IGBT MODULE

GCA75BA60

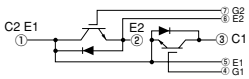
UL;E76102(M)

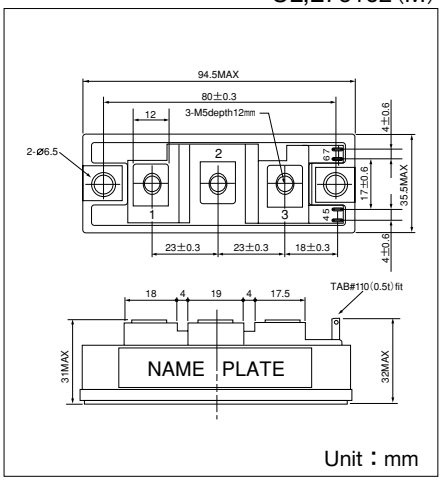
SanRex IGBT Module **GCA75BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

- Ic=75A VCES=600V
- VCE(sat) =2.4V Typ
- tf=0.10μs Typ
- Soft recovery diode

(Applications)

Inverter for motor control (VVVF)
UPS, AC servo
DC power supply, Welder





Unit : mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

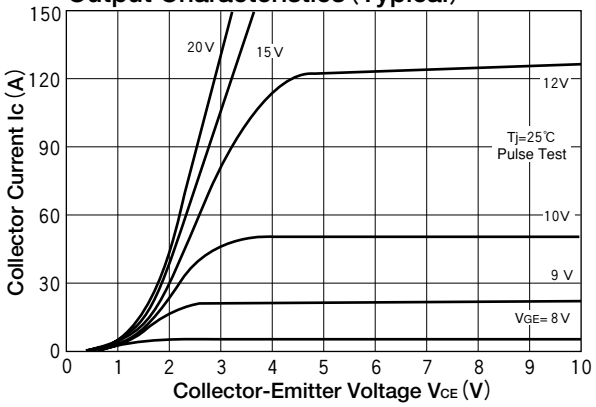
Symbol	Item		Conditions	Ratings	Unit
				GCA75BA60	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		75	A
ICP		Pulse (1 ms)		150	
−Ic	Reverse Collector Current			75	A
Pc	Total Power Dissipation		Tc=25℃	315	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	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

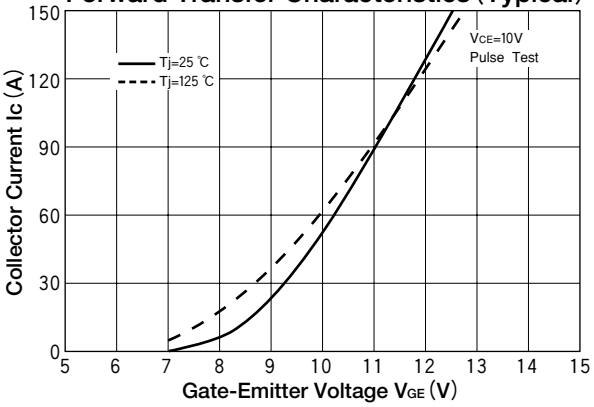
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=600V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	600			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=7.5mA	3.0		7.0	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=75A, VGE=15V		2.4	2.8	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		4	7.5	nF
tr	Switching Time	Rise Time	Ic=75A, VGE=+15V/−5V Vcc=300V, RG=8Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
VECS	Emitter-Collector Voltage		−Ic=75A, VGE=0V		1.80	2.80	V
trr	Reverse Recovery Time		−Ic=75A, VGE=−10V, di/dt=150A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.40	℃/W
			Diode-Case			0.55	

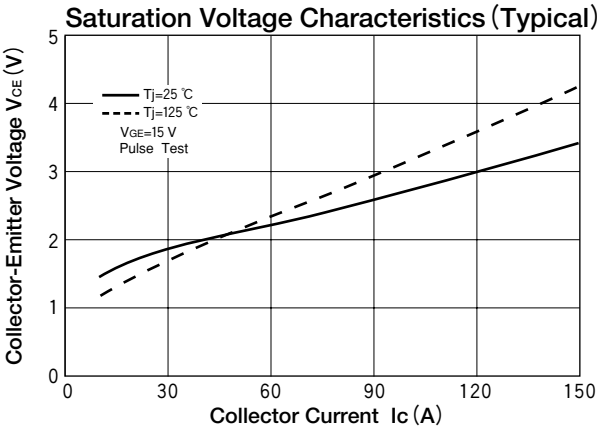
Output Characteristics (Typical)



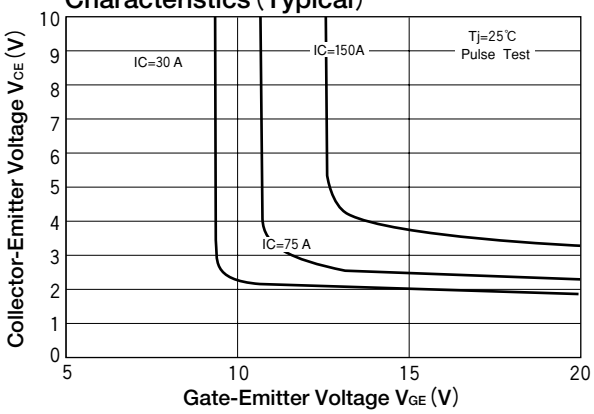
Forward Transfer Characteristics (Typical)



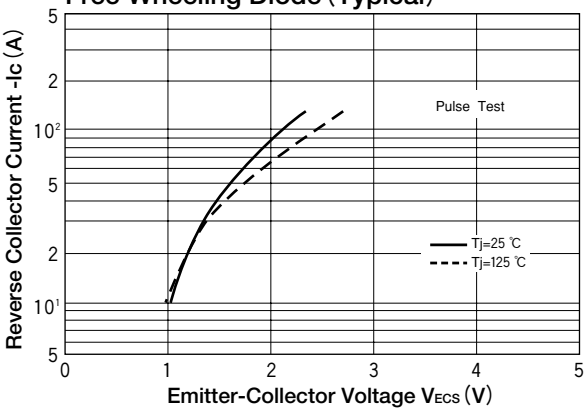
Saturation Voltage Characteristics (Typical)



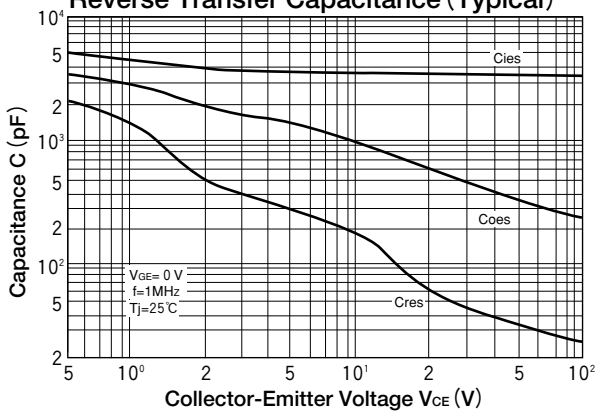
Collector-Emitter Saturation Voltage Characteristics (Typical)



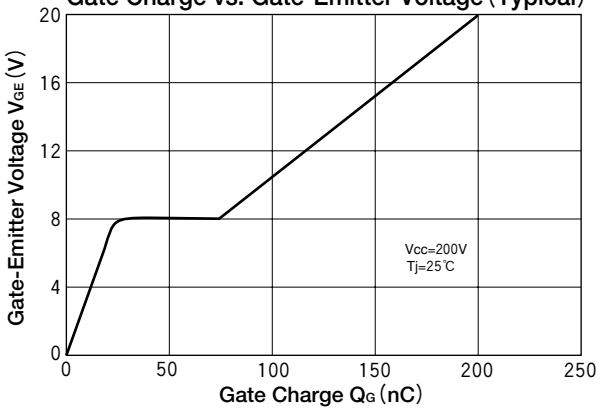
Forward Voltage of Free Wheeling Diode (Typical)



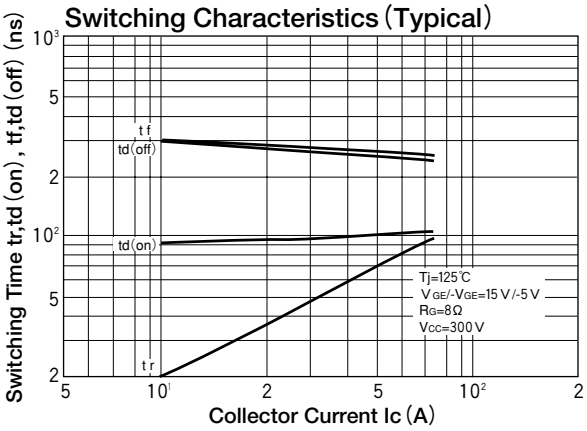
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



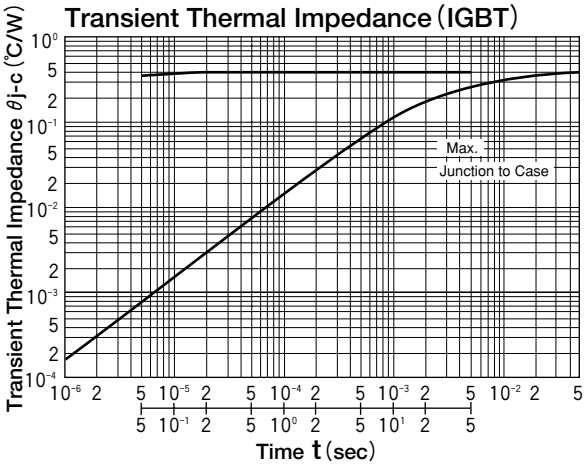
Gate Charge vs. Gate-Emitter Voltage (Typical)



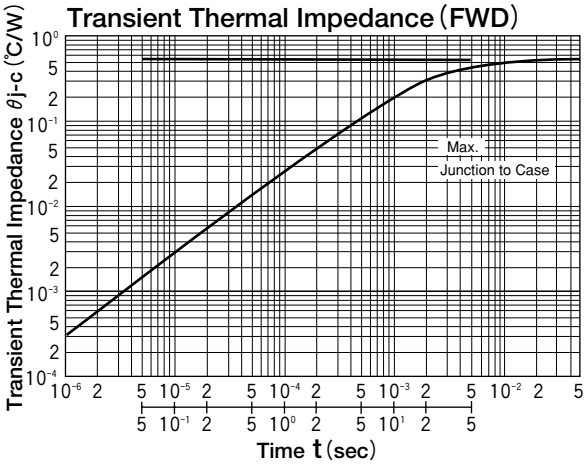
Switching Characteristics (Typical)



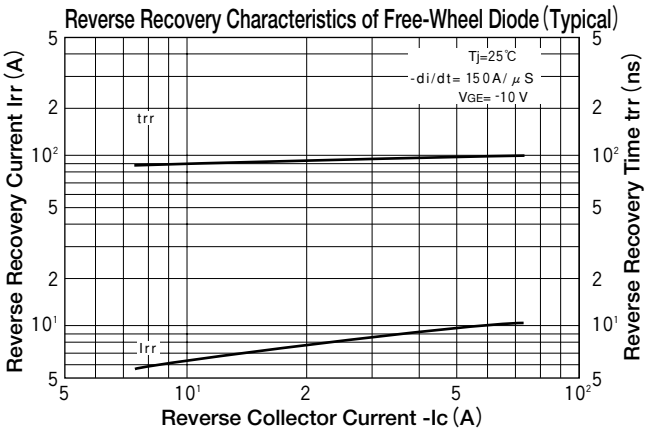
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA100BA60

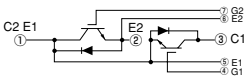
UL;E76102(M)

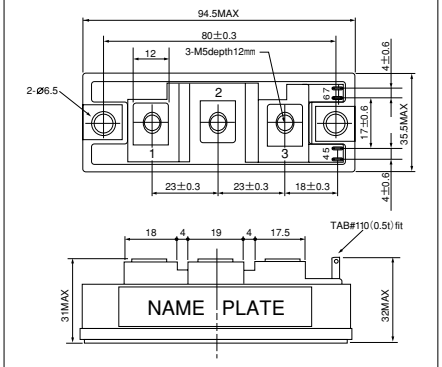
SanRex IGBT Module **GCA100BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

- Ic=100A　VCES=600V
- VCE(sat) =2.3V Typ
- tf=0.10μs Typ
- Soft recovery diode

(Applications)

Inverter for motor control (VVVF)
UPS, AC servo
DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

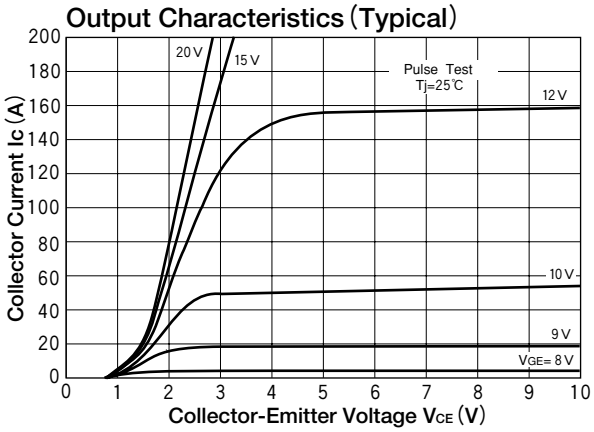
Symbol	Item		Conditions	Ratings	Unit
				GCA100BA60	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		100	A
ICP		Pulse (1 ms)		200	
−Ic	Reverse Collector Current			100	A
Pc	Total Power Dissipation		Tc=25℃	400	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	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

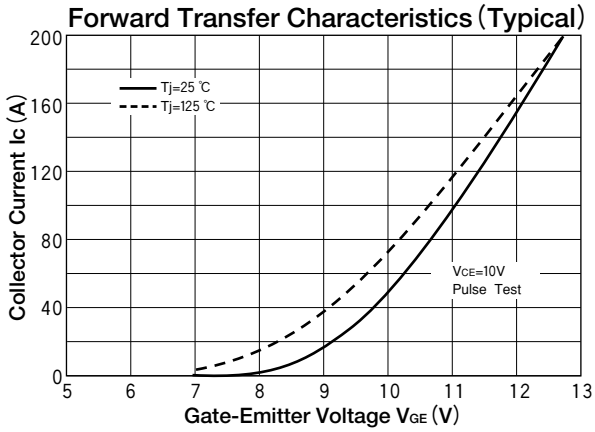
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=600V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	600			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=10mA	3.0		7.0	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=100A, VGE=15V		2.3	2.8	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		7	10	nF
tr	Switching Time	Rise Time	Ic=100A, VGE=+15V/−5V Vcc=300V, RG=6Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
VECS	Emitter-Collector Voltage		−Ic=100A, VGE=0V		2.00	2.80	V
trr	Reverse Recovery Time		−Ic=100A, VGE=−10V, di/dt=200A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.31	℃/W
			Diode-Case			0.55	

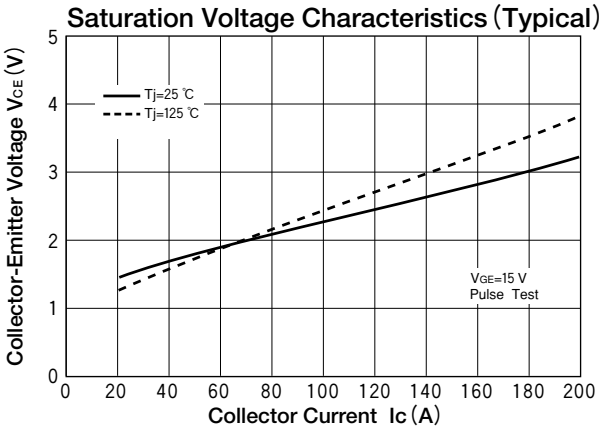
Output Characteristics (Typical)



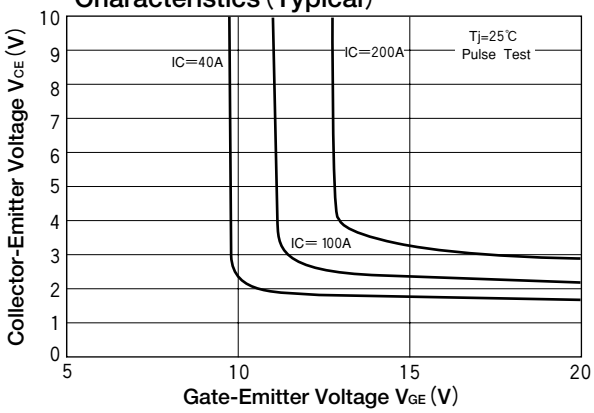
Forward Transfer Characteristics (Typical)



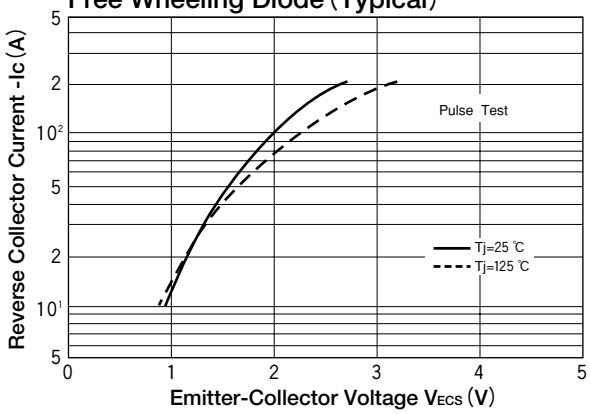
Saturation Voltage Characteristics (Typical)



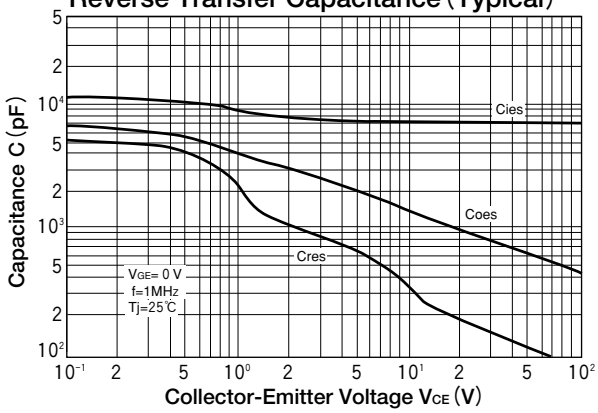
Collector-Emitter Saturation Voltage Characteristics (Typical)



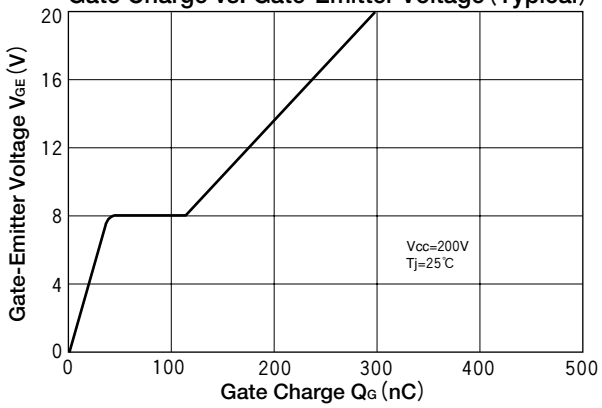
Forward Voltage of Free Wheeling Diode (Typical)



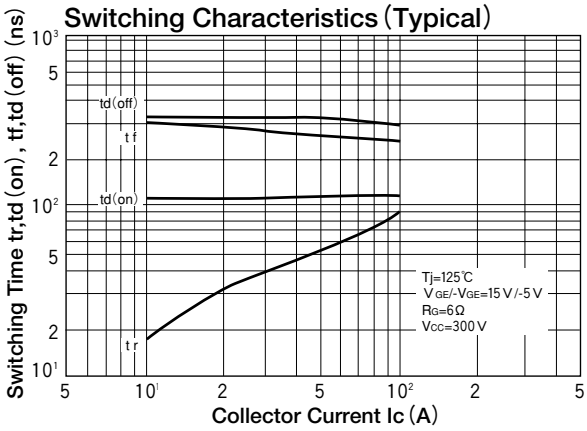
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



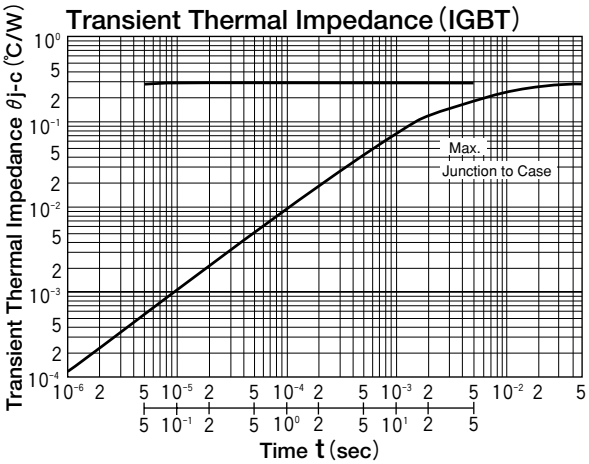
Gate Charge vs. Gate-Emitter Voltage (Typical)



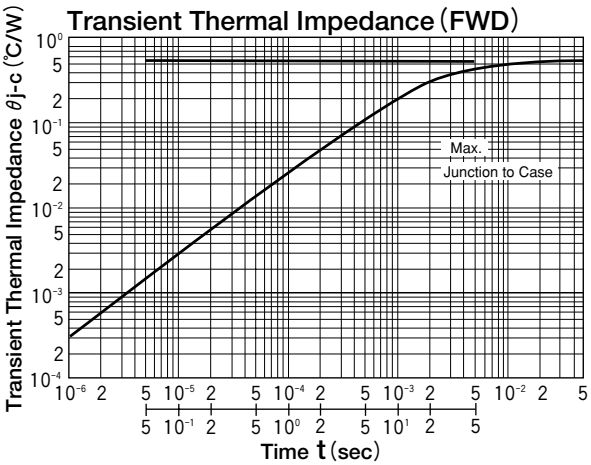
Switching Characteristics (Typical)



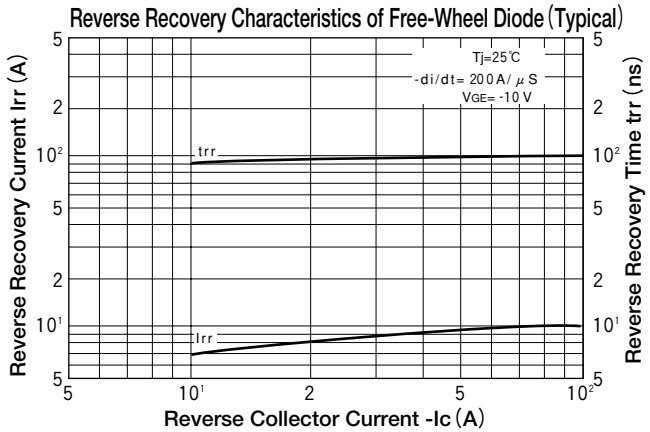
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA150BA60

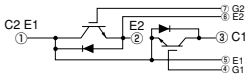
UL;E76102(M)

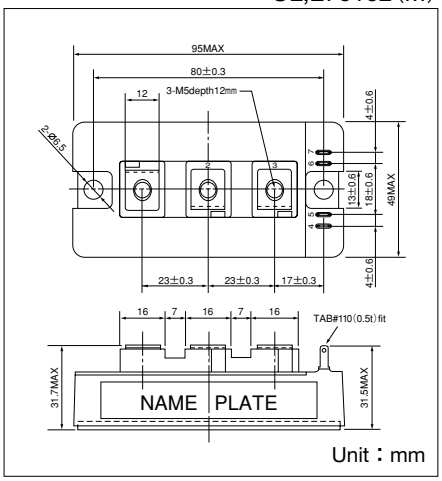
SanRex IGBT Module **GCA150BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

- Ic=150A　VCES=600V
- VCE(sat) =2.4V Typ
- tf=0.10μs Typ
- Soft recovery diode

(Applications)

Inverter for motor control (VVVF)
UPS, AC servo
DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

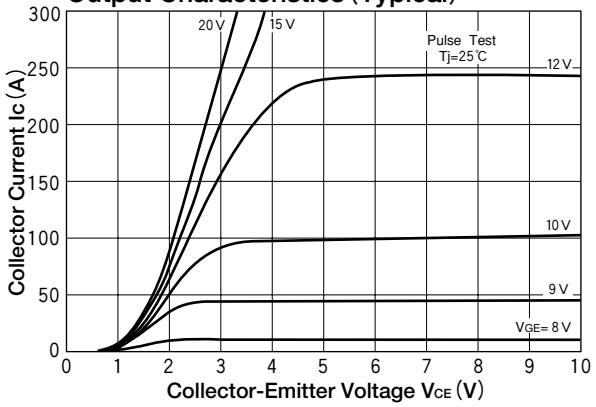
Symbol	Item		Conditions	Ratings	Unit
				GCA150BA60	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		150	A
ICP		Pulse（1 ms）		300	
−Ic	Reverse Collector Current			150	A
Pc	Total Power Dissipation		Tc=25℃	600	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	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	225	g

■Electrical Characteristics

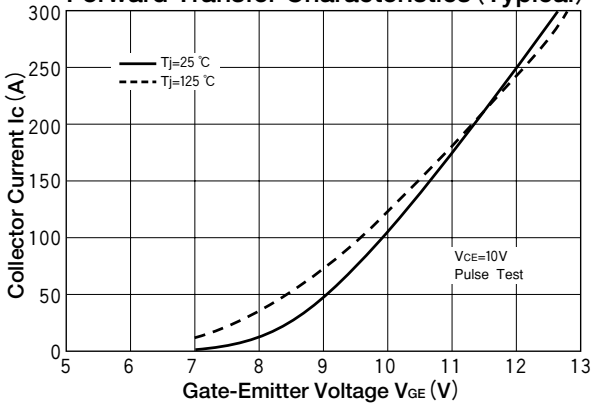
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=600V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	600			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=15mA	3.0		7.0	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=150A, VGE=15V		2.4	2.8	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		9	15	nF
tr	Switching Time	Rise Time	Ic=150A, VGE=+15V/−5V Vcc=300V, RG=4Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
VECS	Emitter-Collector Voltage		−Ic=150A, VGE=0V		2.30	2.80	V
trr	Reverse Recovery Time		−Ic=150A, VGE=−10V, di/dt=300A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.21	℃/W
			Diode-Case			0.50	

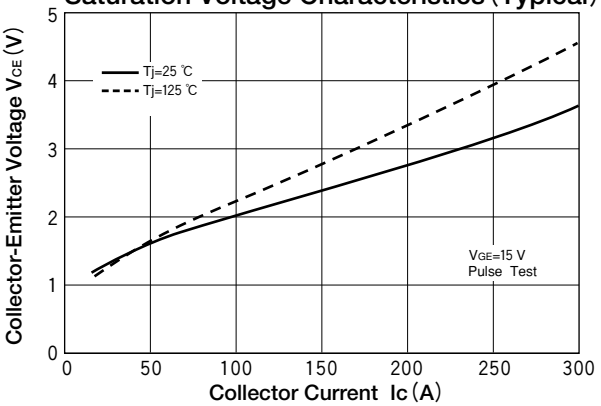
Output Characteristics (Typical)



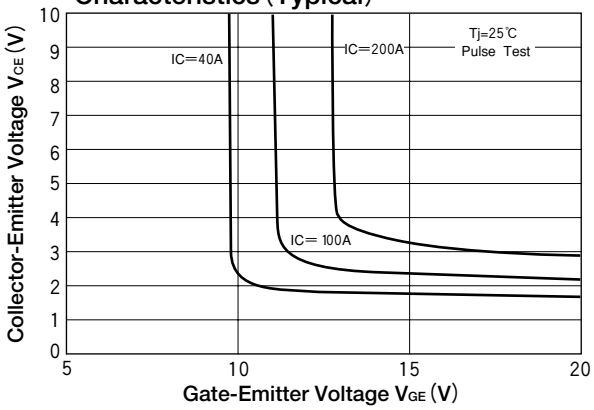
Forward Transfer Characteristics (Typical)



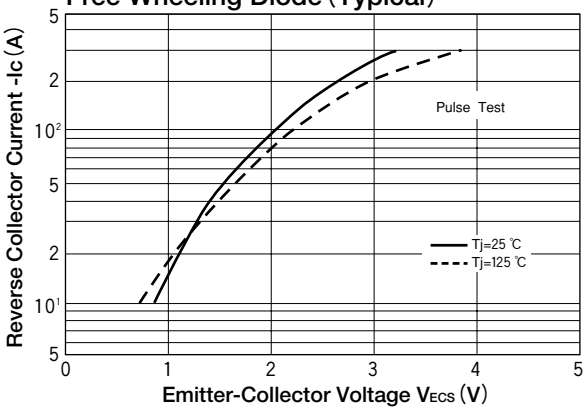
Saturation Voltage Characteristics (Typical)



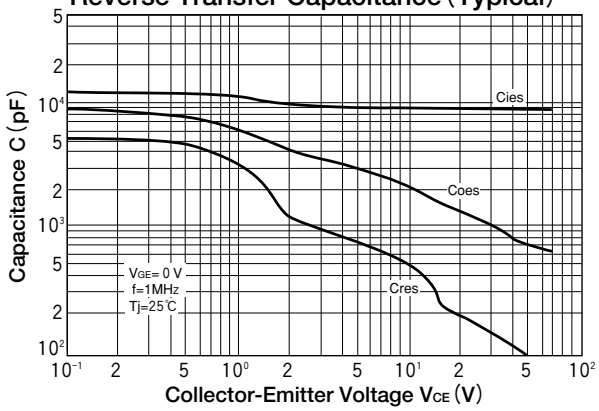
Collector-Emitter Saturation Voltage Characteristics (Typical)



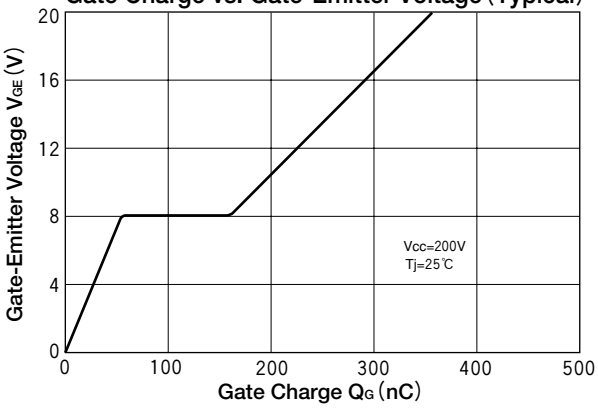
Forward Voltage of Free Wheeling Diode (Typical)



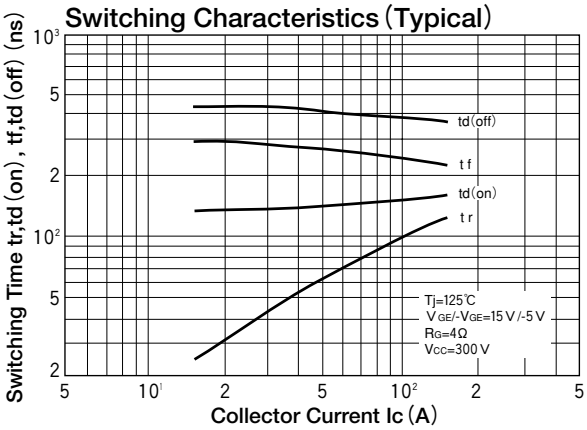
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



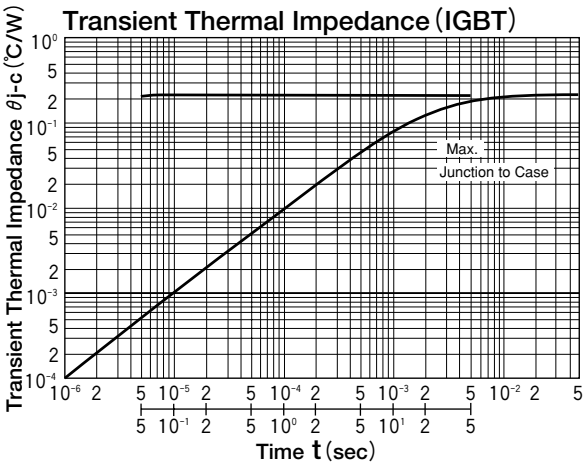
Gate Charge vs. Gate-Emitter Voltage (Typical)



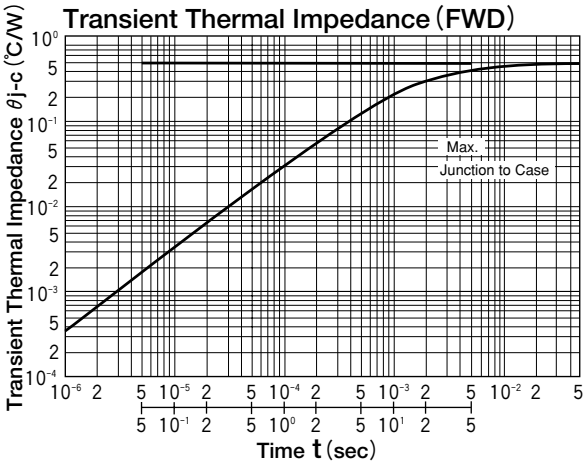
Switching Characteristics (Typical)



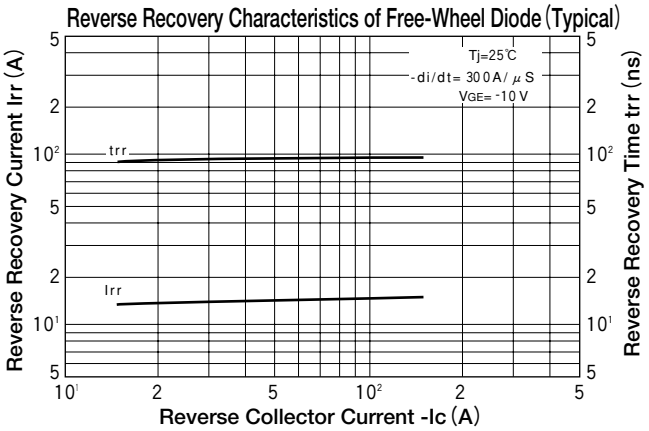
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA200BA60

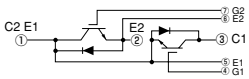
UL;E76102(M)

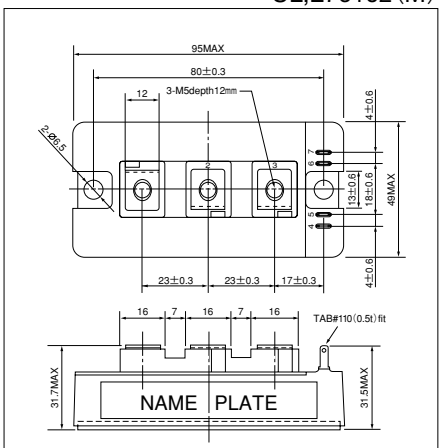
SanRex IGBT Module **GCA200BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

- Ic=200A　VCES=600V
- VCE(sat) =2.3V Typ
- tf=0.10μs Typ
- Soft recovery diode

(Applications)

Inverter for motor control (VVVF)
UPS, AC servo
DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

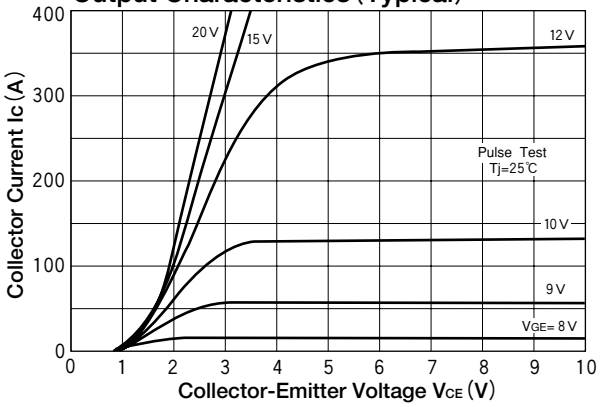
Symbol	Item		Conditions	Ratings	Unit
				GCA200BA60	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		200	A
ICP		Pulse（1 ms）		400	
−Ic	Reverse Collector Current			200	A
Pc	Total Power Dissipation		Tc=25℃	780	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	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	225	g

■Electrical Characteristics

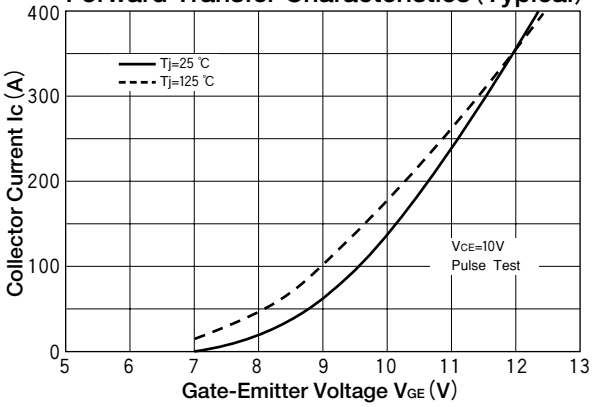
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=600V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	600			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=20mA	3.0		7.0	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=200A, VGE=15V		2.3	2.8	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		15	20	nF
tr	Switching Time	Rise Time	Ic=200A, VGE=+15V/−5V Vcc=300V, RG=3Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
VECS	Emitter-Collector Voltage		−Ic=200A, VGE=0V		2.30	2.80	V
trr	Reverse Recovery Time		−Ic=200A, VGE=−10V, di/dt=400A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.16	℃/W
			Diode-Case			0.40	

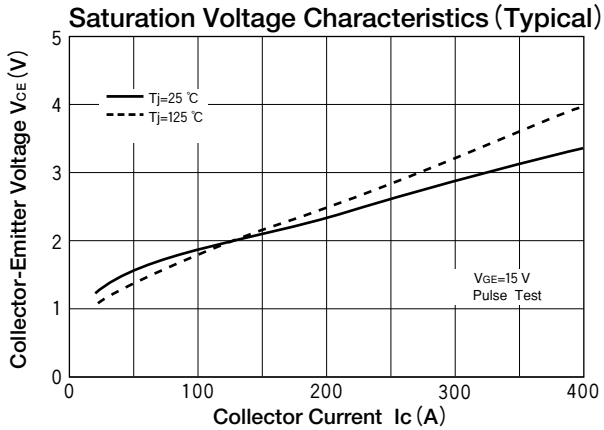
Output Characteristics (Typical)



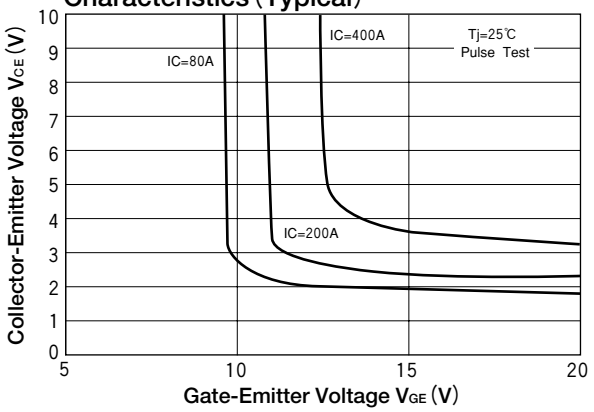
Forward Transfer Characteristics (Typical)



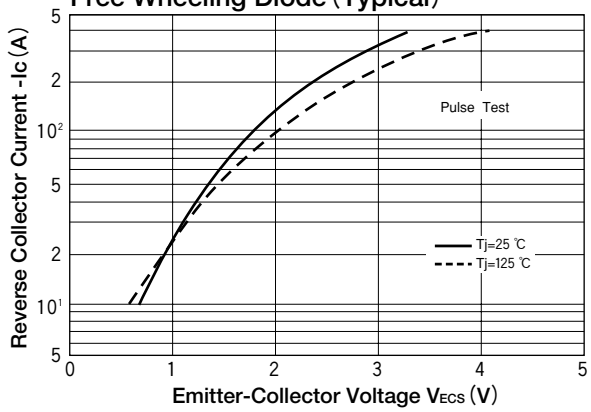
Saturation Voltage Characteristics (Typical)



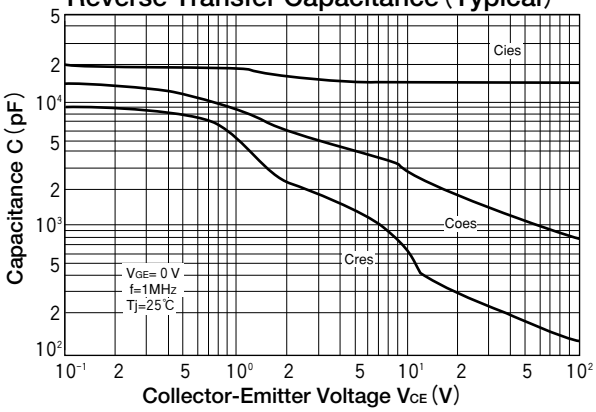
Collector-Emitter Saturation Voltage Characteristics (Typical)



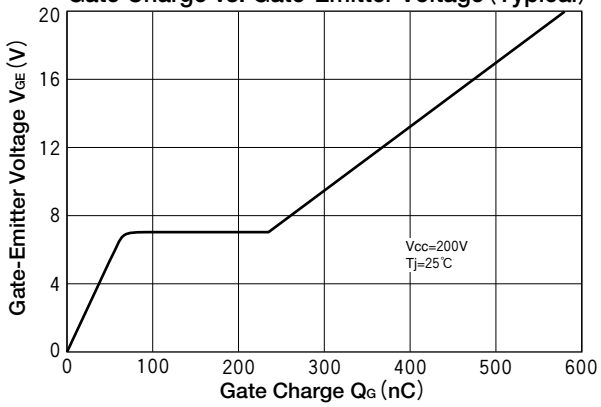
Forward Voltage of Free Wheeling Diode (Typical)



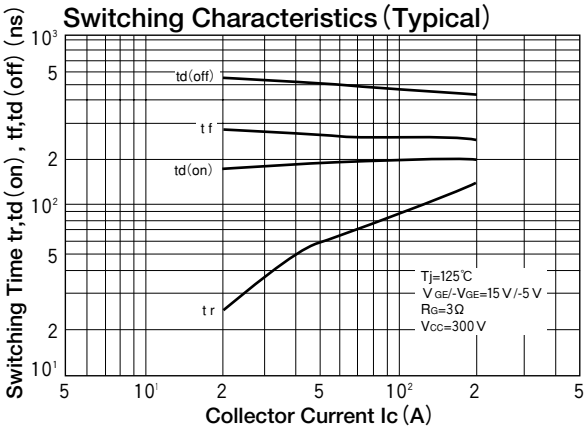
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



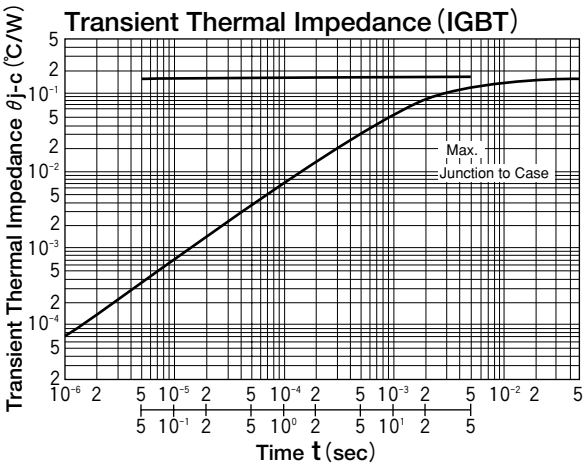
Gate Charge vs. Gate-Emitter Voltage (Typical)



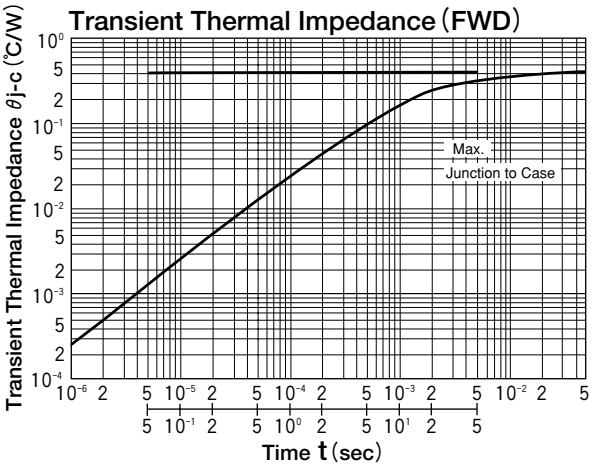
Switching Characteristics (Typical)



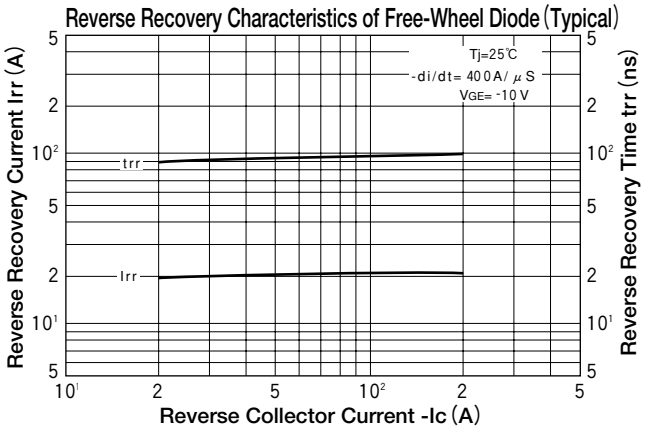
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA300BA60

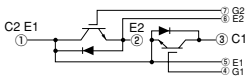
UL;E76102(M)

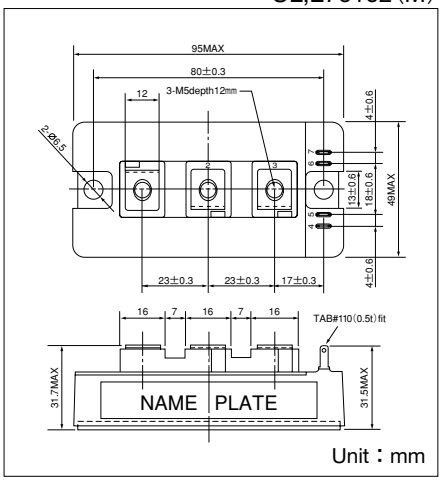
SanRex IGBT Module **GCA300BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

- I_C=300A V_{CES}=600V
- $V_{CE(sat)}$ =2.4V Typ
- tf=0.10μs Typ
- Soft recovery diode

(Applications)

Inverter for motor control (VVVF)
UPS, AC servo
DC power supply, Welder





Unit : mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

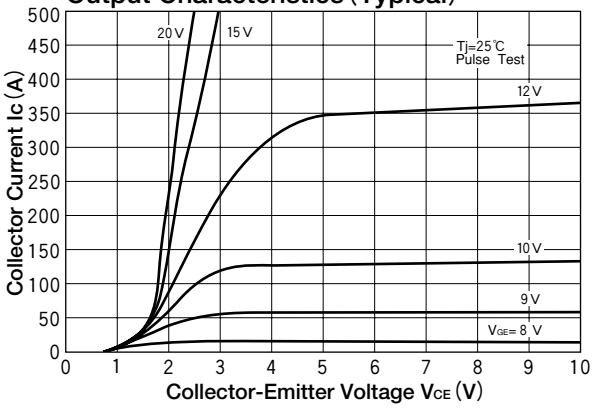
Symbol	Item		Conditions	Ratings	Unit
				GCA300BA60	
V_{CES}	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
V_{GES}	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		300	A
I_{CP}		Pulse (1 ms)		600	
−Ic	Reverse Collector Current			300	A
Pc	Total Power Dissipation		Tc=25℃	1100	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
V_{ISO}	Isolation Voltage (R.M.S.)		A.C. 1 minute	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	225	g

■Electrical Characteristics

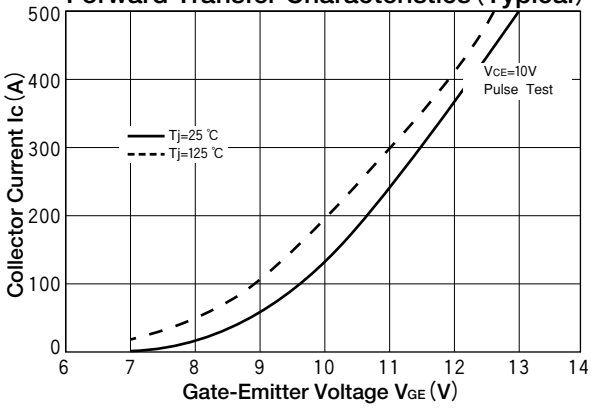
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
I_{GES}	Gate Leakage Current		V_{GE}=±20V, V_{CE}=0V			±500	nA
I_{CES}	Collector Cut-Off Current		V_{CE}=600V, V_{GE}=0V			1.0	mA
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage		V_{GE}=0V, Ic= 1 mA	600			V
$V_{GE(th)}$	Gate Threshold Voltage		V_{CE}=10V, Ic=30mA	3.0		7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage		Ic=300A, V_{GE}=15V		2.4	2.8	V
Cies	Input Capacitance		V_{CE}=10V, V_{GE}=0V, f=1MHz		20	30	nF
tr	Switching Time	Rise Time	Ic=300A, V_{GE}=+15V/−5V Vcc=300V, R_G=2Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
V_{ECS}	Emitter-Collector Voltage		−Ic=300A, V_{GE}=0V		2.30	2.80	V
trr	Reverse Recovery Time		−Ic=300A, V_{GE}=−10V, di/dt=600A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.11	℃/W
			Diode-Case			0.40	

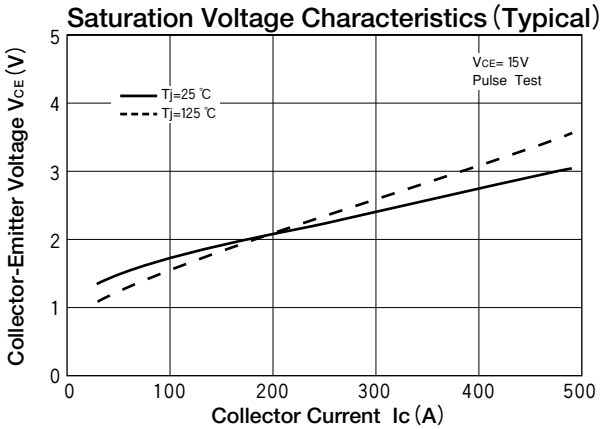
Output Characteristics (Typical)



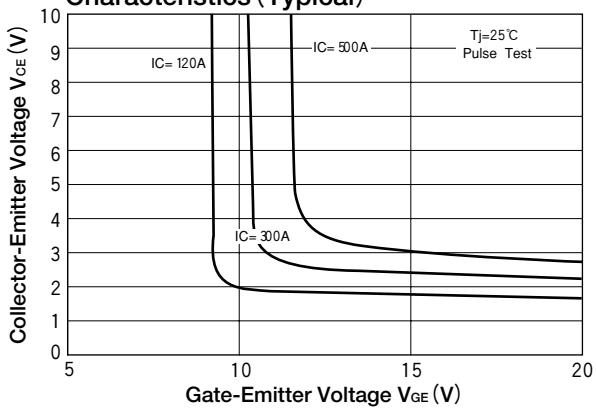
Forward Transfer Characteristics (Typical)



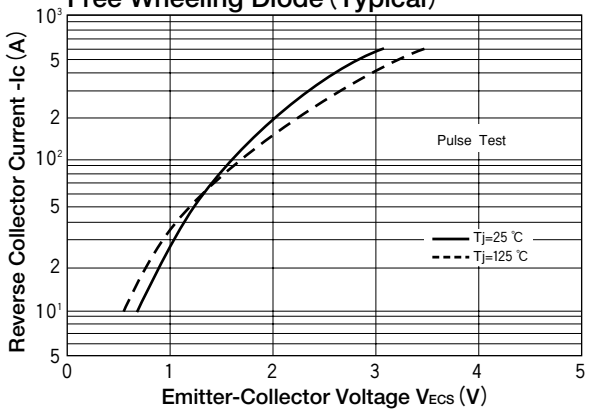
Saturation Voltage Characteristics (Typical)



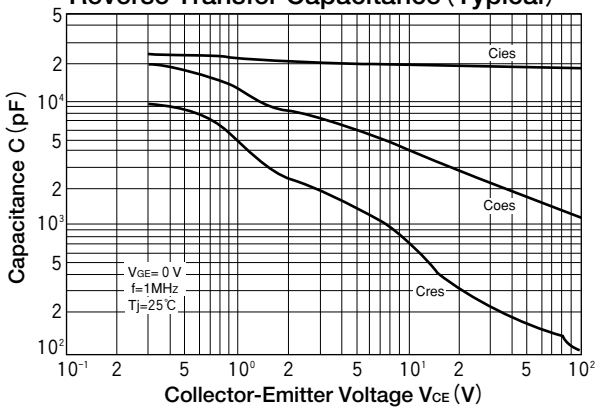
Collector-Emitter Saturation Voltage Characteristics (Typical)



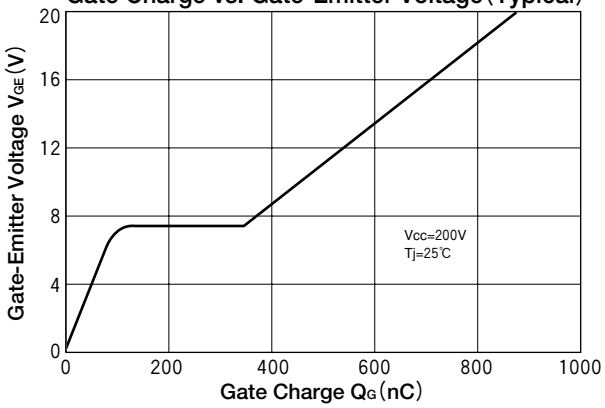
Forward Voltage of Free Wheeling Diode (Typical)



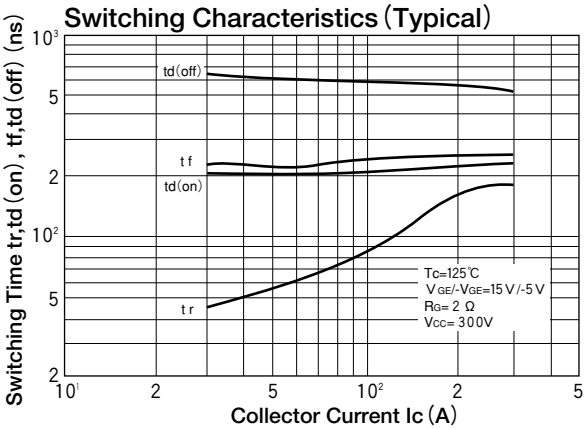
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



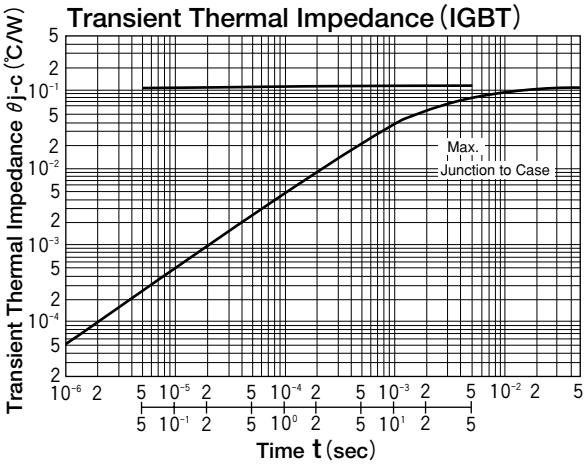
Gate Charge vs. Gate-Emitter Voltage (Typical)



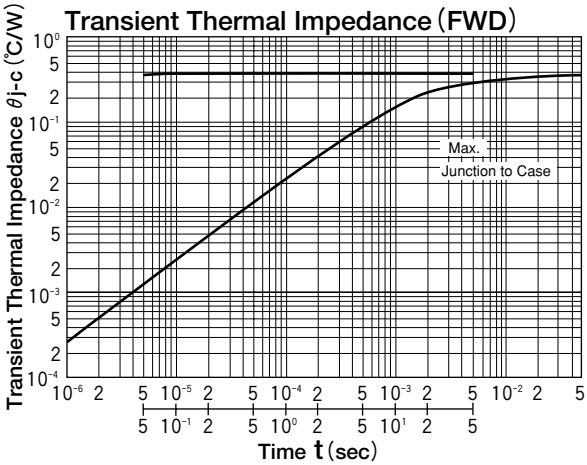
Switching Characteristics (Typical)



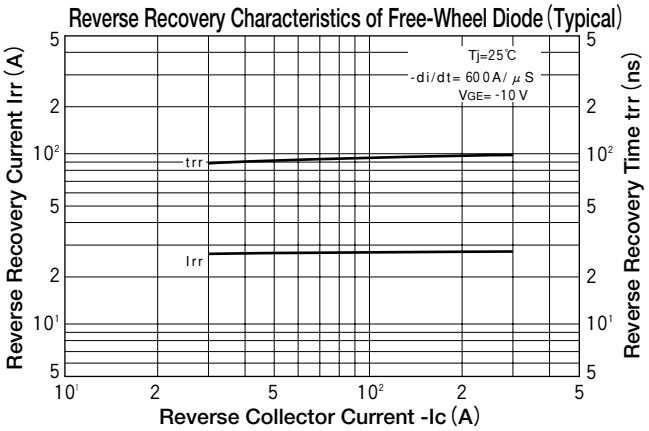
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA75AA120

UL;E76102(M)

SanRex IGBT Module **GCA75AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

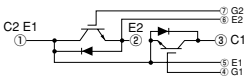
- Ic=75A　VCES=1200V
- VCE(sat) =3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

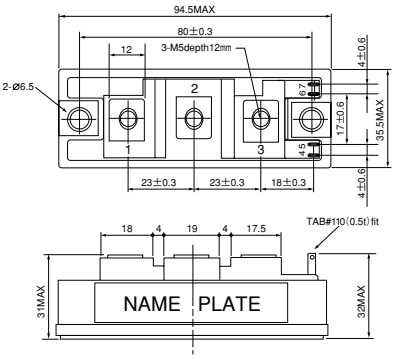
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

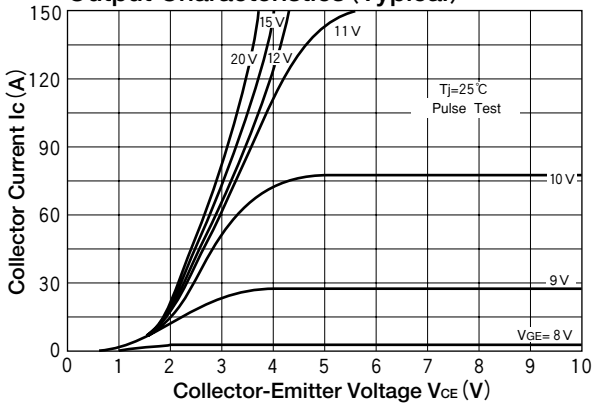
Symbol	Item		Conditions	Ratings	Unit
				GCA75AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		75	A
ICP		Pulse（1 ms）		150	
−Ic	Reverse Collector Current			75	A
Pc	Total Power Dissipation		Tc=25℃	600	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	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

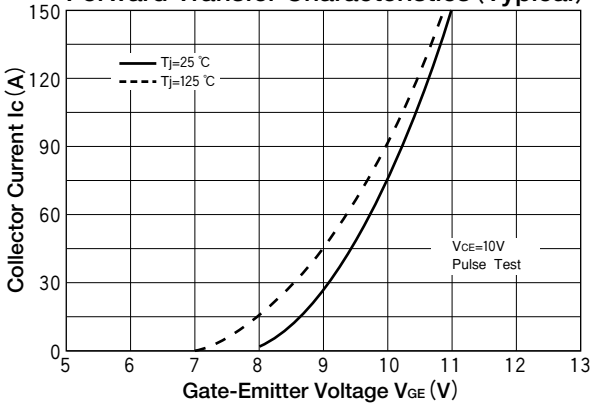
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=7.5mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=75A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		8	15	nF
tr	Switching Time	Rise Time	Ic=75A, VGE=+15V/−5V Vcc=600V, RG=4.2Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.20	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.25	0.30	
VECS	Emitter-Collector Voltage		−Ic=75A, VGE=0V		2.50	3.50	V
trr	Reverse Recovery Time		−Ic=75A, VGE=−10V, di/dt=150A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.21	℃/W
			Diode-Case			0.60	

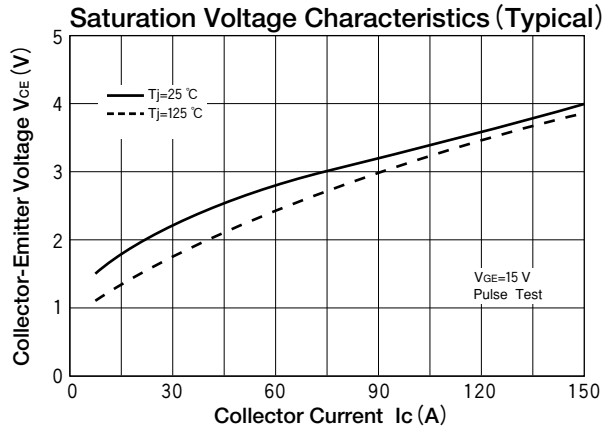
Output Characteristics (Typical)



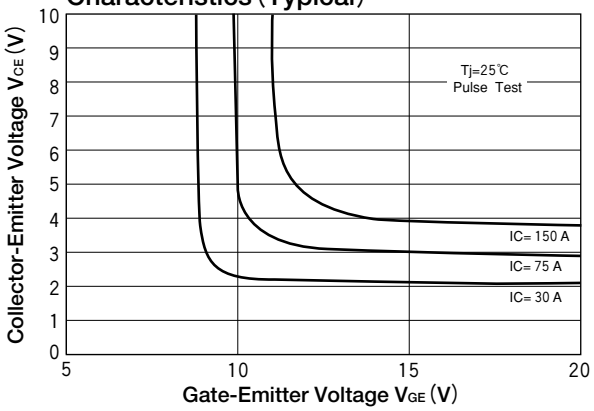
Forward Transfer Characteristics (Typical)



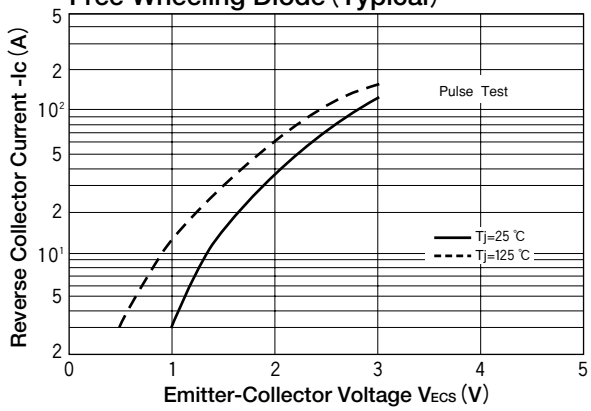
Saturation Voltage Characteristics (Typical)



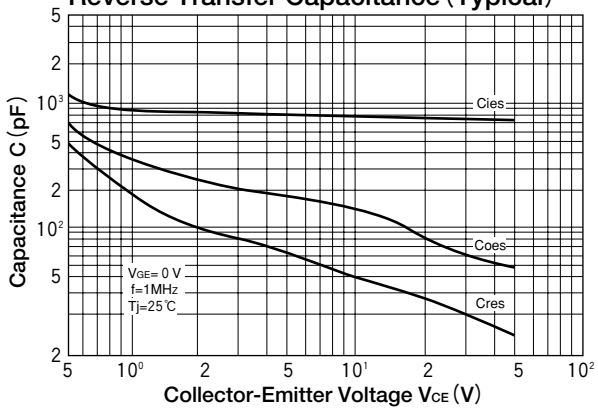
Collector-Emitter Saturation Voltage Characteristics (Typical)



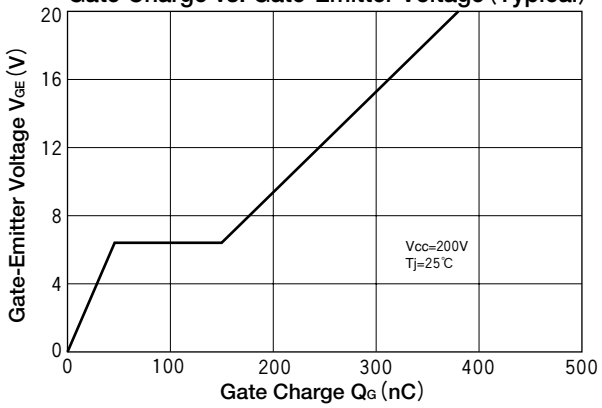
Forward Voltage of Free Wheeling Diode (Typical)



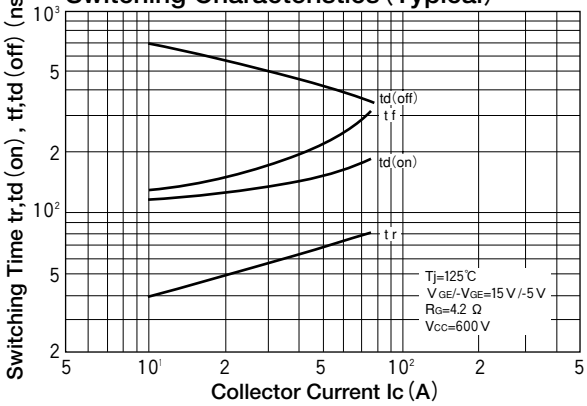
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



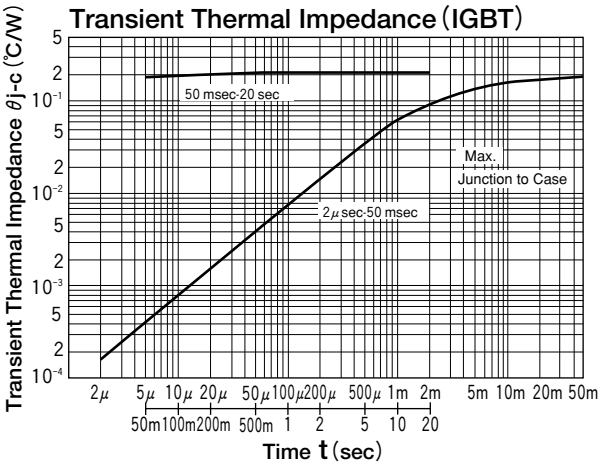
Gate Charge vs. Gate-Emitter Voltage (Typical)



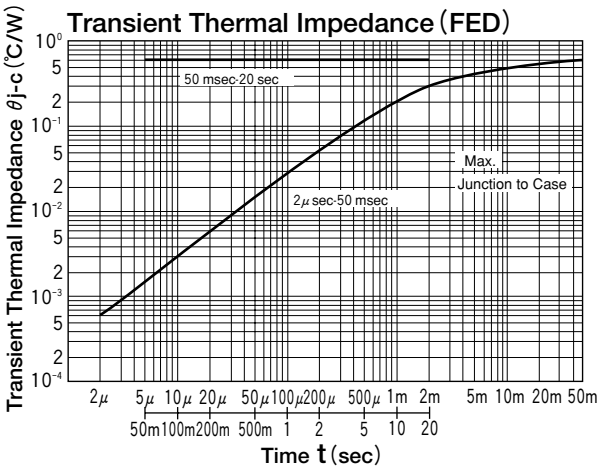
Switching Characteristics (Typical)



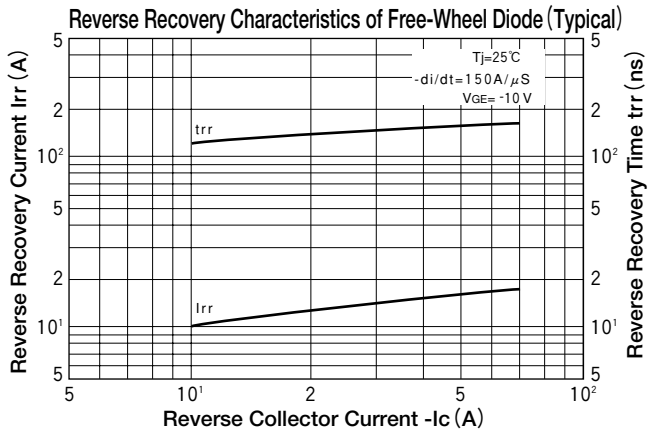
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FED)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA100AA120

UL;E76102(M)

SanRex IGBT Module **GCA100AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

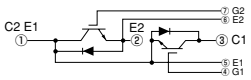
- Ic=100A　VCES=1200V
- VCE(sat) =3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

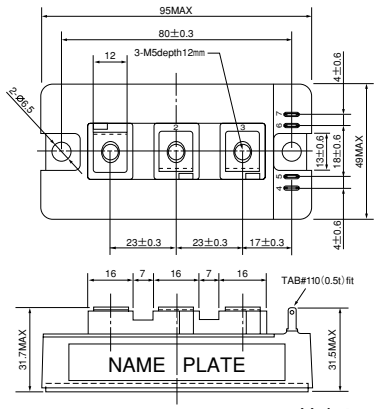
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

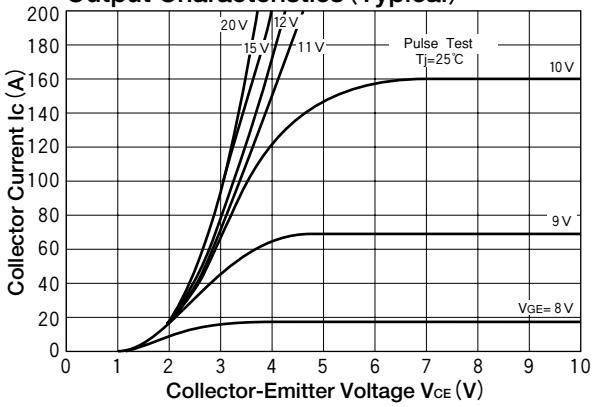
Symbol	Item		Conditions	Ratings	Unit
				GCA100AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		100	A
ICP		Pulse (1 ms)		200	
−Ic	Reverse Collector Current			100	A
Pc	Total Power Dissipation		Tc=25℃	780	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	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	225	g

■Electrical Characteristics

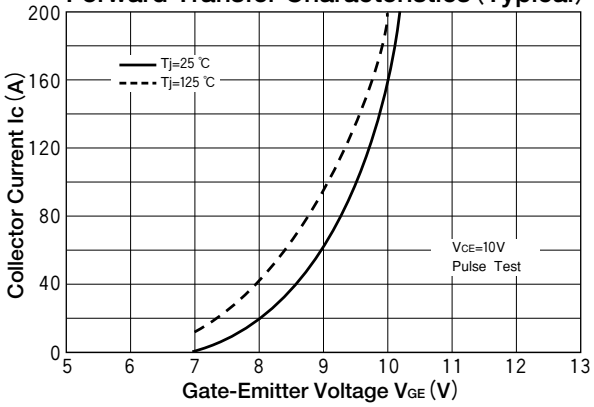
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=10mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=100A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		11	20	nF
tr	Switching Time	Rise Time	Ic=100A, VGE=+15V/−5V Vcc=600V, RG=3.0Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.20	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.25	0.40	
VECS	Emitter-Collector Voltage		−Ic=100A, VGE=0V		2.20	3.50	V
trr	Reverse Recovery Time		−Ic=100A, VGE=−10V, di/dt=200A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.16	℃/W
			Diode-Case			0.40	

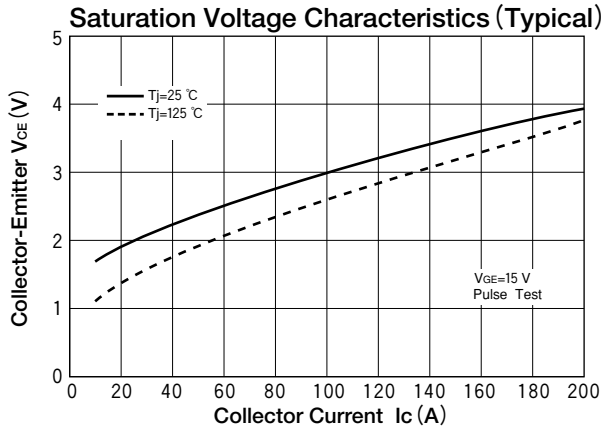
Output Characteristics (Typical)



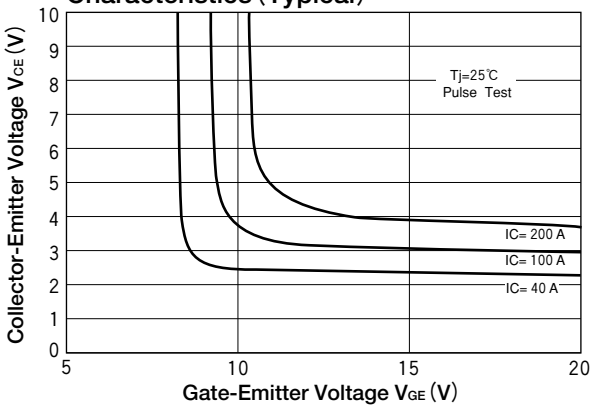
Forward Transfer Characteristics (Typical)



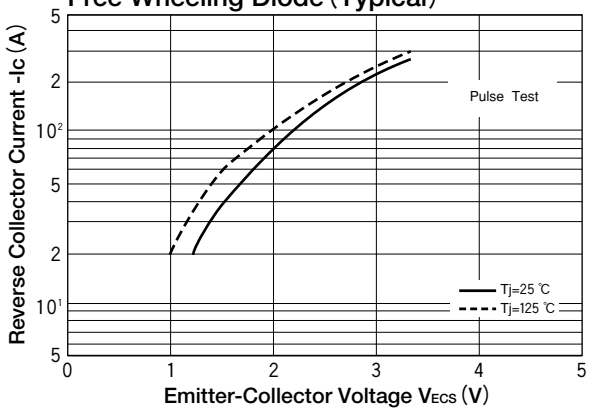
Saturation Voltage Characteristics (Typical)



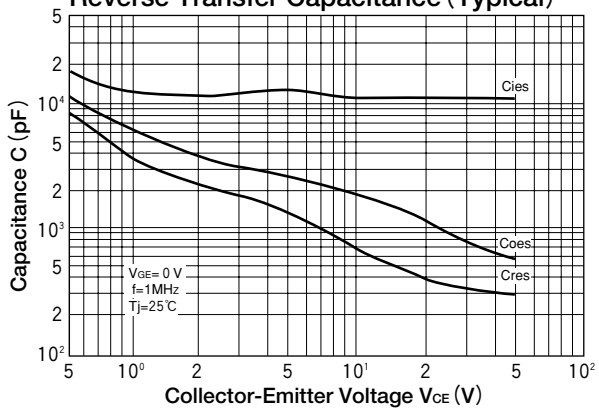
Collector-Emitter Saturation Voltage Characteristics (Typical)



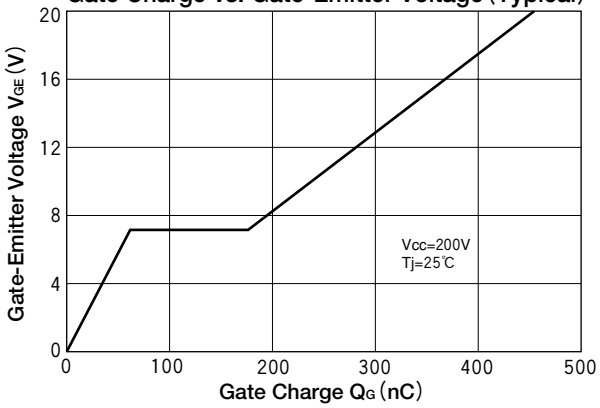
Forward Voltage of Free Wheeling Diode (Typical)



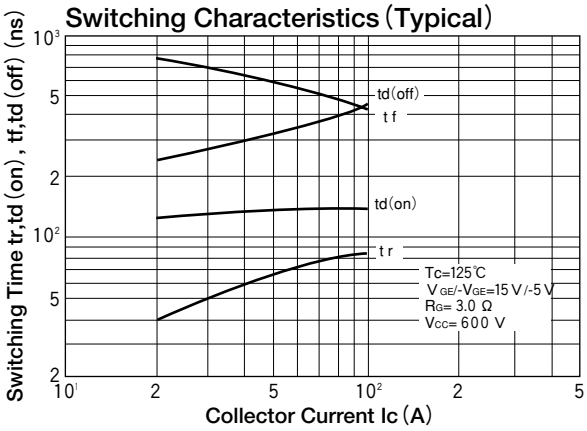
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



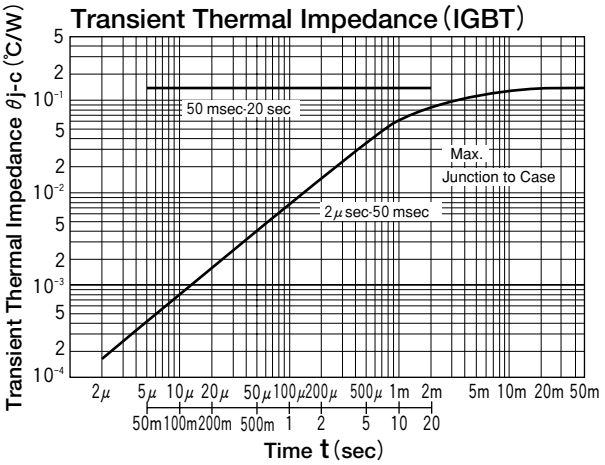
Gate Charge vs. Gate-Emitter Voltage (Typical)



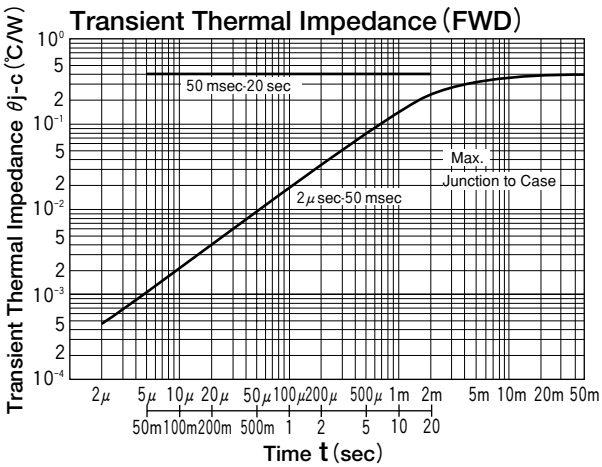
Switching Characteristics (Typical)



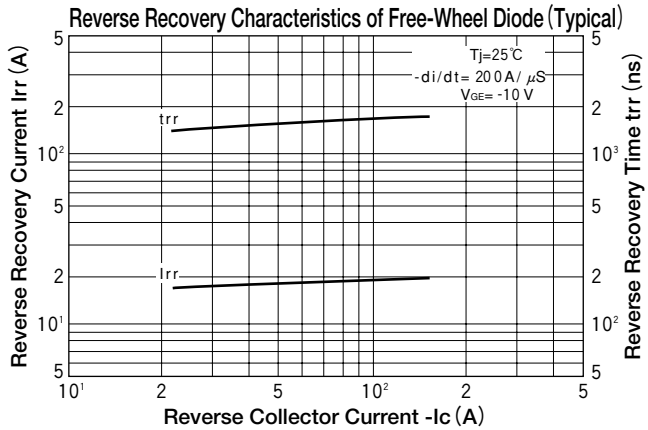
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA150AA120

UL;E76102(M)

SanRex IGBT Module **GCA150AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

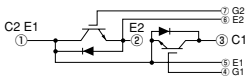
- Ic=150A　VCES=1200V
- VCE(sat) =3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

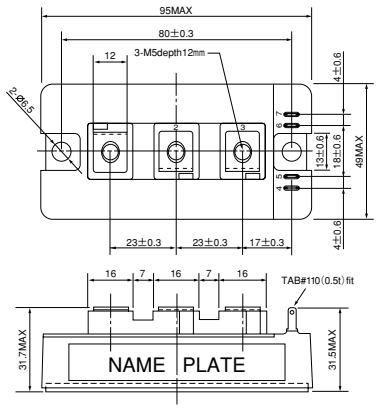
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

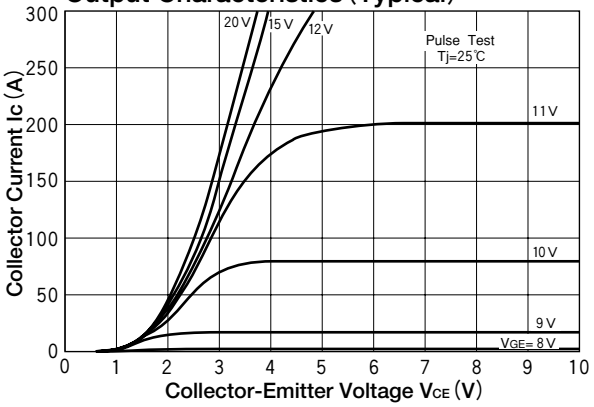
Symbol	Item		Conditions	Ratings	Unit
				GCA150AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		150	A
ICP		Pulse (1 ms)		300	
−Ic	Reverse Collector Current			150	A
Pc	Total Power Dissipation		Tc=25℃	1100	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	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	225	g

■Electrical Characteristics

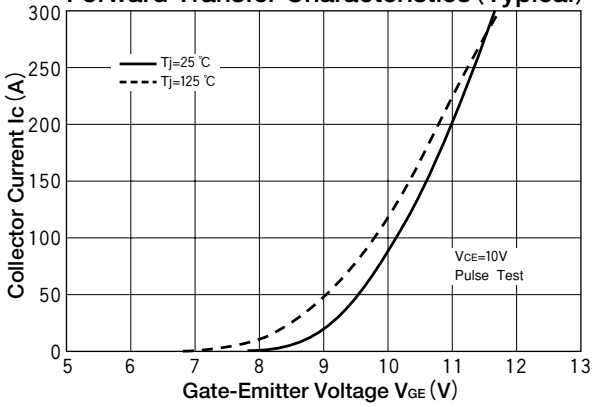
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=15mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=150A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		17	30	nF
tr	Switching Time	Rise Time	Ic=150A, VGE=+15V/−5V Vcc=600V, RG=2.1Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.15	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.25	0.50	
VECS	Emitter-Collector Voltage		−Ic=150A, VGE=0V		2.40	3.50	V
trr	Reverse Recovery Time		−Ic=150A, VGE=−10V, di/dt=300A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.11	℃/W
			Diode-Case			0.30	

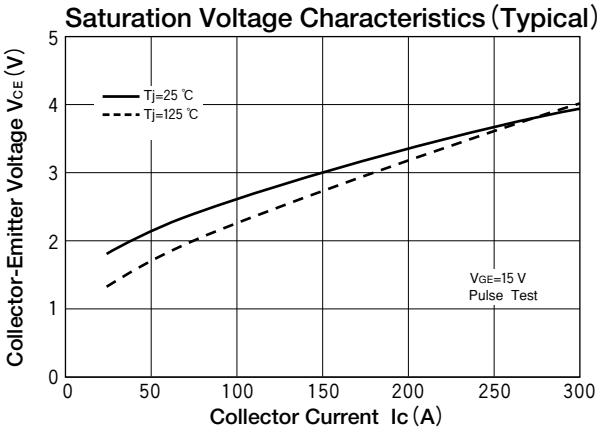
Output Characteristics (Typical)



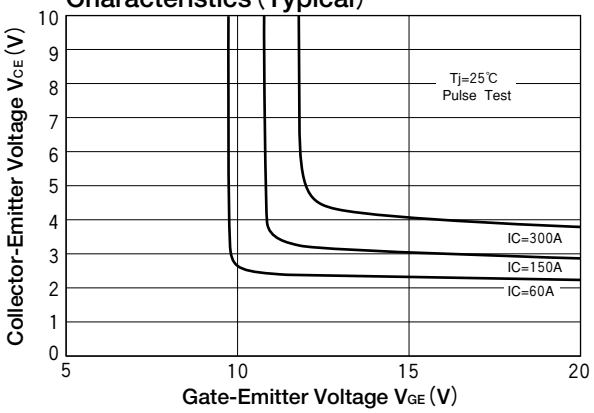
Forward Transfer Characteristics (Typical)



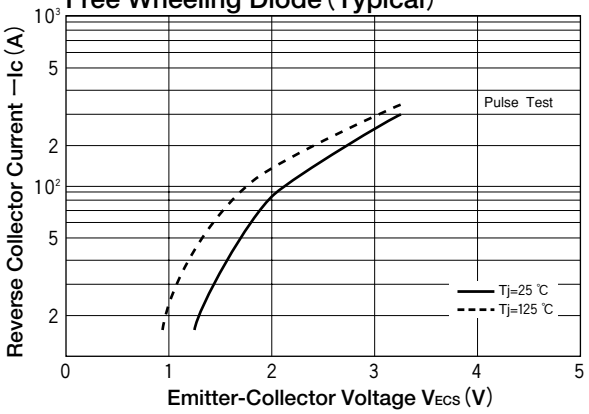
Saturation Voltage Characteristics (Typical)



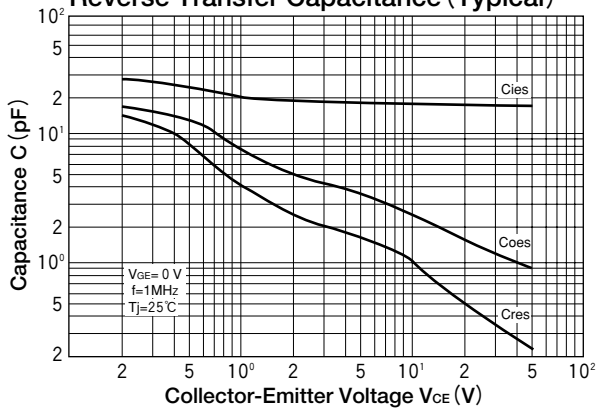
Collector-Emitter Saturation Voltage Characteristics (Typical)



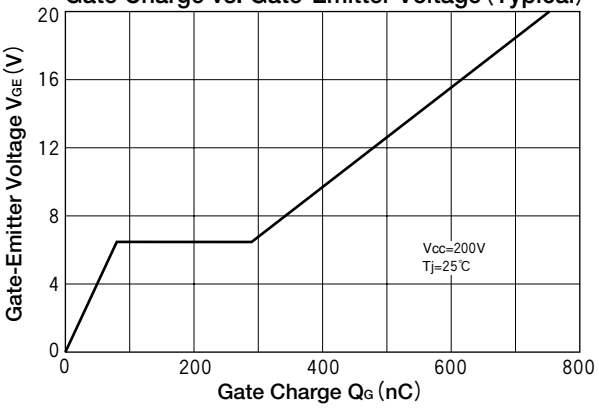
Forward Voltage of Free Wheeling Diode (Typical)



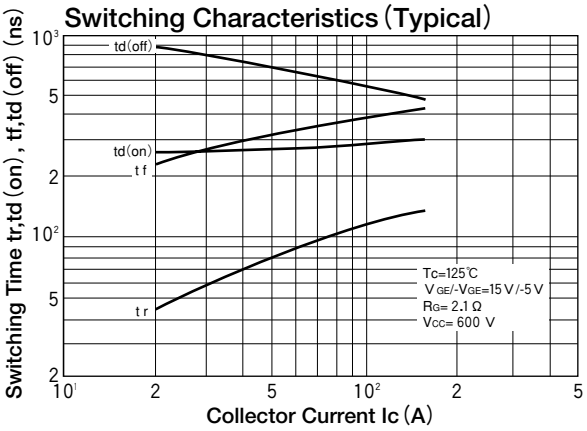
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



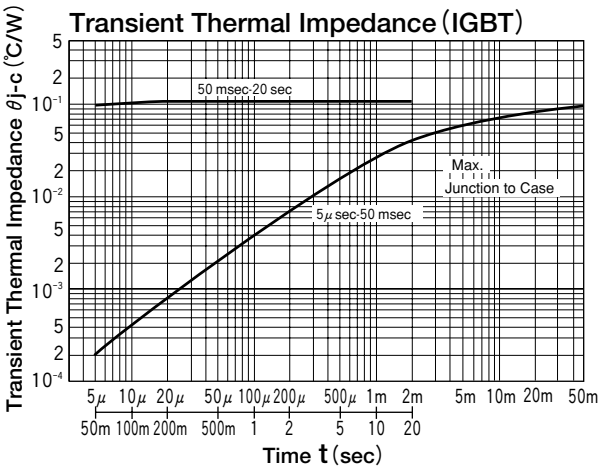
Gate Charge vs. Gate-Emitter Voltage (Typical)



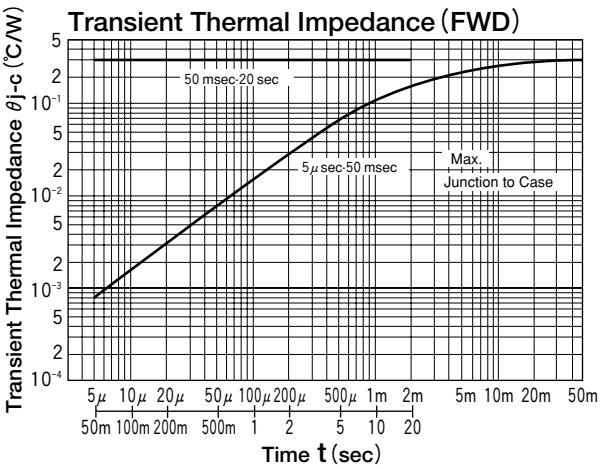
Switching Characteristics (Typical)



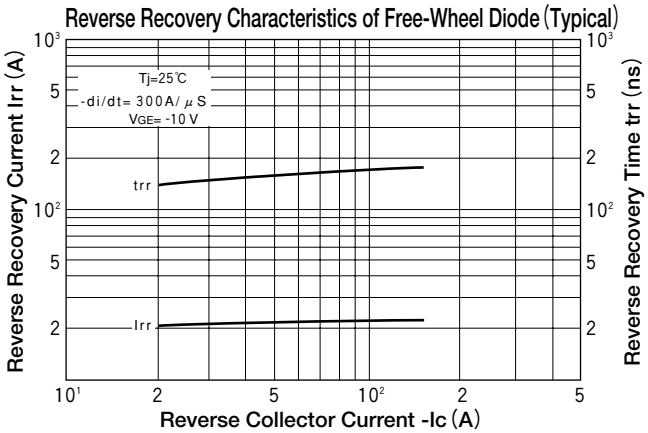
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GCA200AA120

UL;E76102(M)

SanRex IGBT Module **GCA200AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

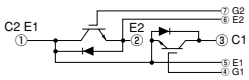
- Ic=200A　VCES=1200V
- VCE(sat) =3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

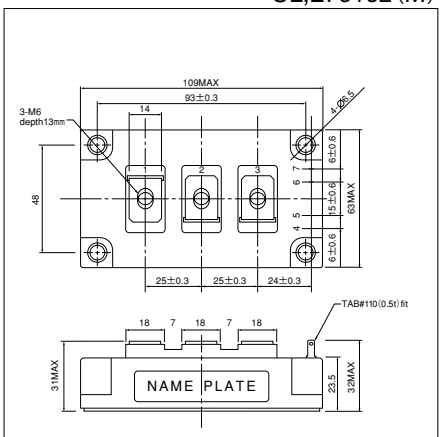
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

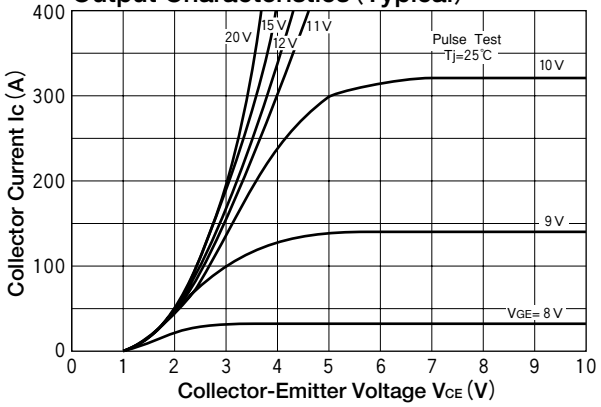
Symbol	Item		Conditions	Ratings	Unit
				GCA200AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		200	A
ICP		Pulse（1 ms）		400	
−Ic	Reverse Collector Current			200	A
Pc	Total Power Dissipation		Tc=25℃	1500	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	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	400	g

■Electrical Characteristics

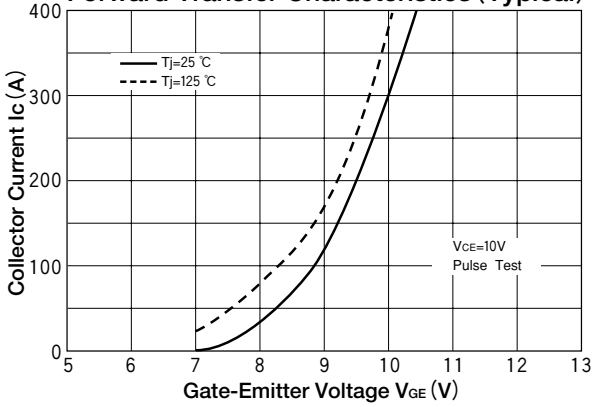
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=20mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=200A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		20	40	nF
tr	Switching Time	Rise Time	Ic=200A, VGE=+15V/−5V Vcc=600V, RG=1.6Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.15	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.35	0.50	
VECS	Emitter-Collector Voltage		−Ic=200A, VGE=0V		2.20	3.50	V
trr	Reverse Recovery Time		−Ic=200A, VGE=−10V, di/dt=400A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.08	℃/W
			Diode-Case			0.20	

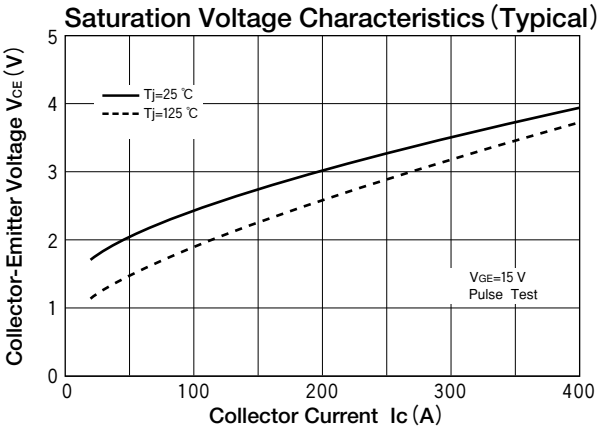
Output Characteristics (Typical)



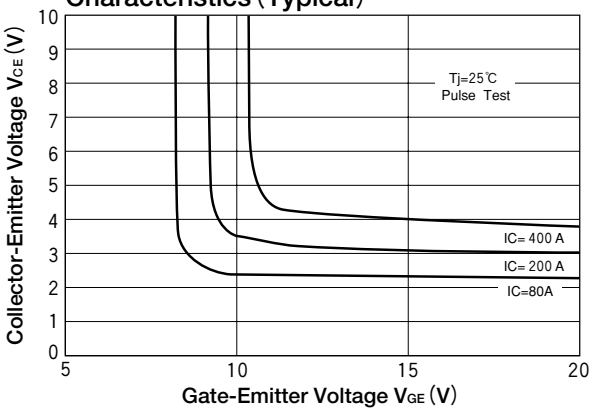
Forward Transfer Characteristics (Typical)



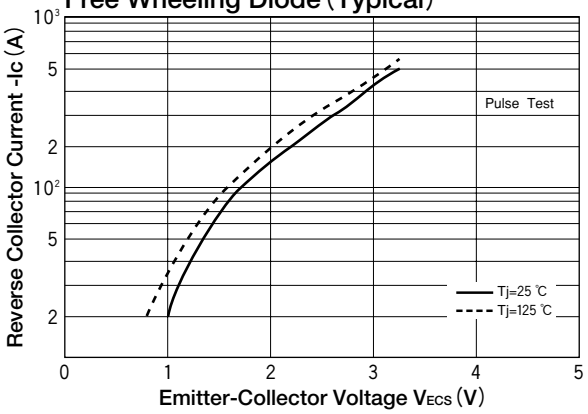
Saturation Voltage Characteristics (Typical)



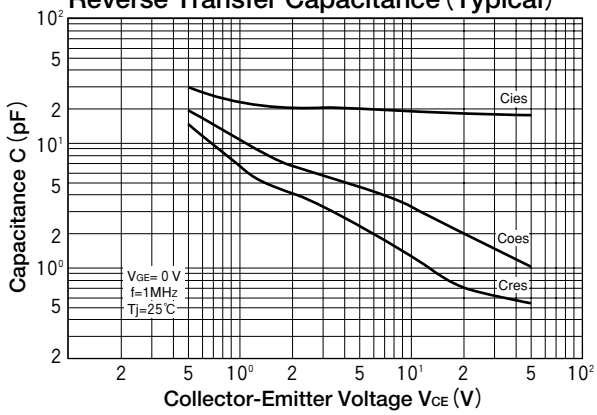
Collector-Emitter Saturation Voltage Characteristics (Typical)

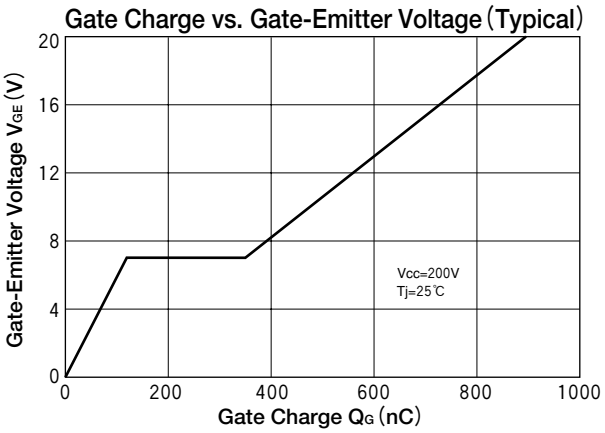


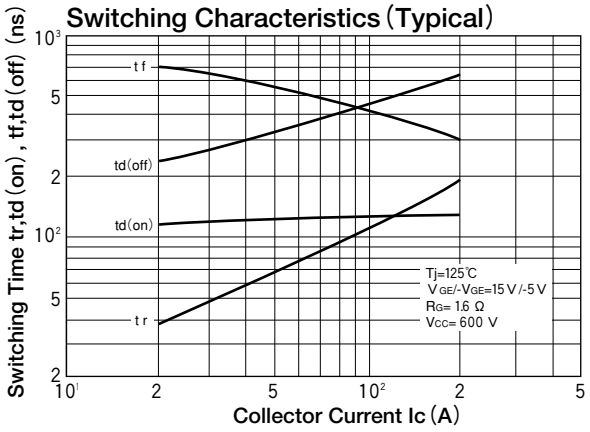
Forward Voltage of Free Wheeling Diode (Typical)

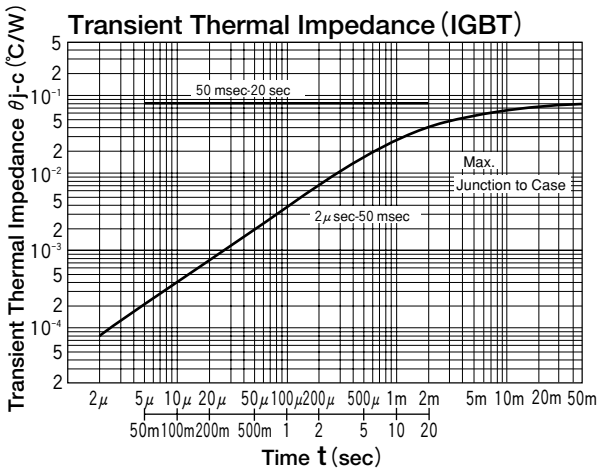


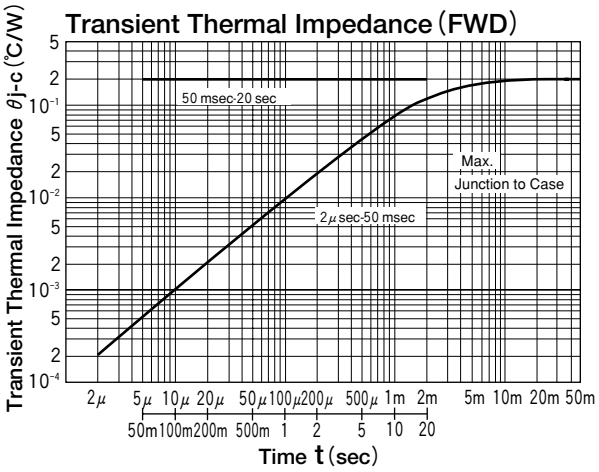
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)

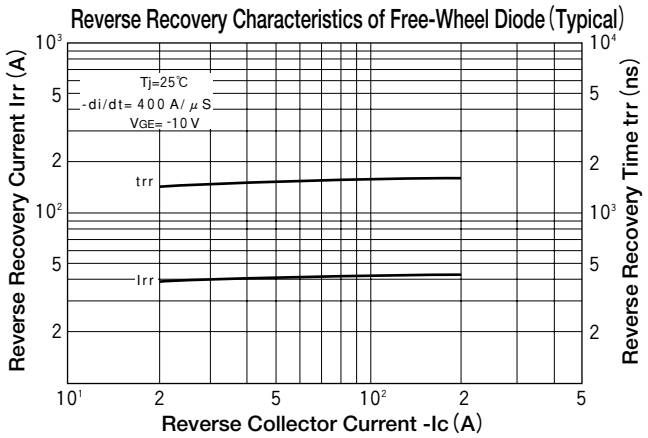



Gate Charge vs. Gate-Emitter Voltage (Typical)
Gate-Emitter Voltage VGE (V)
Gate Charge QG (nC)
Vcc=200V
Tj=25℃


Switching Characteristics (Typical)
Switching Time tr,td (on), tf,td (off) (ns)
Collector Current Ic (A)
tf
td(off)
td(on)
tr
Tj=125℃
VGE/-VGE=15 V/-5 V
RG= 1.6 Ω
Vcc= 600 V


Transient Thermal Impedance (IGBT)
Transient Thermal Impedance θj-c (℃/W)
Time t (sec)
50 msec-20 sec
Max.
Junction to Case
2μsec-50 msec


Transient Thermal Impedance (FWD)
Transient Thermal Impedance θj-c (℃/W)
Time t (sec)
50 msec-20 sec
Max.
Junction to Case
2μsec-50 msec


Reverse Recovery Characteristics of Free-Wheel Diode (Typical)
Reverse Recovery Current Irr (A)
Reverse Recovery Time trr (ns)
Reverse Collector Current -Ic (A)
Tj=25℃
-di/dt= 400 A/μS
VGE= -10 V
trr
Irr

IGBT MODULE

GCA300AA120

UL;E76102(M)

SanRex IGBT Module **GCA300AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across each IGBT.

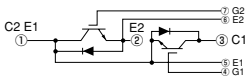
- Ic=300A　VCES=1200V
- VCE(sat) =3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

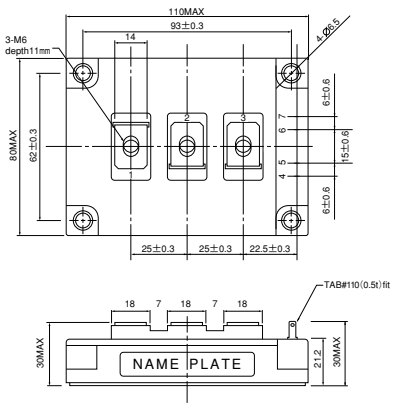
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

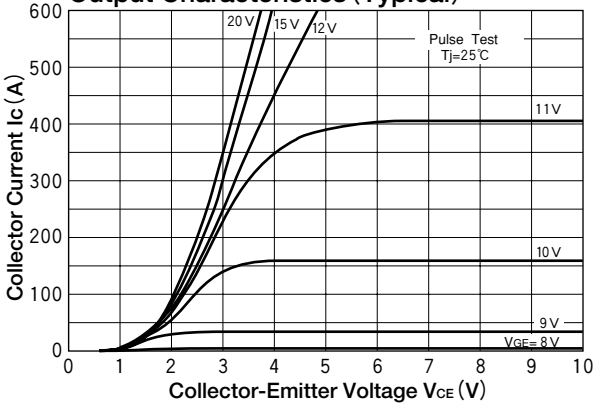
Symbol	Item		Conditions	Ratings	Unit
				GCA300AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		300	A
ICP		Pulse（1 ms）		600	
−Ic	Reverse Collector Current			300	A
Pc	Total Power Dissipation		Tc=25℃	2100	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	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	450	g

■Electrical Characteristics

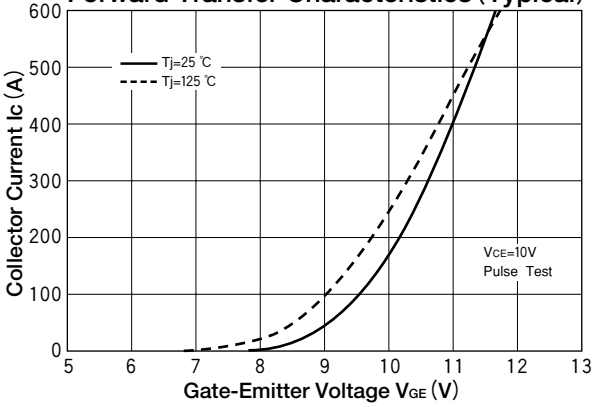
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic= 1 mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=30mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=300A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		30	60	nF
tr	Switching Time	Rise Time	Ic=300A, VGE=+15V/−5V Vcc=600V, RG=1.0Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.15	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.30	0.60	
VECS	Emitter-Collector Voltage		−Ic=300A, VGE=0V		2.50	3.50	V
trr	Reverse Recovery Time		−Ic=300A, VGE=−10V, di/dt=600A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.06	℃/W
			Diode-Case			0.15	

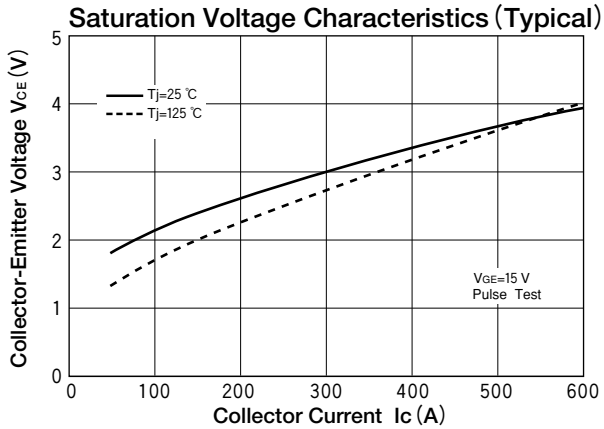
Output Characteristics (Typical)



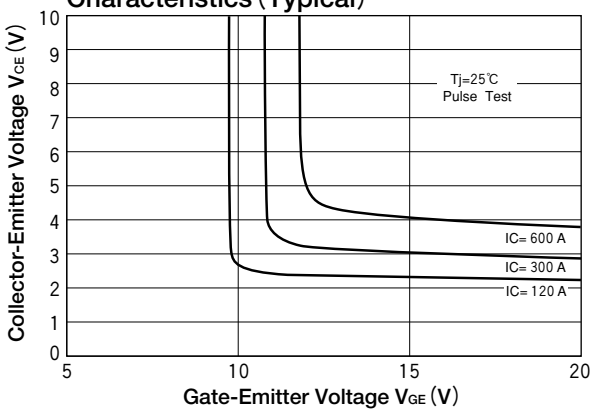
Forward Transfer Characteristics (Typical)



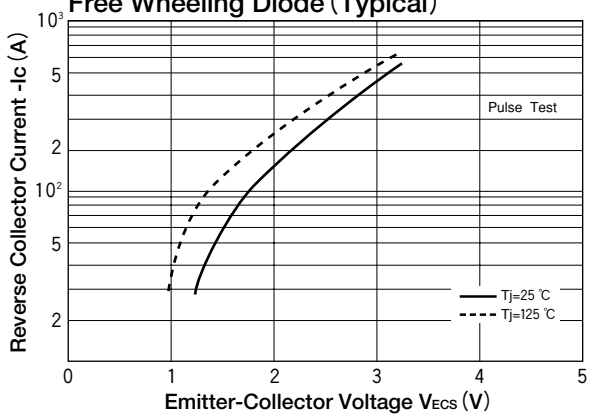
Saturation Voltage Characteristics (Typical)



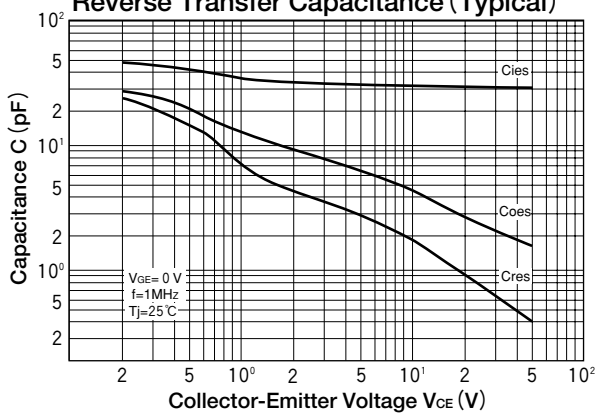
Collector-Emitter Saturation Voltage Characteristics (Typical)

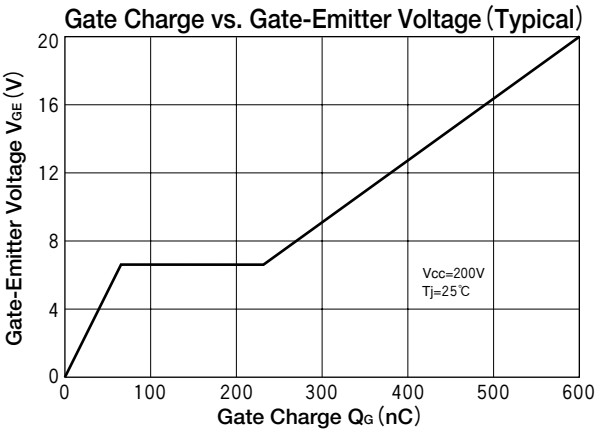


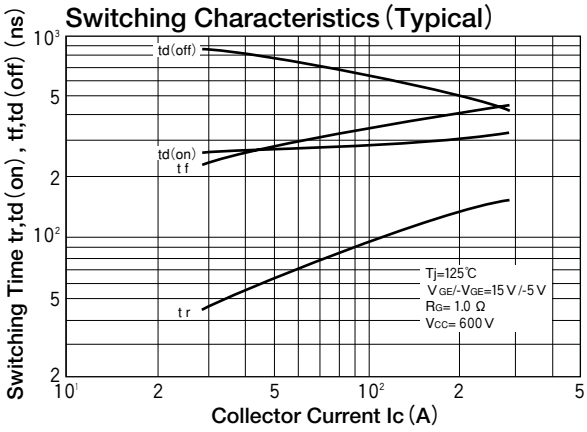
Forward Voltage of Free Wheeling Diode (Typical)

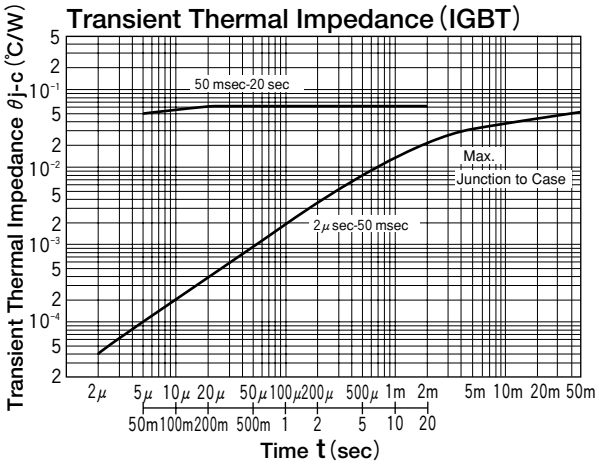


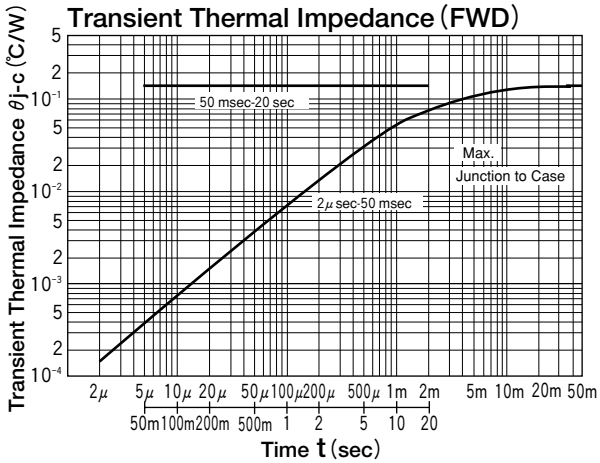
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)

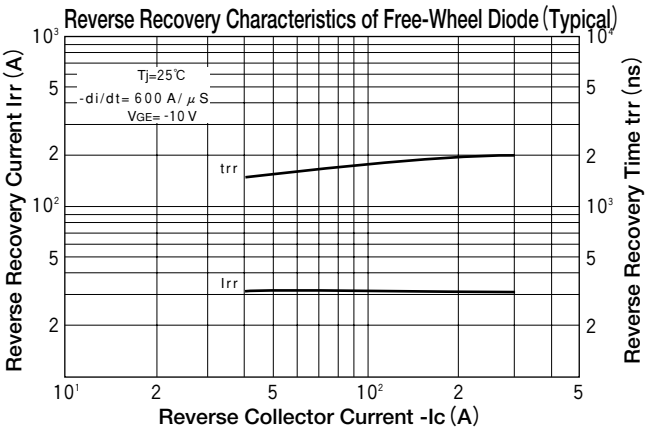



Gate Charge vs. Gate-Emitter Voltage (Typical)
Gate-Emitter Voltage VGE (V)
Gate Charge QG (nC)
Vcc=200V
Tj=25℃


Switching Characteristics (Typical)
Switching Time tr,td(on), tf,td(off) (ns)
Collector Current Ic (A)
td(off)
td(on)
tf
tr
Tj=125℃
VGE/-VGE=15 V/-5 V
RG= 1.0 Ω
Vcc= 600 V


Transient Thermal Impedance (IGBT)
Transient Thermal Impedance θj-c (℃/W)
Time t (sec)
50 msec-20 sec
Max.
Junction to Case
2μsec-50 msec


Transient Thermal Impedance (FWD)
Transient Thermal Impedance θj-c (℃/W)
Time t (sec)
50 msec-20 sec
Max.
Junction to Case
2μsec-50 msec


Reverse Recovery Characteristics of Free-Wheel Diode (Typical)
Reverse Recovery Current Irr (A)
Reverse Recovery Time trr (ns)
Reverse Collector Current -Ic (A)
Tj=25℃
-di/dt= 600 A/μS
VGE= -10 V
trr
Irr

IGBT MODULE

GSA400BA60

UL;E76102(M)

SanRex IGBT Module **GSA400BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across IGBT.

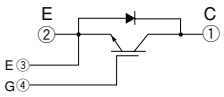
- Ic=400A　VCES=600V
- VCE(sat) =2.3V Typ
- tf=0.10 μs Typ
- Soft recovery diode

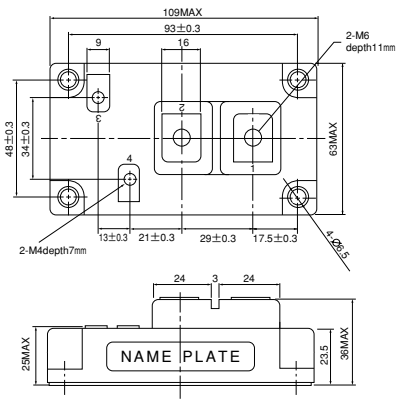
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

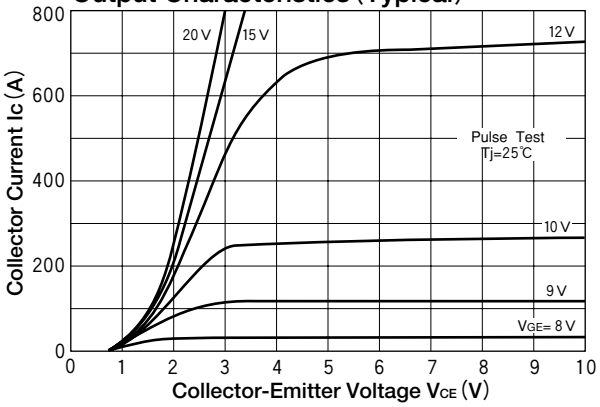
Symbol	Item		Conditions	Ratings	Unit
				GSA400BA60	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	600	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		400	A
ICP		Pulse (1 ms)		800	
−Ic	Reverse Collector Current			400	A
Pc	Total Power Dissipation		Tc=25℃	1500	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	2500	V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		Main Terminal (M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		G(E) Terminal (M4)	Recommended Value 1.0-1.4	1.5	N·m
			Recommended Value 10-14	15	(kgf·cm)
	Mass		Typical Value	400	g

■Electrical Characteristics

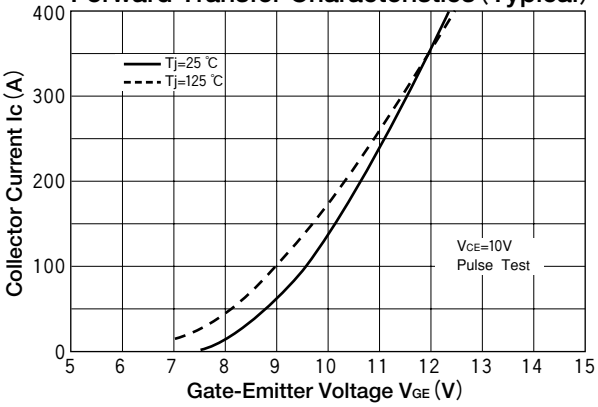
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=600V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic=1mA	600			V
VGE(th)	Gate Threshold Voltage		VCE=5V, Ic=40mA	3.0		7.0	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=400A, VGE=15V		2.3	2.8	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		32	40	nF
tr	Switching Time	Rise Time	Ic=400A, VGE=+15V/−5V Vcc=300V, RG=1.6Ω		0.10	0.20	μs
td(on)		Turn-on Delay Time			0.20	0.40	
tf		Fall Time			0.10	0.20	
td(off)		Turn-off Delay Time			0.40	0.80	
VECS	Emitter-Collector Voltage		−Ic=400A, VGE=0V		2.30	2.80	V
trr	Reverse Recovery Time		−Ic=400A, VGE=−10V, di/dt=800A/μs		0.1	0.15	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.08	℃/W
			Diode-Case			0.20	

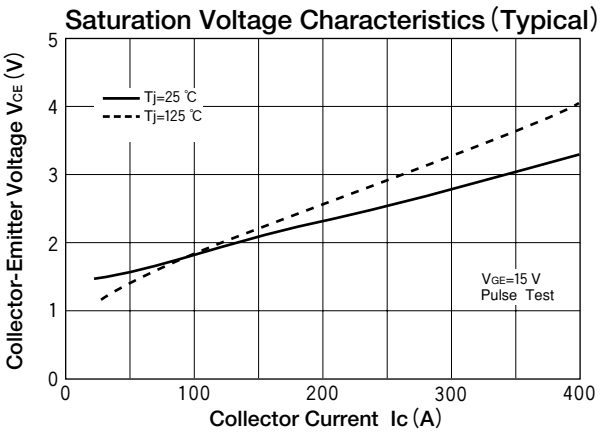
Output Characteristics (Typical)



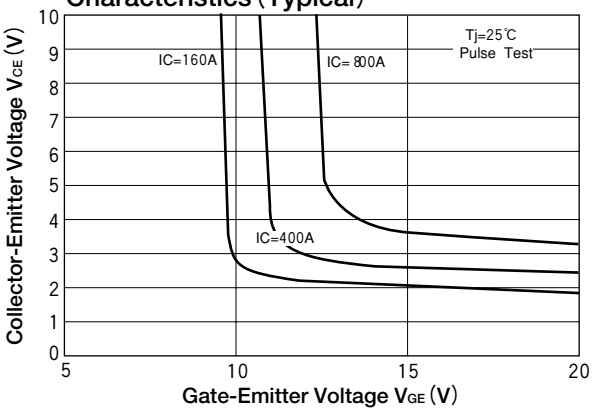
Forward Transfer Characteristics (Typical)



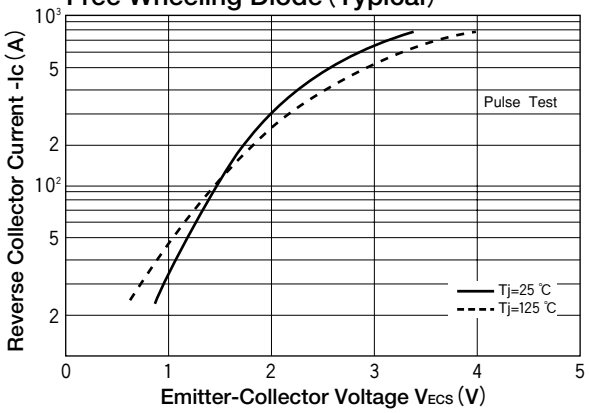
Saturation Voltage Characteristics (Typical)



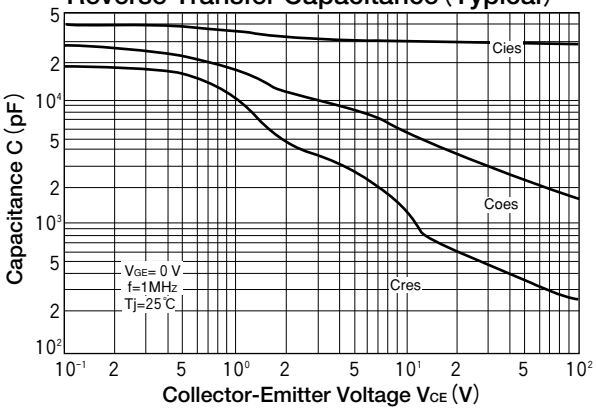
Collector-Emitter Saturation Voltage Characteristics (Typical)



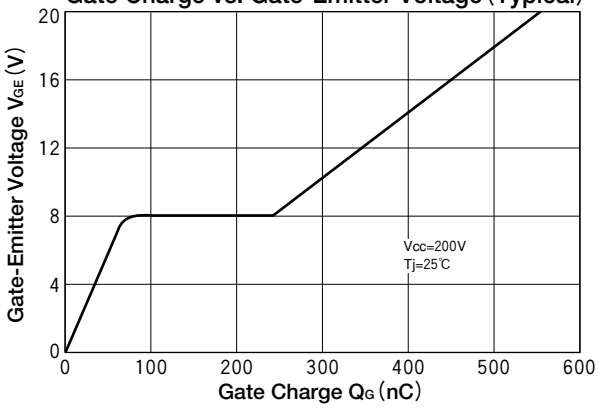
Forward Voltage of Free Wheeling Diode (Typical)



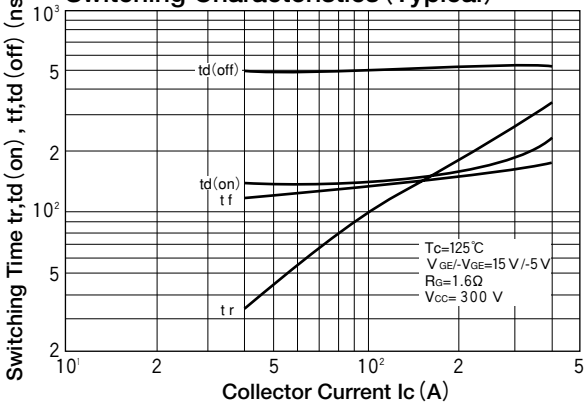
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



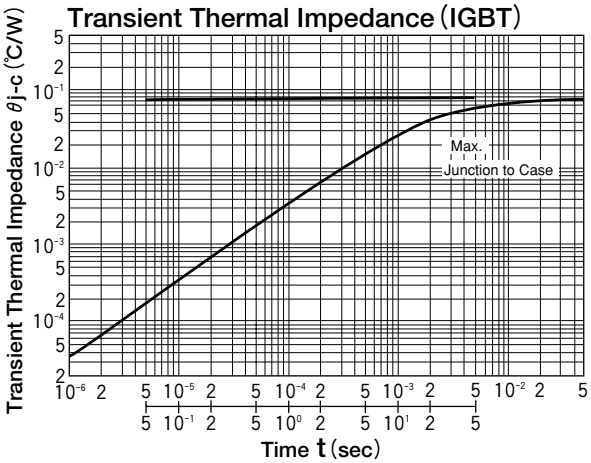
Gate Charge vs. Gate-Emitter Voltage (Typical)



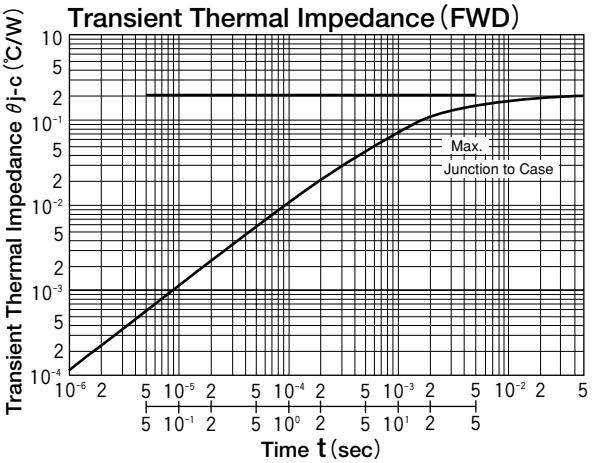
Switching Characteristics (Typical)



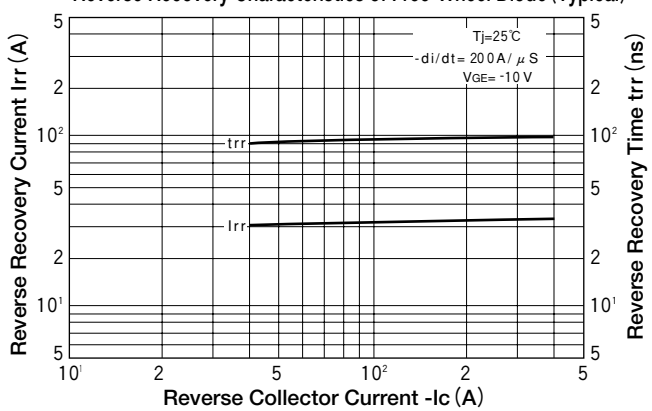
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



IGBT MODULE

GSA300AA120

UL;E76102(M)

SanRex IGBT Module **GSA300AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across IGBT.

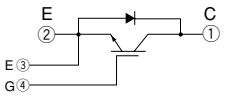
- Ic=300A VCES=1200V
- VCE〔sat〕=3.0V Typ
- tf=0.10 μs Typ
- Soft recovery diode

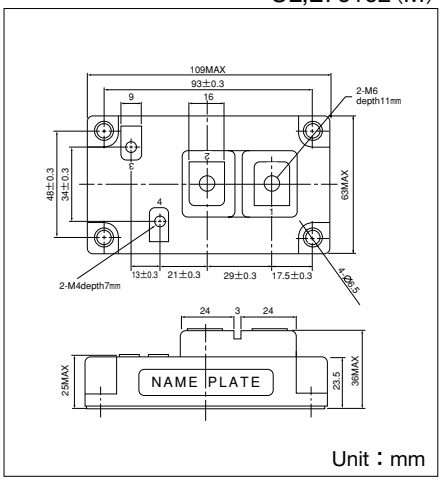
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





Unit：mm

■Maximum Ratings

(Tj=25℃ unless otherwise specified)

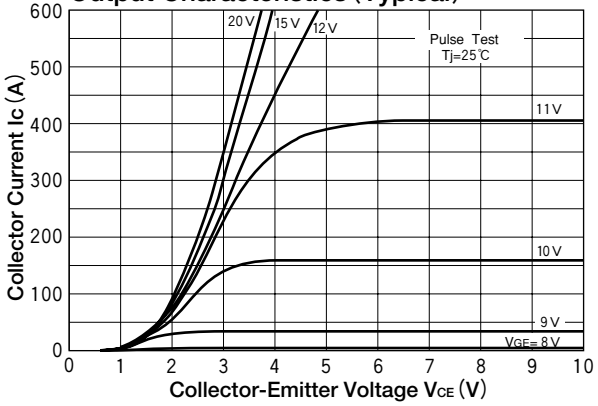
Symbol	Item		Conditions	Ratings	Unit
				GSA300AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		300	A
ICP		Pulse（1 ms）		600	
−Ic	Reverse Collector Current			300	A
Pc	Total Power Dissipation		Tc=25℃	2100	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage（R.M.S.）		A.C. 1 minute	2500	V
	Mounting Torque	Mounting(M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		Main Terminal (M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		G(E) Terminal（M4）	Recommended Value 1.0-1.4	1.5	N·m
			Recommended Value 10-14	15	(kgf·cm)
	Mass		Typical Value	400	g

■Electrical Characteristics

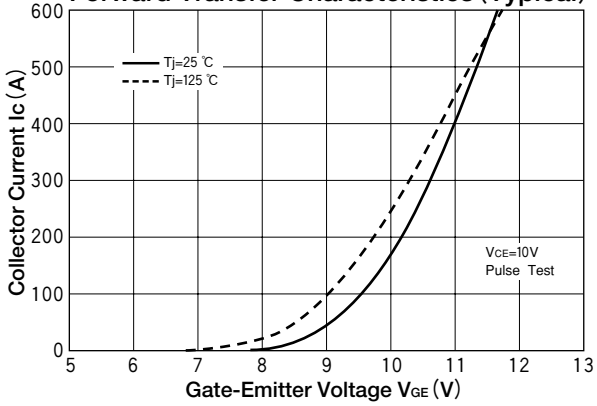
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			1.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic=1mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=30mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=300A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		35	60	nF
tr	Switching Time	Rise Time	Ic=300A, VGE=+15V/−5V Vcc=600V, RG=1.0Ω		0.10	0.25	μs
td(on)		Turn-on Delay Time			0.15	0.35	
tf		Fall Time			0.10	0.35	
td(off)		Turn-off Delay Time			0.30	0.60	
VECS	Emitter-Collector Voltage		−Ic=300A, VGE=0V		2.50	3.50	V
trr	Reverse Recovery Time		−Ic=300A, VGE=−10V, di/dt=600A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.06	℃/W
			Diode-Case			0.15	

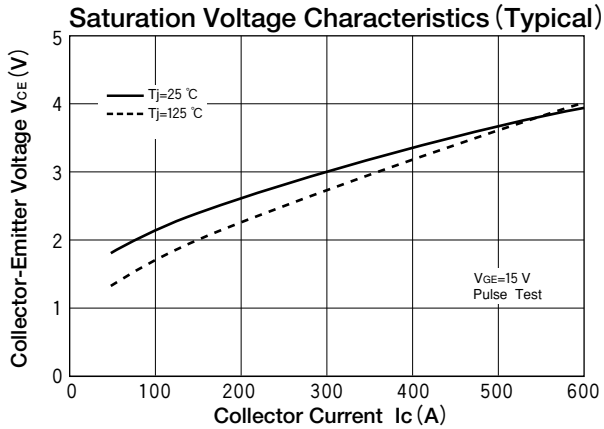
Output Characteristics (Typical)



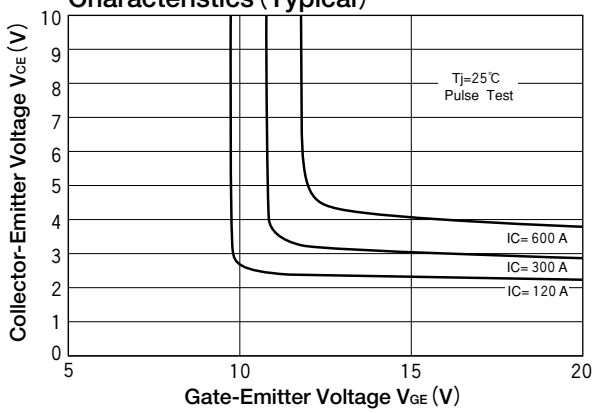
Forward Transfer Characteristics (Typical)



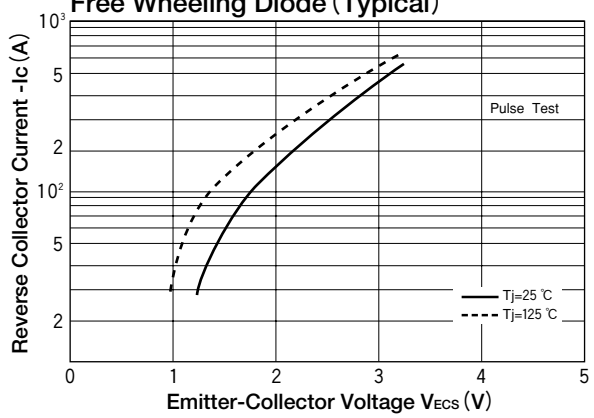
Saturation Voltage Characteristics (Typical)



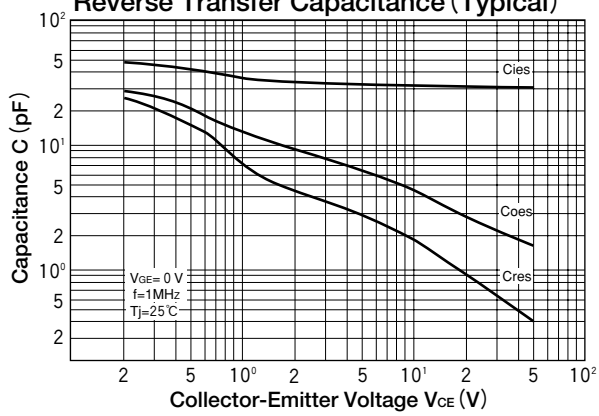
Collector-Emitter Saturation Voltage Characteristics (Typical)



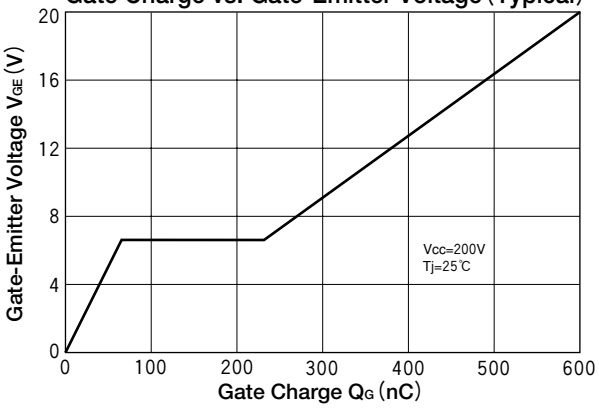
Forward Voltage of Free Wheeling Diode (Typical)



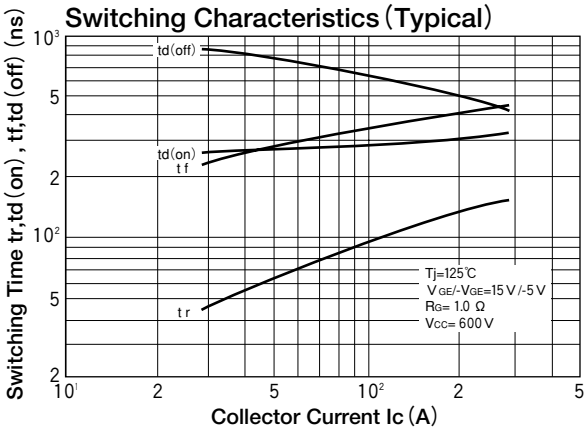
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



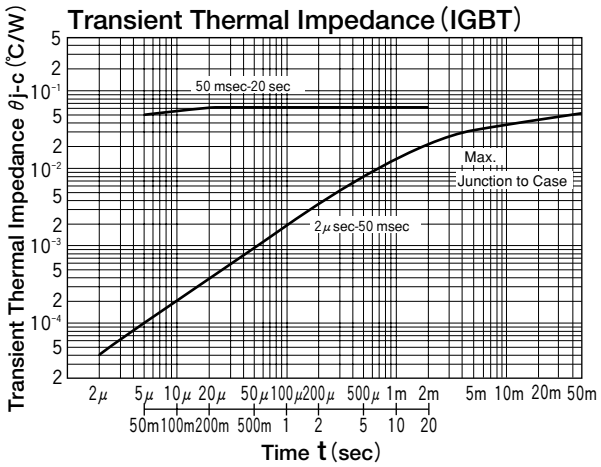
Gate Charge vs. Gate-Emitter Voltage (Typical)



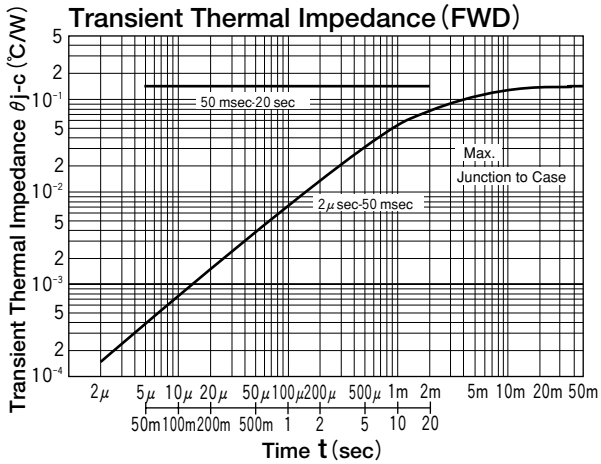
Switching Characteristics (Typical)



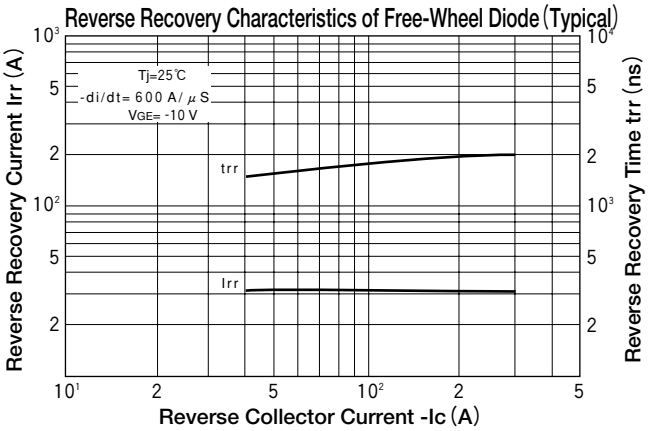
Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)



GSA400AA120

UL;E76102(M)

SanRex IGBT Module **GSA400AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and with a fast switching, soft recovery diode (trr=0.1 μs) reverse connected across IGBT.

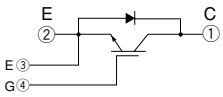
- Ic=400A VCES=1200V
- VCE〔sat〕=3.0V Typ
- tf=0.15 μs Typ
- Soft recovery diode

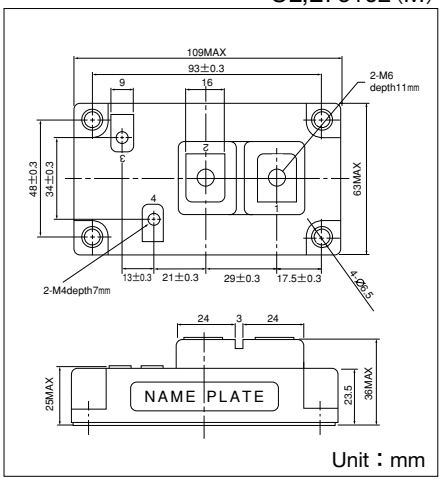
(Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder





■Maximum Ratings

(Tj=25℃ unless otherwise specified)

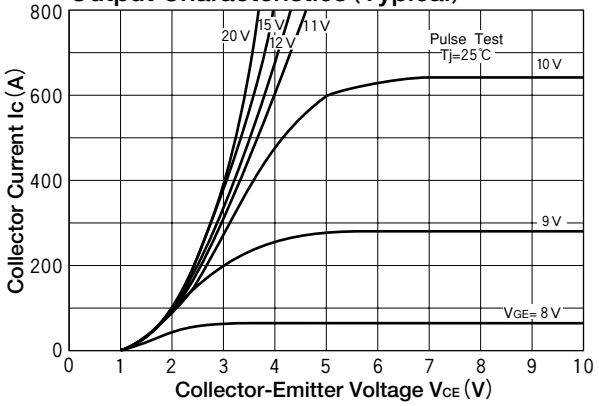
Symbol	Item		Conditions	Ratings	Unit
				GSA400AA120	
VCES	Collector-Emitter Voltage		with gate terminal shorted to emitter	1200	V
VGES	Gate-Emitter Voltage		with collector shorted to emitter	±20	V
Ic	Collector Current	DC		400	A
ICP		Pulse (1 ms)		800	
−Ic	Reverse Collector Current			400	A
Pc	Total Power Dissipation		Tc=25℃	2800	W
Tj	Junction Temperature			150	℃
Tstg	Storage Temperature			−40 to +125	℃
VISO	Isolation Voltage (R.M.S.)		A.C. 1 minute	2500	V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		Main Terminal (M6)	Recommended Value 2.5-3.9	4.7	N·m
			Recommended Value 25-40	48	(kgf·cm)
		G(E) Terminal (M4)	Recommended Value 1.0-1.4	1.5	N·m
			Recommended Value 10-14	15	(kgf·cm)
	Mass		Typical Value	400	g

■Electrical Characteristics

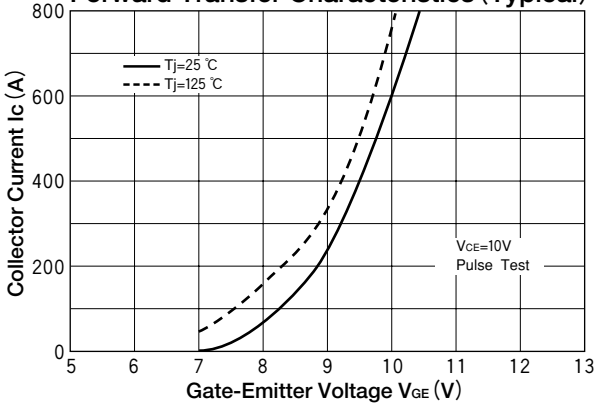
(Tj=25℃ unless otherwise specified)

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
IGES	Gate Leakage Current		VGE=±20V, VCE=0V			±500	nA
ICES	Collector Cut-Off Current		VCE=1200V, VGE=0V			2.0	mA
V(BR)CES	Collector-Emitter Breakdown Voltage		VGE=0V, Ic=2mA	1200			V
VGE(th)	Gate Threshold Voltage		VCE=10V, Ic=40mA	4.5		7.5	V
VCE(sat)	Collector-Emitter Saturation Voltage		Ic=400A, VGE=15V		3.0	3.4	V
Cies	Input Capacitance		VCE=10V, VGE=0V, f=1MHz		35	80	nF
tr	Switching Time	Rise Time	Ic=400A, VGE=+15V/−5V Vcc=600V, RG=0.78Ω		0.20	0.30	μs
td(on)		Turn-on Delay Time			0.25	0.35	
tf		Fall Time			0.15	0.35	
td(off)		Turn-off Delay Time			0.50	0.70	
VECS	Emitter-Collector Voltage		−Ic=400A, VGE=0V		2.40	3.50	V
trr	Reverse Recovery Time		−Ic=400A, VGE=−10V, di/dt=800A/μs		0.15	0.25	μs
Rth(j-c)	Thermal Resistance		IGBT-Case			0.04	℃/W
			Diode-Case			0.10	

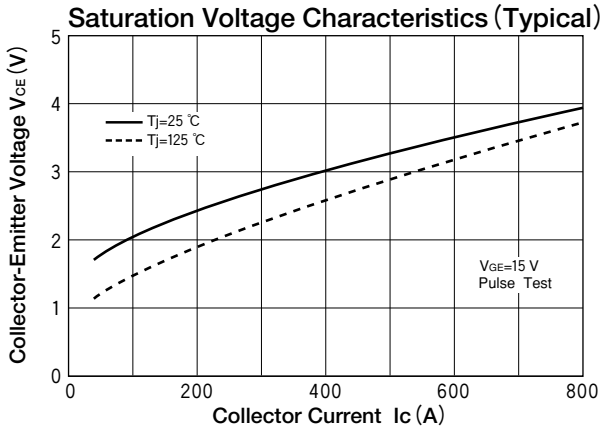
Output Characteristics (Typical)



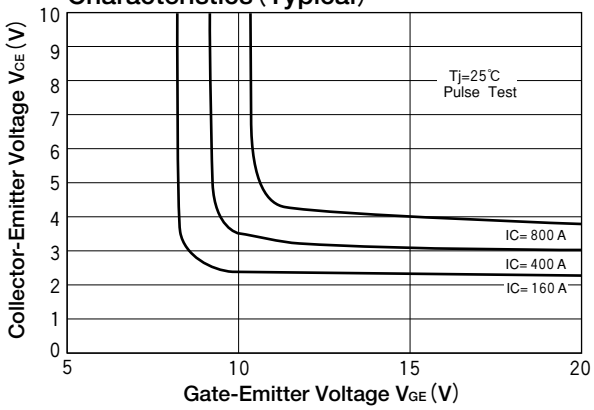
Forward Transfer Characteristics (Typical)



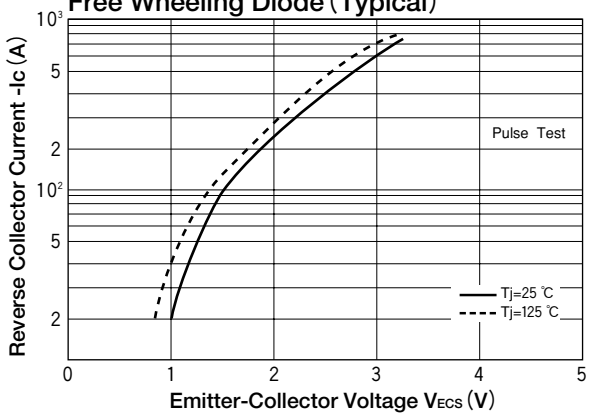
Saturation Voltage Characteristics (Typical)



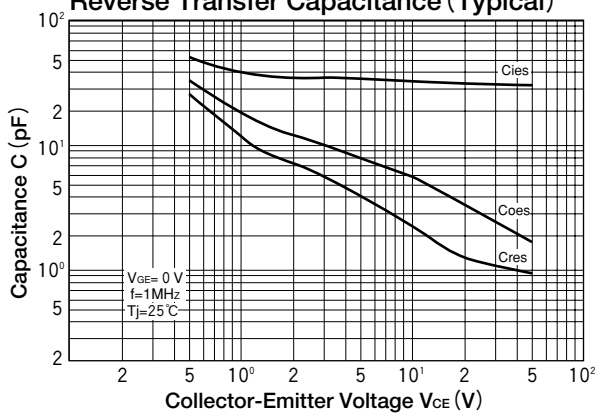
Collector-Emitter Saturation Voltage Characteristics (Typical)



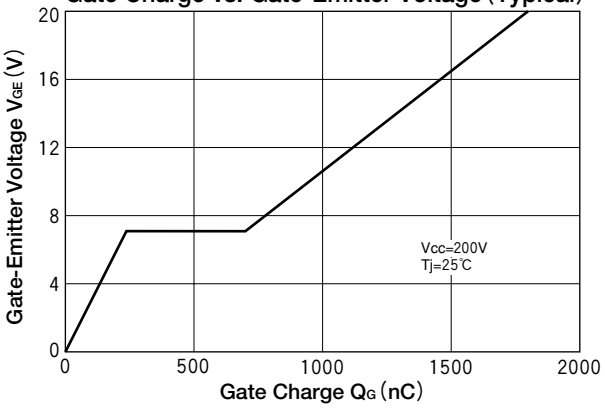
Forward Voltage of Free Wheeling Diode (Typical)



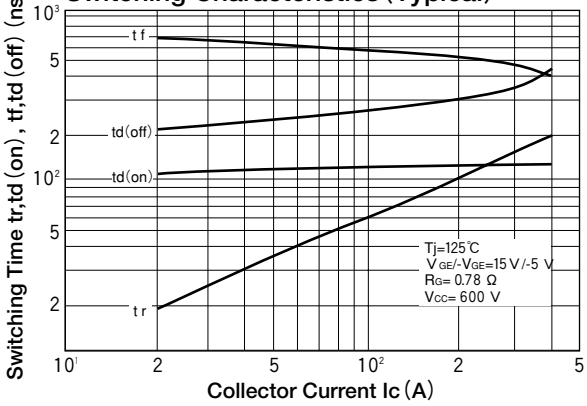
Input Capacitance, Output Capacitance, Reverse Transfer Capacitance (Typical)



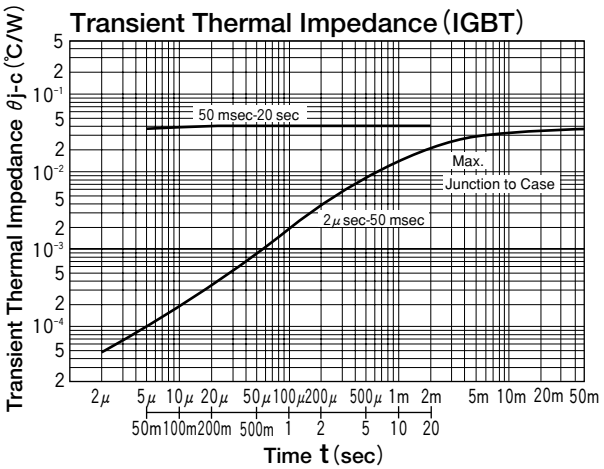
Gate Charge vs. Gate-Emitter Voltage (Typical)



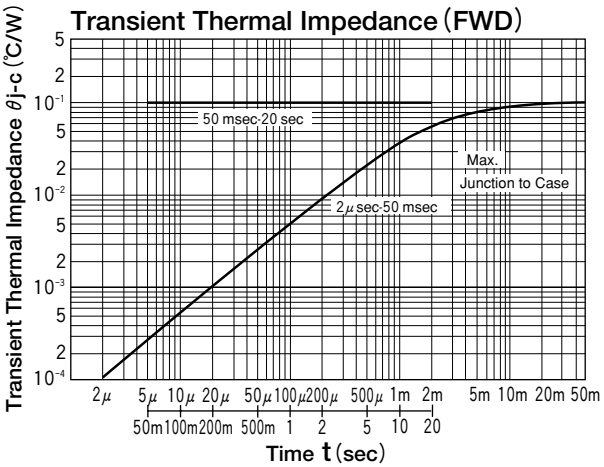
Switching Characteristics (Typical)



Transient Thermal Impedance (IGBT)



Transient Thermal Impedance (FWD)



Reverse Recovery Characteristics of Free-Wheel Diode (Typical)