

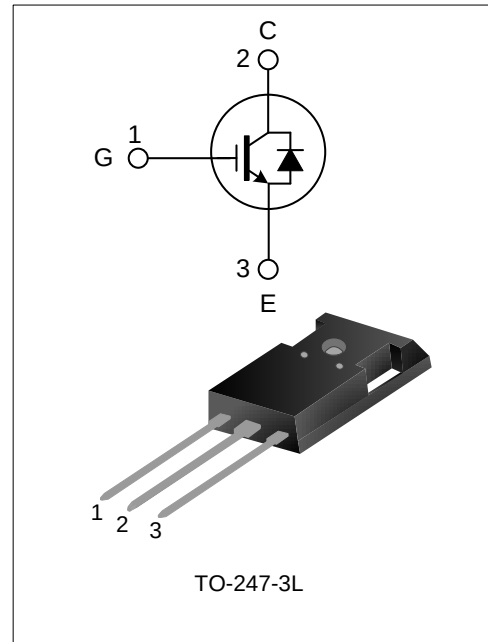
75A, 600V FIELD STOP IGBT

DESCRIPTION

SGT75T60SDM1P7 adopts Field Stop III IGBT technology, offer the optimum performance for induction Heating, UPS, SMPS and PFC application.

FEATURES

- 75A, 600V, $V_{CE(sat)}(typ.)=1.65V@I_C=75A$
- Low conduction loss
- Fast switching
- High input impedance



NOMENCLATURE

SGT 75 T 60 S D M 1 P7	
IGBT series	Package
Current, 70: 70A	P7 : TO-247-3L
N : N Channel	1,2,3... : Version No.
NE : N-channel planar gate with ESD	Blank: Standard diode
T : Field Stop 3/4	M : Standard Diode, full range
U : Field Stop 4+	R : Rapid Diode
V : Field Stop 5	B : Rapid Diode, full range
W : Field Stop 6	S : Soft Diode, full range
X : Field Stop 7	
Voltage, 65: 650V	D : Packaged with fast recovery diode
120: 1200V	R : RC IGBT
	L : Ultra low switching, recommended frequency ~2KHz
	Q : Low switching, recommended frequency 2~20K
	S : Standard frequency, recommended frequency 5~40K
	F : Fast switching, recommended frequency 10~60K
	UF : Ultra fast switching, recommended frequency 40K~

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SGT75T60SDM1P7	TO-247-3L	75T60SDM1	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^{\circ}\text{C}$ UNLESS OTHERWISE NOTED)

Characteristics		Symbol	Ratings	Units
Collector to Emitter Voltage		V_{CE}	600	V
Gate to Emitter Voltage		V_{GE}	± 20	V
Collector Current	$T_C=25^{\circ}\text{C}$	I_C	150	A
	$T_C=100^{\circ}\text{C}$		75	
Pulsed Collector Current		I_{CM}	225	A
Diode Current		I_F	75	A
Diode forward peak surge current		I_{FSM}	300	A
Maximum Power Dissipation ($T_C=25^{\circ}\text{C}$)		P_D	416	W
Operating Junction Temperature		T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	$-55 \sim +150$	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Units
Thermal Resistance, Junction to Case (IGBT)	$R_{\theta JC}$	0.3	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Case (FRD)	$R_{\theta JC}$	0.65	$^{\circ}\text{C/W}$

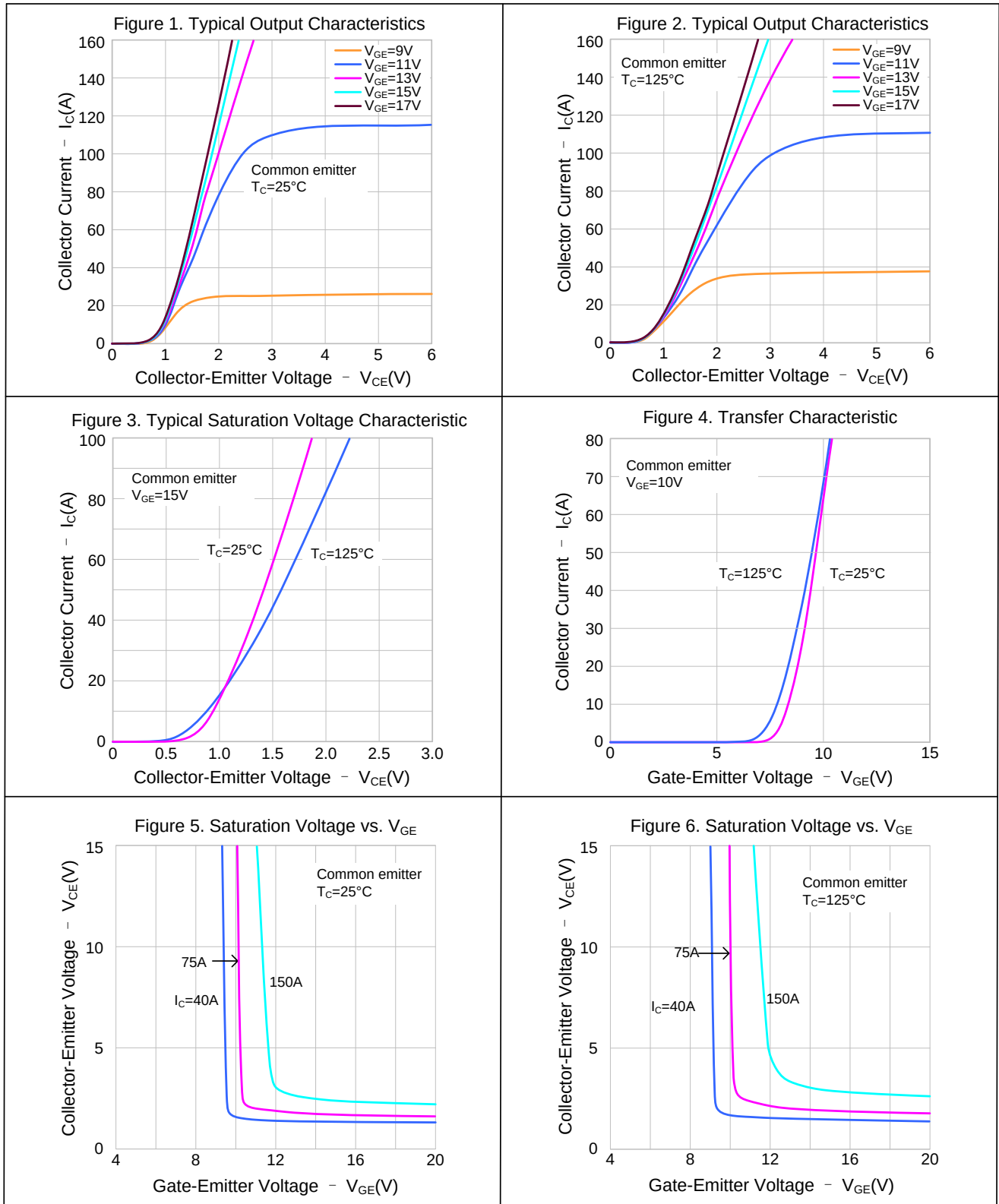
ELECTRICAL CHARACTERISTICS OF IGBT ($T_C = 25^\circ\text{C}$, UNLESS OTHERWISE NOTED)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE}=0V, I_C=250\mu A$	600	--	--	V
C-E Leakage Current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$	--	--	200	μA
G-E Leakage Current	I_{GES}	$V_{GE}=20V, V_{CE}=0V$	--	--	± 400	nA
G-E Threshold Voltage	$V_{GE(th)}$	$I_C=250\mu A, V_{CE}=V_{GE}$	4.0	5.0	7	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=75A, V_{GE}=15V, T_C=25^\circ\text{C}$	--	1.65		V
		$I_C=75A, V_{GE}=15V, T_C=125^\circ\text{C}$	--	1.90	--	V
Input Capacitance	C_{ies}	$V_{CE}=30V$	--	4200	--	pF
Output Capacitance	C_{oes}	$V_{GE}=0V$	--	300	--	
Reverse Transfer Capacitance	C_{res}	$f=1\text{MHz}$	--	83	--	
Turn-On Delay Time	$T_{d(on)}$	$V_{CE}=400V$ $I_C=75A$ $R_g=10\Omega$ $V_{GE}=15V$ Inductive load	--	55	--	ns
Rise Time	T_r		--	140	--	
Turn-Off Delay Time	$T_{d(off)}$		--	160	--	
Fall Time	T_f		--	120	--	
Turn-On Switching Loss	E_{on}	Inductive load	--	3.2	--	mJ
Turn-Off Switching Loss	E_{off}		--	1.2	--	
Total Switching Loss	E_{st}		--	4.4	--	
Total Gate Charge	Q_g	$V_{CE}=400V, I_C=75A, V_{GE}=15V$	--	180	--	nC
Gate to Emitter Charge	Q_{ge}		--	40	--	
Gate to Collector Charge	Q_{gc}		--	80	--	

ELECTRICAL CHARACTERISTICS OF FRD ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Units
Diode Forward Voltage	V_{FM}	$I_F=75A, T_C=25^\circ\text{C}$	--	1.2	--	V
		$I_F=75A, T_C=125^\circ\text{C}$	--	1.1	--	
Diode Reverse Recovery Time	T_{rr}	$I_{EC}=75A, dI_{EC}/dt=200A/\mu s$	--	190	--	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_{EC}=75A, dI_{EC}/dt=200A/\mu s$	--	1.65	--	nC

TYPICAL CHARACTERISTICS CURVE



TYPICAL CHARACTERISTICS CURVE (CONTINUED)

Figure 7. Saturation Voltage Drop vs. Temperature

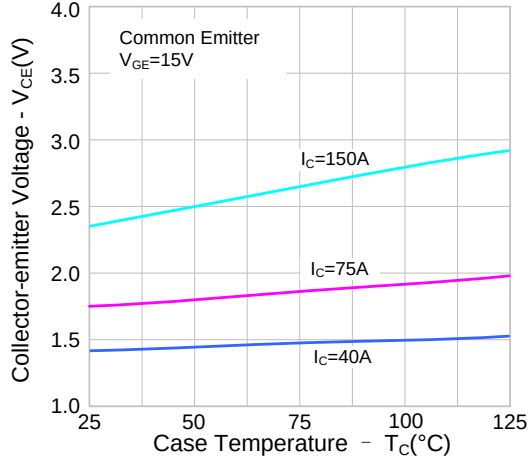


Figure 8. Capacitance Characteristic

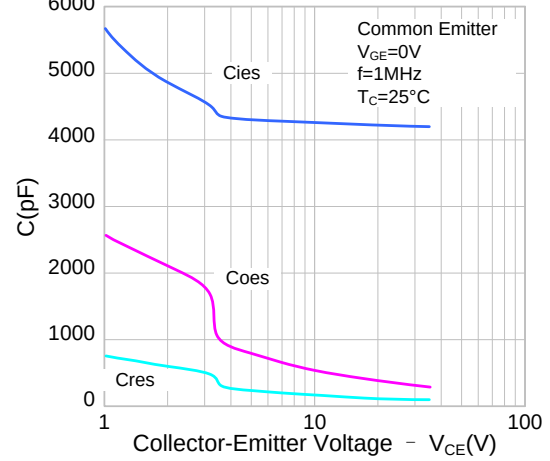


Figure 9. Gate Charge Characteristic

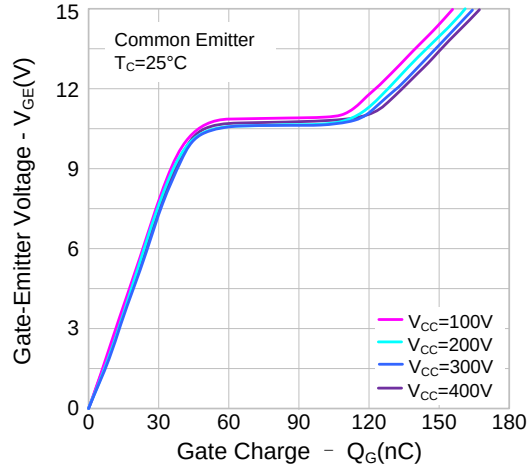


Figure 10. Turn-on Characteristic vs. Gate Resistance

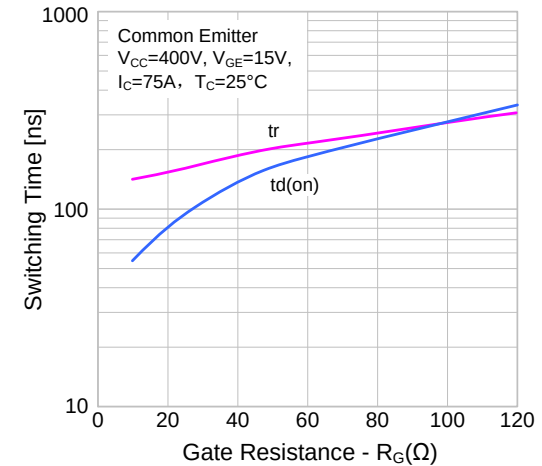


Figure 11. Turn-off Characteristic vs. Gate Resistance

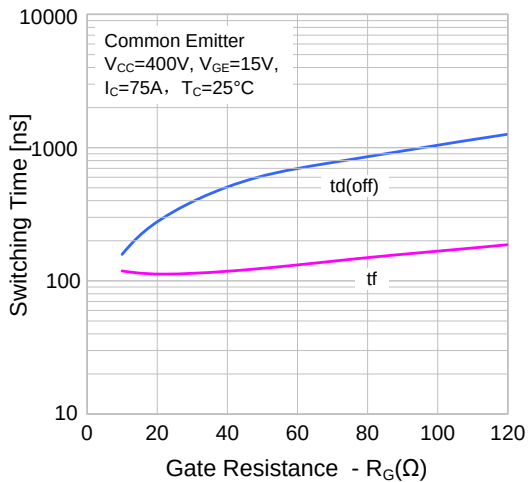
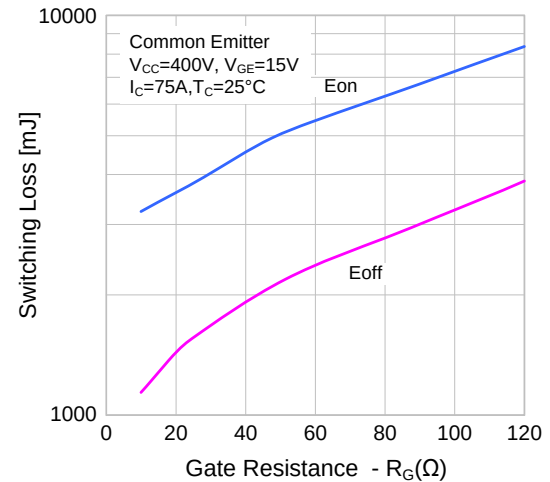


Figure 12. Switching Loss vs. Gate Resistance



TYPICAL CHARACTERISTICS CURVE (CONTINUED)

Figure 13. Turn-on Characteristic vs. Collector Current

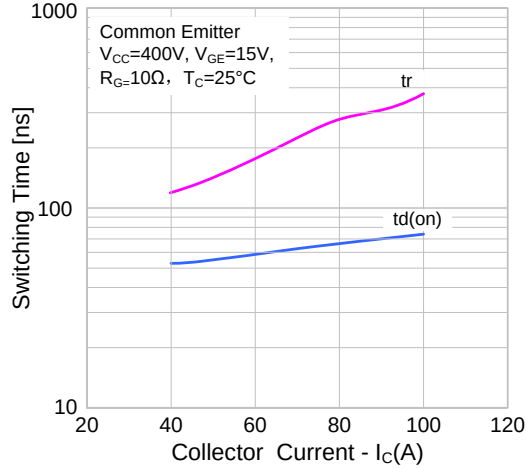


Figure 14. Turn-off Characteristic vs. Collector Current

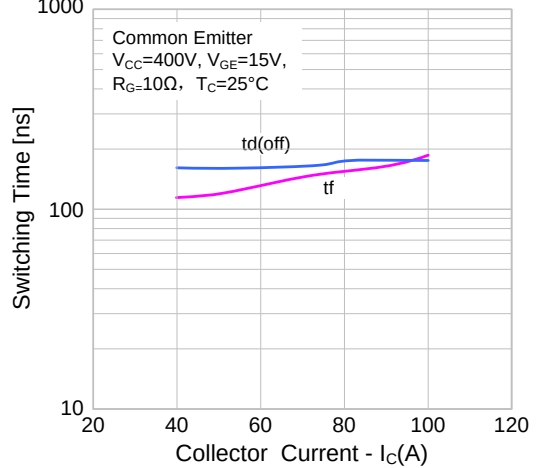


Figure 15. Switching Loss vs. Collector Current

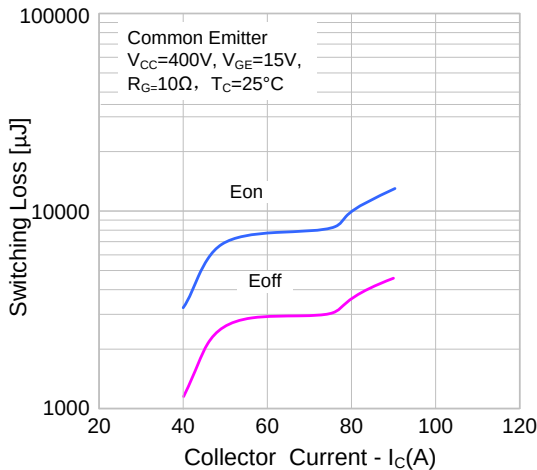


Figure 16. Forward Characteristic

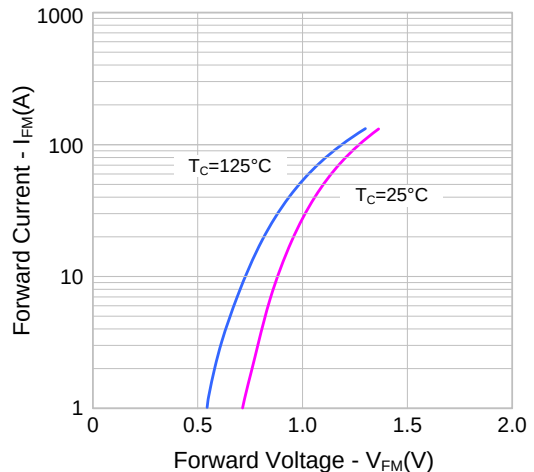


Figure 17. Reverse Recovery Time vs. Forward Current

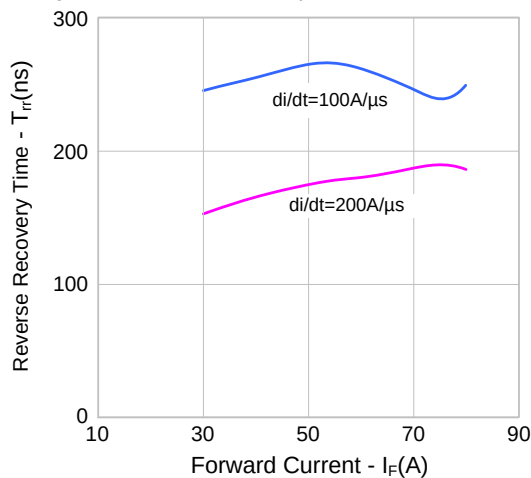
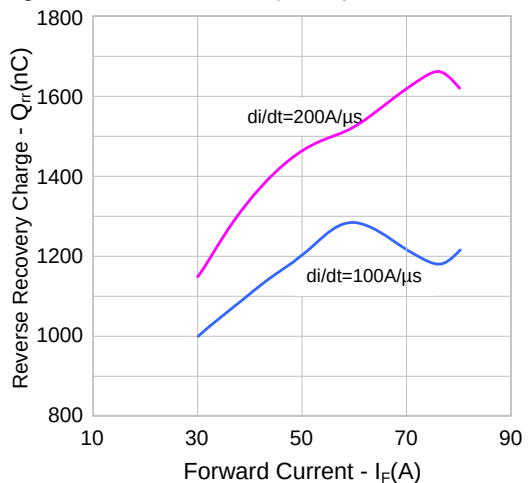
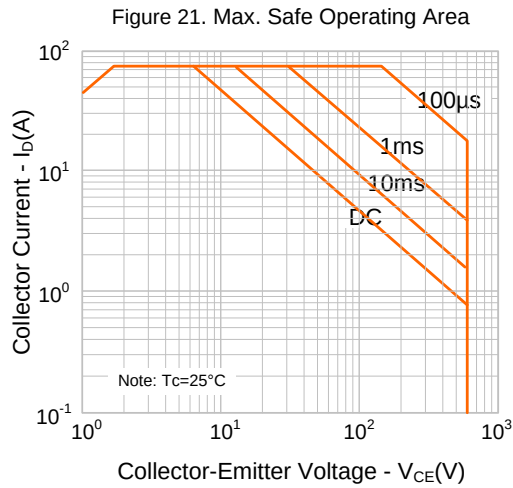
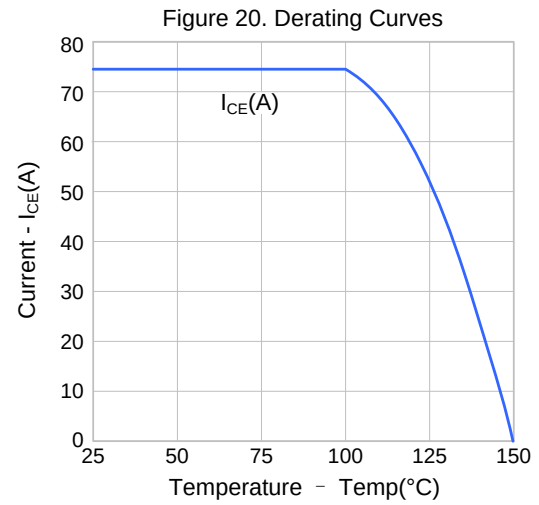
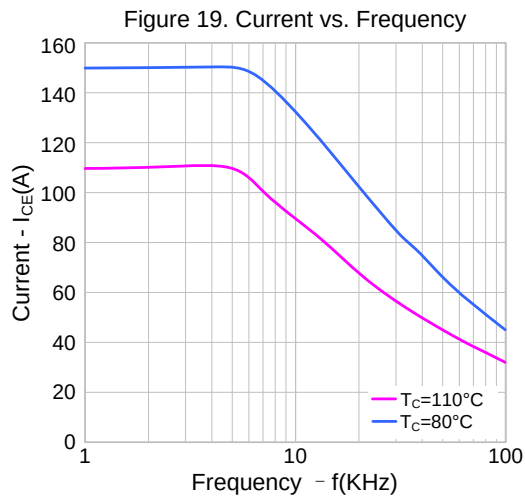


Figure 18. Reverse Recovery Charge vs. Forward Current



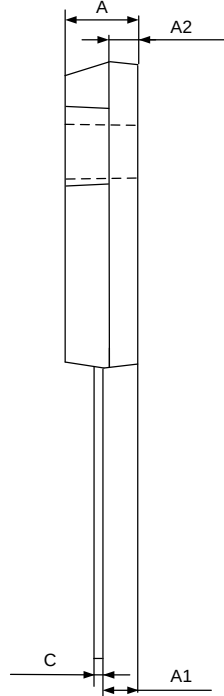
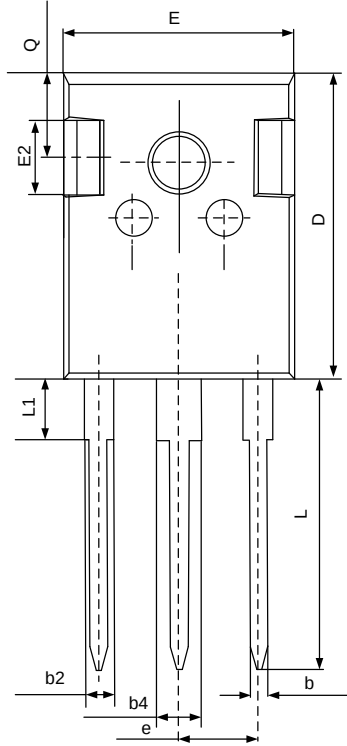
TYPICAL CHARACTERISTICS CURVE (CONTINUED)



PACKAGE OUTLINE

TO-247-3L

UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	—	1.36
b2	1.91	—	2.25
b4	2.91	—	3.25
c	0.51	—	0.75
D	20.80	21.00	21.30
E	15.50	15.80	16.10
E2	4.40	5.00	5.20
e	5.44 BSC		
L	19.72	19.92	20.22
L1	—	—	4.30
Q	5.60	5.80	6.00

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- The instructions are subject to change without notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.
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Rev.: 1.5

Revision History:

1. Modify Qge to 40nC
 2. Modify the template of datasheet
-

Rev.: 1.4

Revision History:

1. Update Gate to Emitter Charge for 10nC and Gate to Collector Charge for 80nC
-

Rev.: 1.3

Revision History:

1. Add Figure 19 and 20
-

Rev.: 1.2

Revision History:

1. Update NOMENCLATURE
-

Rev.: 1.1

Revision History:

1. Add I_{FSM}
-

Rev.: 1.0

Revision History:

1. First release
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