{CC}=300V, I_C=75A$ $I_{B1}=150mA, I_{B2}=-1.5A$		8.0	
t_f		Fall Time			2.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$I_C=-75A$			1.8	V
trr	Reverse Recovery time	$V_{CC}=300V, -I_C=75A, -di/dt=75A/\mu A, V_{BE}=-5V$		200		ns
$R_{th(j-c)}$	Thermal Impedance (junction to case)	transistor part			0.35	$^\circ C/W$
		Diode part			1.3	



TRANSISTOR MODULE (Hi-β)

QCA100BA60



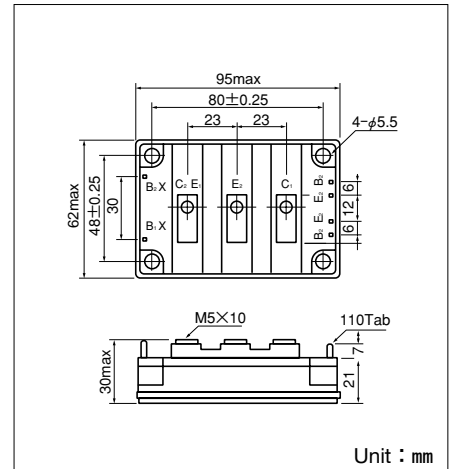
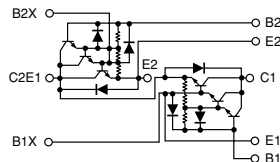
UL;E76102 (M)

QCA100BA60 is a dual Darlington power transistor module which has series-connected **ULTRA HIGH** h_{FE} , high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode (t_{rr} : 200ns). The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction,

- $I_C=100A$, $V_{CEX}=600V$
- Low saturation voltage for higher efficiency.
- **ULTRA HIGH** DC current gain h_{FE} . $h_{FE} \geq 750$
- Isolated mounting base
- V_{EBO} 10V for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



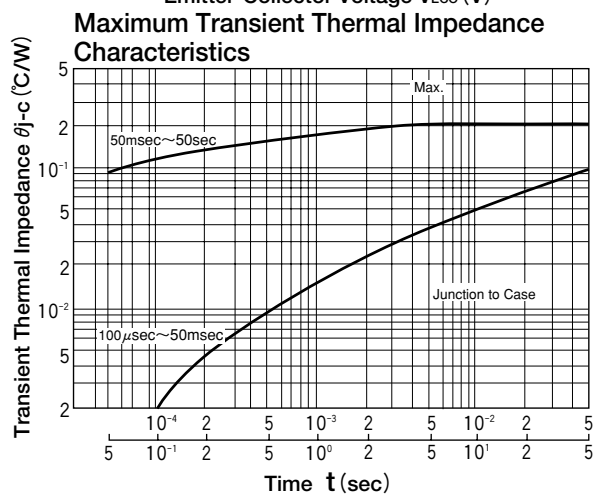
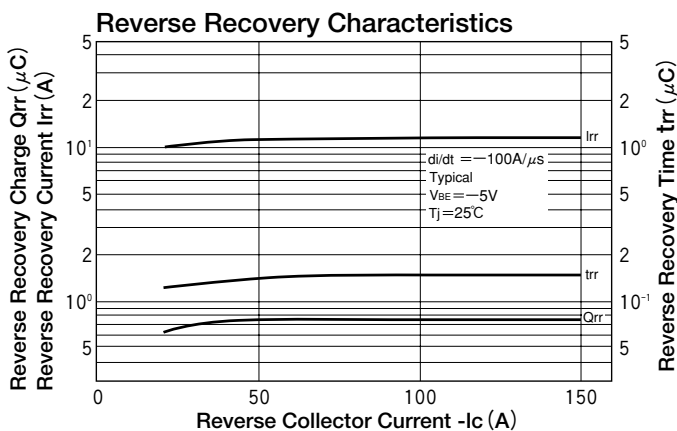
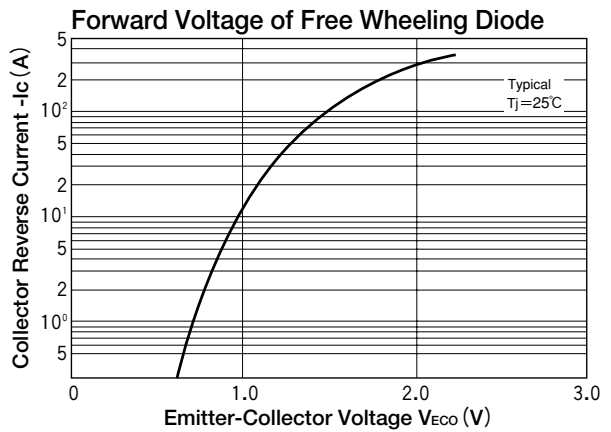
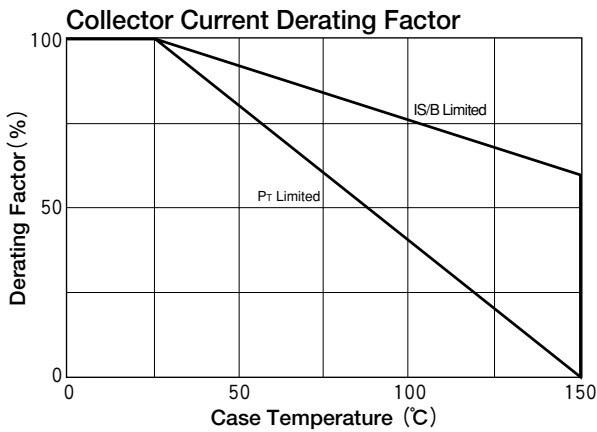
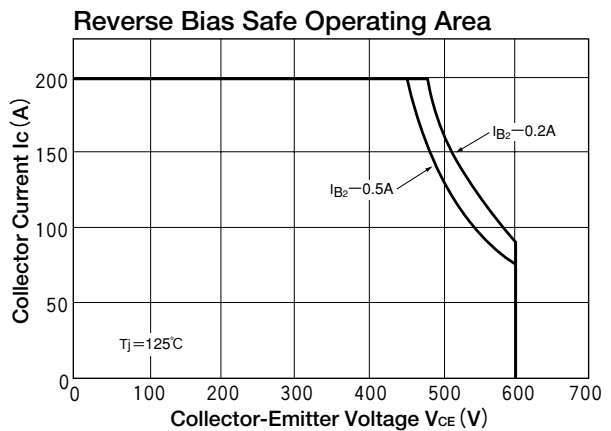
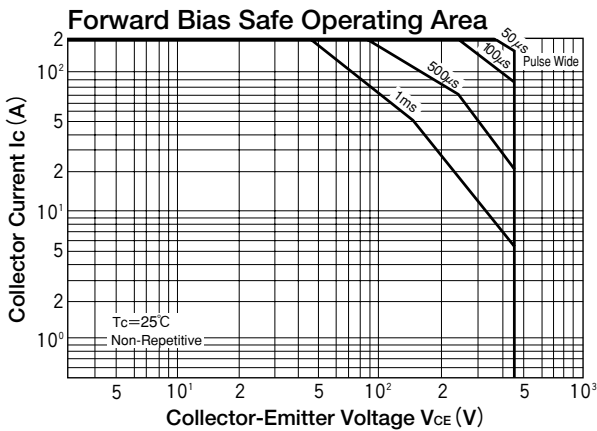
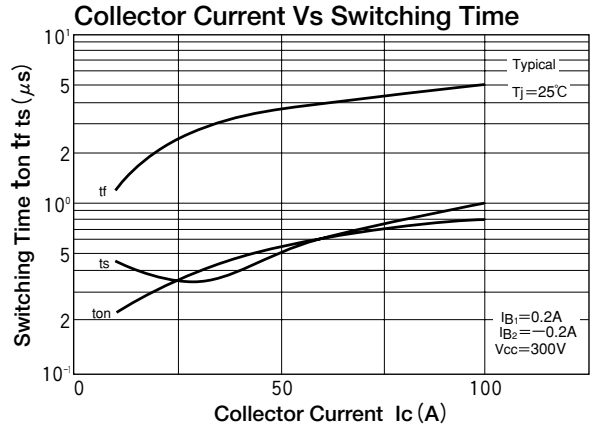
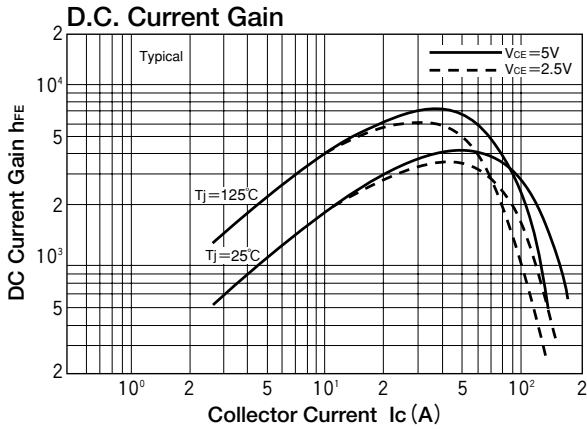
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA100BA60		
V_{CBO}	Collector-Base Voltage		600		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	600		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	100 (200)		A
$-I_C$	Reverse Collector Current		100		A
I_B	Base Current		6		A
P_T	Total power dissipation	$T_C=25^\circ C$	620		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	Typical Value	360		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			最小	標準	最大	
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$			1.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$			400	mA
$V_{CEO(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=1A$	450			V
$V_{CEX(SUS)}$		$I_C=20A, I_{B2}=-5A$	600			
h_{FE}	D.C. Current Gain	$I_C=100A, V_{CE}=2.5V$	750			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100A, I_B=130mA$			2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=100A, I_B=130mA$			3.0	V
t_{on}	Switching Time	On Time			2.0	μs
t_s		Storage Time	$V_{CC}=300V, I_C=100A$		8.0	
t_f		Fall Time	$I_{B1}=0.2A, I_{B2}=-2A$		2.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$I_C=-100A$			1.8	V
t_{rr}	Reverse Recovery time	$V_{CC}=300V, -I_C=100A, -di/dt=100/\mu s, V_{BE}=-5V$	200			ns
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part			0.2	$^\circ C/W$
		Diode part			0.6	



TRANSISTOR MODULE (Hi-β)

QCA150BA60



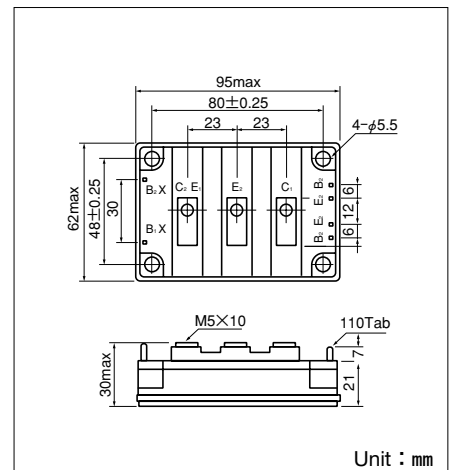
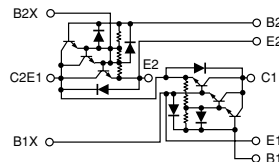
UL;E76102 (M)

QCA150BA60 is a dual Darlington power transistor module which has series-connected **ULTRA HIGH** h_{FE} , high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode (trr : 200ns). The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction.

- $I_C=150A$, $V_{CEX}=600V$
- Low saturation voltage for higher efficiency.
- **ULTRA HIGH** DC current gain h_{FE} . $h_{FE} \geq 750$
- Isolated mounting base
- V_{EBO} 10V for faster switching speed.

(Applications)

Motor Control (VWVF), AC/DC Servo, UPS,
Switching Power Supply, Ultrasonic Application



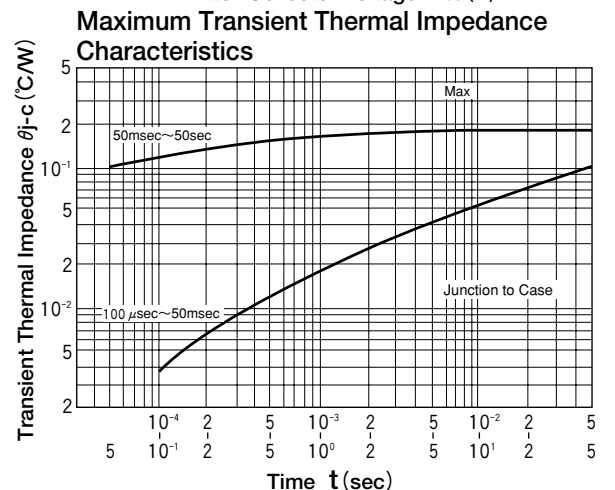
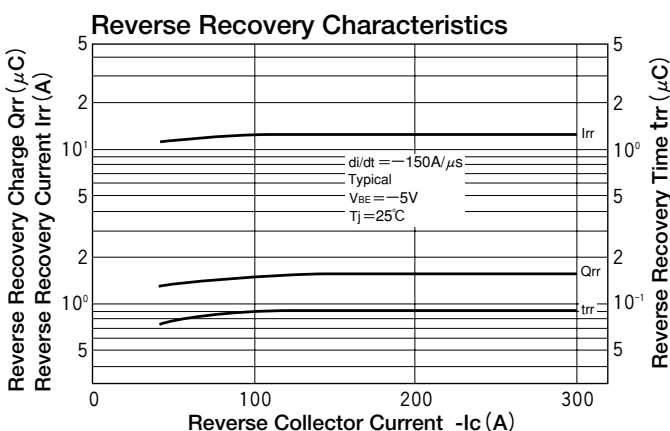
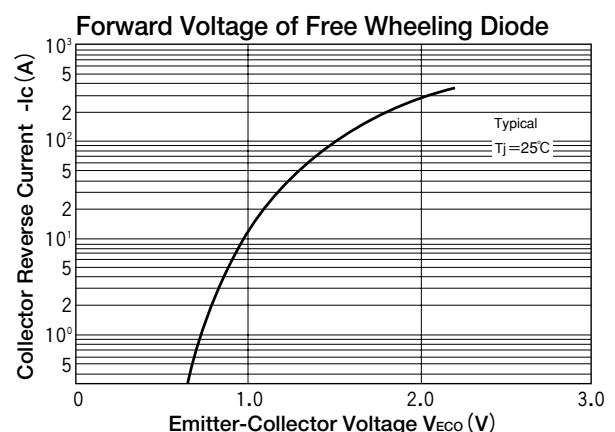
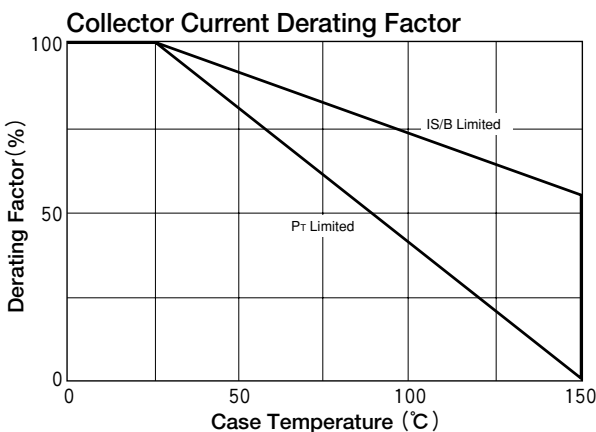
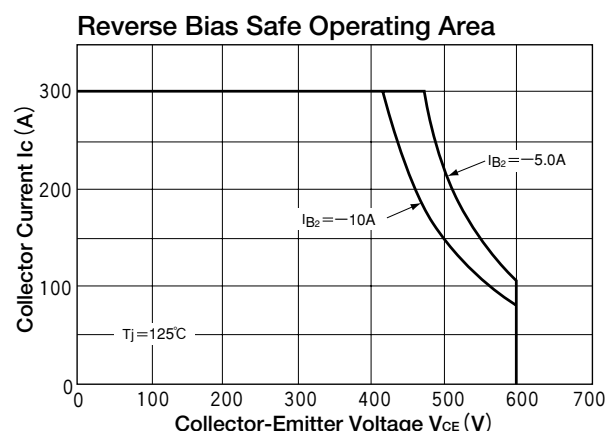
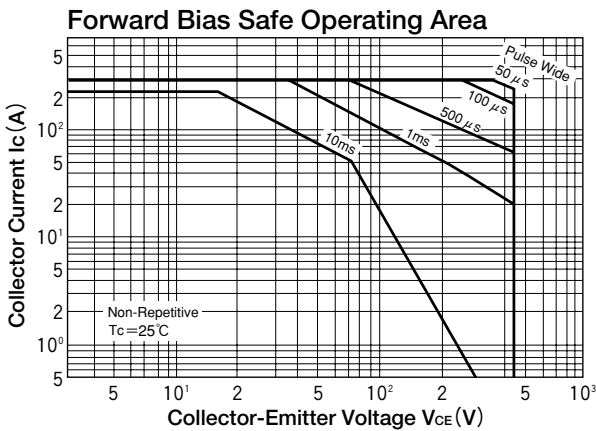
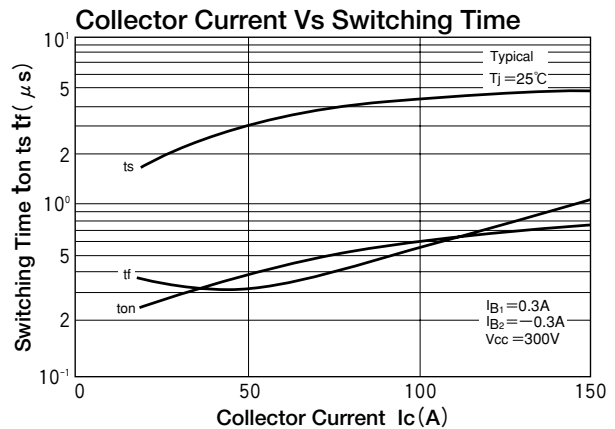
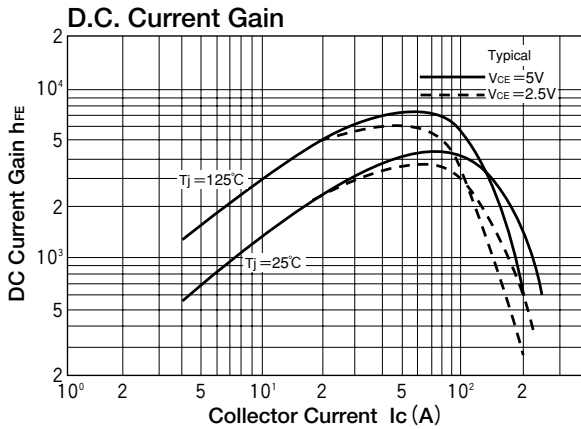
Maximum Ratings

($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA150BA60		
V_{CBO}	Collector-Base Voltage		600		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	600		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	150 (300)		A
$-I_C$	Reverse Collector Current		150		A
I_B	Base Current		9		A
P_T	Total power dissipation	$T_C=25^\circ C$	690		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 1.5-2.5 (15-25)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)		
	Mass	Typical Value	370		g

Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$			2.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$			600	mA
$V_{CEO(SUS)}$	Collector Emitter Sustaining Voltage	$I_C=1A$	450			V
$V_{CEX(SUS)}$		$I_C=30A, I_{B2}=-5A$	600			
h_{FE}	D.C. Current Gain	$I_C=150A, V_{CE}=2.5V$	750			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150A, I_B=200mA$			2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=150A, I_B=200mA$			3.0	V
t_{on}	Switching Time	On Time			2.0	μs
t_s		Storage Time	$V_{CC}=300V, I_C=150A$		8.0	
t_f		Fall Time	$I_{B1}=300mA, I_{B2}=-3A$		2.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$I_C=-150A$			1.8	V
trr	Reverse Recovery time	$V_{CC}=300V, -I_C=150A, -di/dt=150A/\mu s, V_{BE}=-5V$		200		ns
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part			0.18	$^\circ C/W$
		Diode part			0.6	



TRANSISTOR MODULE (Hi-β)

QCA200BA60

TOP



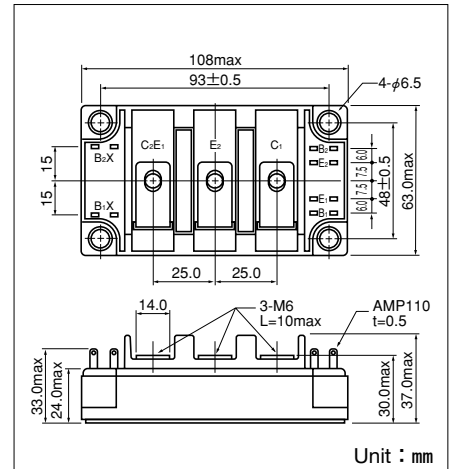
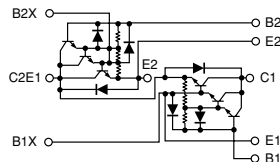
UL;E76102 (M)

QCA200BA60 is a dual Darlington power transistor module which has series-connected **ULTRA HIGH** h_{FE} , high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode ($trr : 200ns$). The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction,

- $I_C=200A$, $V_{CEX}=600V$
- Low saturation voltage for higher efficiency.
- **ULTRA HIGH** DC current gain h_{FE} . $h_{FE} \geq 750$
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Maximum Ratings

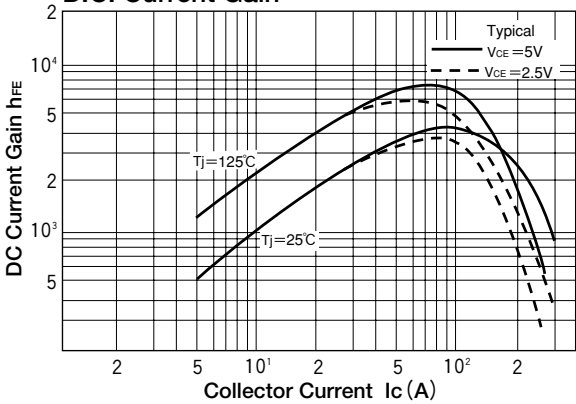
($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA200BA60		
V_{CBO}	Collector-Base Voltage		600		V
V_{CEX}	Collector-Emmitter Voltage	$V_{BE} = -2V$	600		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $p_w \leq 1ms$	200 (400)		A
$-I_C$	Reverse Collector Current		200		A
I_B	Base Current		12		A
P_T	Total power dissipation	$T_C = 25^\circ C$	1250		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{ISO}	Isolation Voltage	A.C.1minute	2500		
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)		N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)		
	Mass	Typical Value	470		g

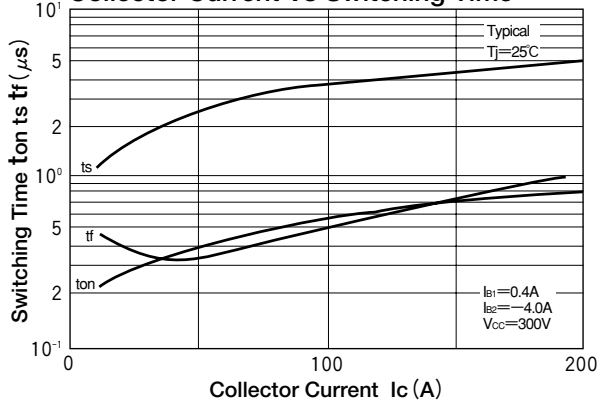
Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB} = V_{CBO}$			2.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = V_{EBO}$			800	mA
$V_{CEO(SUS)}$	Collector Emmitter Sustaning Voltage	$I_C = 1A$	450			V
$V_{CEX(SUS)}$		$I_C = 40A, I_{B2} = -8A$	600			
h_{FE}	D.C. Current Gain	$I_C = 200A, V_{CE} = 2.5V$	750			
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$I_C = 200A, I_B = 0.26A$			2.5	V
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage	$I_C = 200A, I_B = 0.26A$			3.0	V
t_{on}	Switching Time	On Time			2.0	μs
t_s		Storage Time	$V_{CC} = 300V, I_C = 200A$		8.0	
t_f		Fall Time	$I_{B1} = 0.4A, I_{B2} = -4A$		2.0	
V_{ECO}	Collector-Emmitter Reverse Voltage	$I_C = -200A$			1.8	V
trr	Reverse Recovery time	$V_{CC} = 300V, I_C = -200A, -di/dt = 200A/\mu s, V_{BE} = -5V$		200		ns
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part			0.1	$^\circ C/W$
		Diode part			0.3	

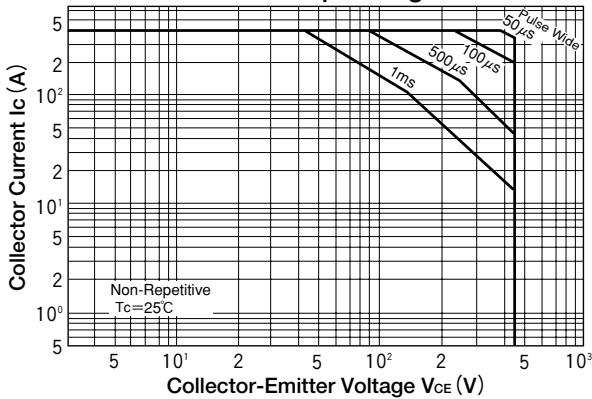
D.C. Current Gain



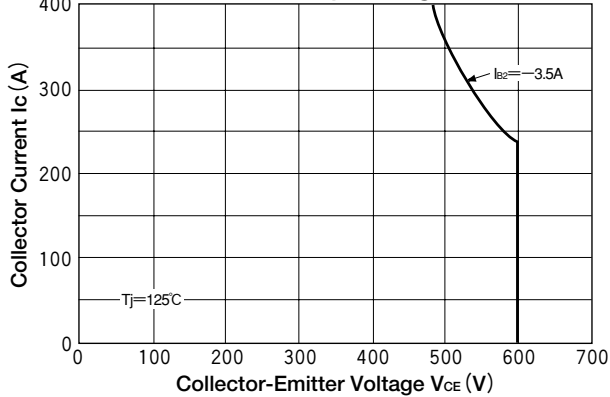
Collector Current Vs Switching Time



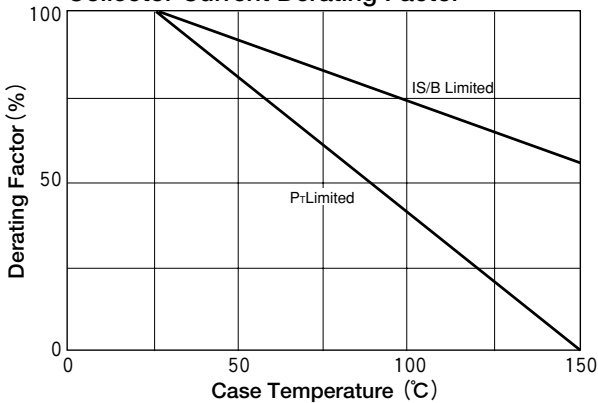
Forward Bias Safe Operating Area



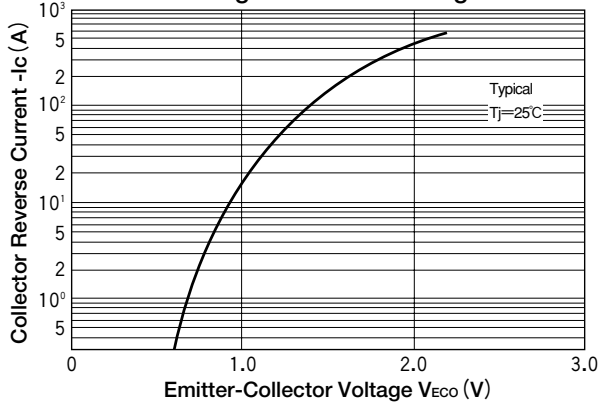
Reverse Bias Safe Operating Area



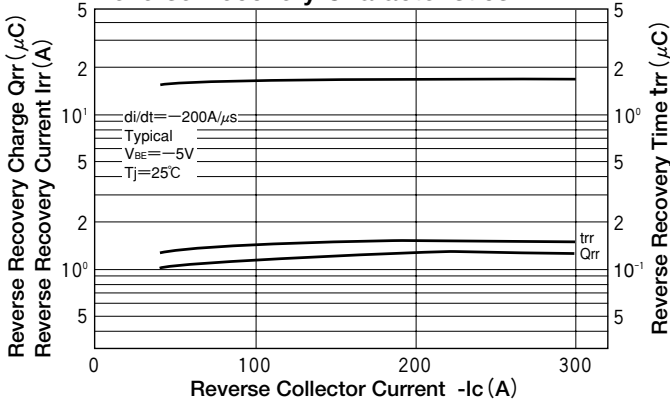
Collector Current Derating Factor



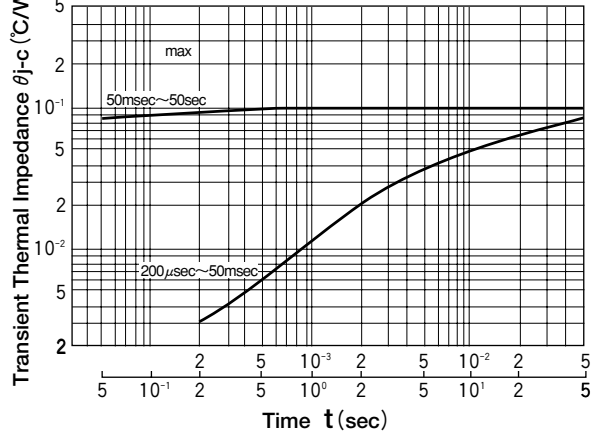
Forward Voltage of Free Wheeling Diode



Reverse Recovery Characteristics



Maximum Transient Thermal Impedance Characteristics



TRANSISTOR MODULE (Hi-β)

QCA300BA60



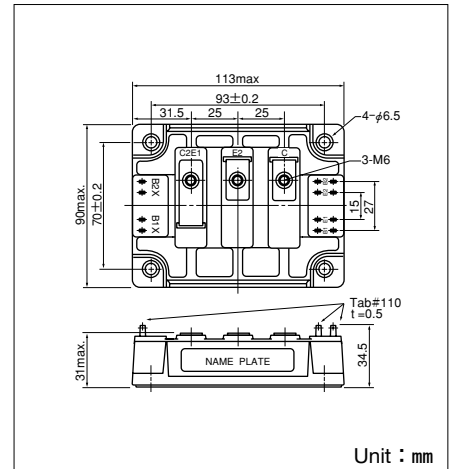
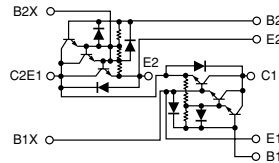
UL;E76102 (M)

QCA300BA60 is a dual Darlington power transistor module which has series-connected **ULTRA HIGH** h_{FE} , high speed, high power Darlington transistor. Each transistor has a reverse paralleled fast recovery diode ($trr : 200ns$). The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction,

- $I_C=300A$, $V_{CEX}=600V$
- Low saturation voltage for higher efficiency.
- **ULTRA HIGH** DC current gain h_{FE} . $h_{FE} \geq 750$
- Isolated mounting base
- $V_{EBO} 10V$ for faster switching speed.

(Applications)

Motor Control (VWVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application



Maximum Ratings

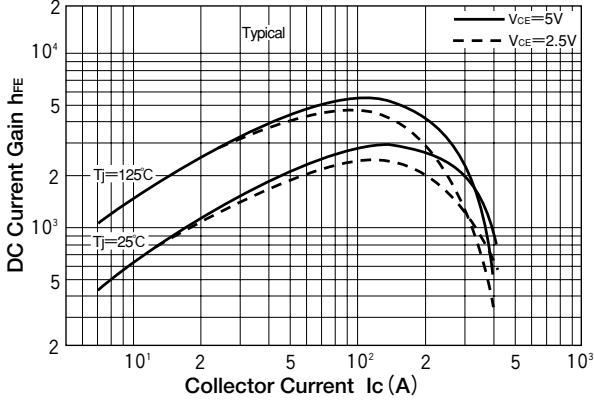
($T_j=25^\circ C$ unless otherwise specified)

Symbol	Item	Conditions	Ratings		Unit
			QCA300BA60		
V_{CBO}	Collector-Base Voltage		600		V
V_{CEX}	Collector-Emitter Voltage	$V_{BE}=-2V$	600		V
$V_{CEX(sus)}$	Collector-Emitter sustaining voltage	$I_C=60V$ $I_{B2}=-5A$	600		V
V_{EBO}	Emitter-Base Voltage		10		V
I_C	Collector Current	() $pw \leq 1ms$	300 (600)		A
$-I_C$	Reverse Collector Current		300		A
I_B	Base Current		18		A
P_T	Total power dissipation	$T_C=25^\circ C$	1380		W
T_j	Junction Temperature		-40 to +150		$^\circ C$
T_{stg}	Storage Temperature		-40 to +125		$^\circ C$
V_{iso}	Isolation Voltage	A.C.1minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)		N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)		
	Mass	Typical Value	675		g

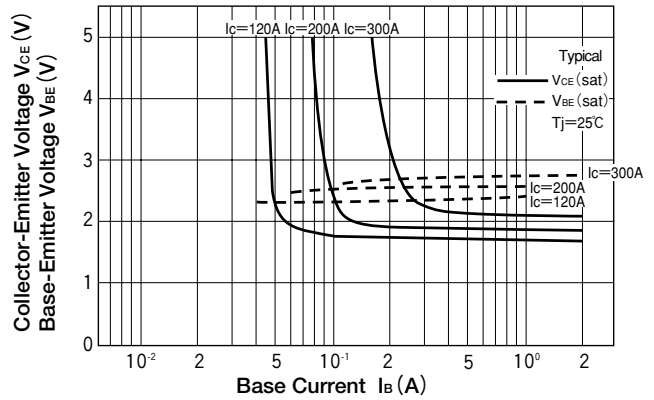
Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB}=V_{CBO}$			4.0	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=V_{EBO}$			500	mA
h_{FE}	D.C. Current Gain	$I_C=300A$, $V_{CE}=2.5V$	750			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=300A$, $I_B=400mA$			2.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C=300A$, $I_B=400mA$			3.0	V
t_{on}	Switching Time	On Time			2.0	μs
t_s		Storage Time	$V_{CC}=300V$, $I_C=300A$ $I_{B1}=0.6A$, $I_{B2}=-6A$		8.0	
t_f		Fall Time			2.0	
V_{ECO}	Collector-Emitter Reverse Voltage	$I_C=-300A$			2.2	V
trr	Reverse Recovery time	$V_{CC}=300V$, $I_C=-300A$, $-di/dt=300A/\mu s$, $V_{BE}=-5V$		200		ns
$R_{th(j-c)}$	Thermal Impedance (junction to case)	Transistor part			0.08	$^\circ C/W$
		Diode part			0.35	

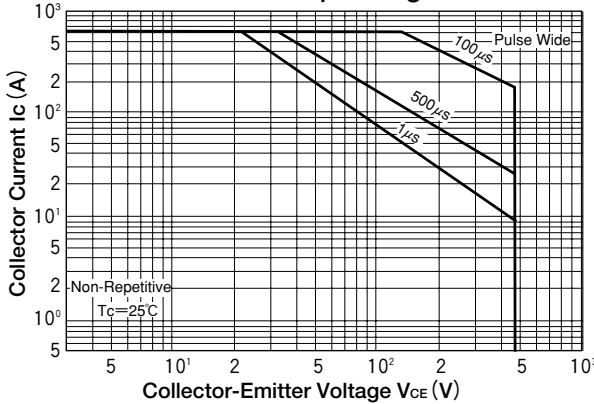
D.C. Current Gain



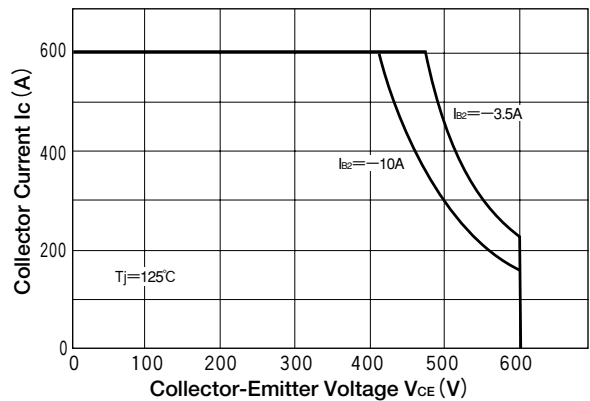
Saturation Characteristics



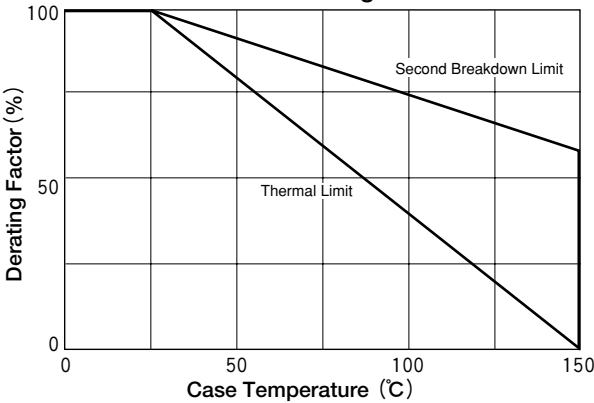
Forward Bias Safe Operating Area



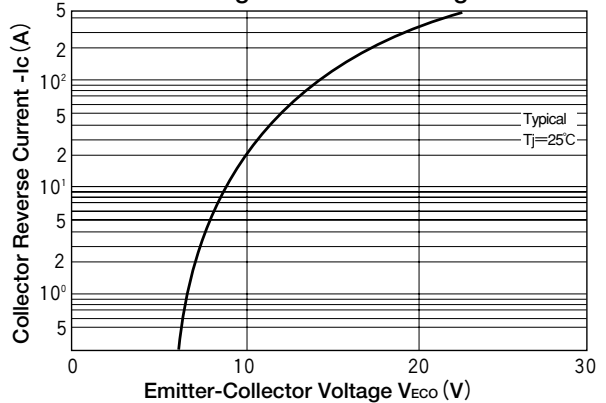
Reverse Bias Safe Operating Area



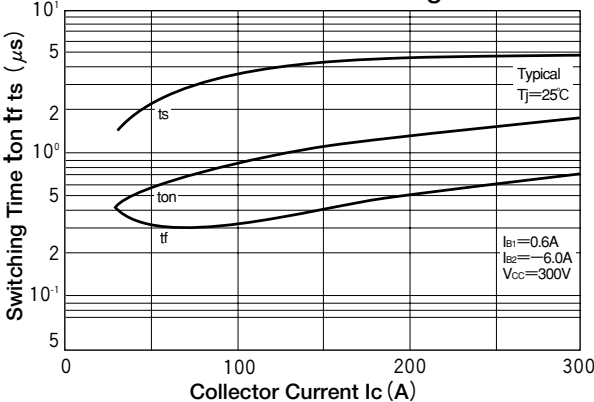
Collector Current Derating Factor



Forward Voltage of Free Wheeling Diode



Collector Current Vs Switching Time



Transient Thermal Impedance

