

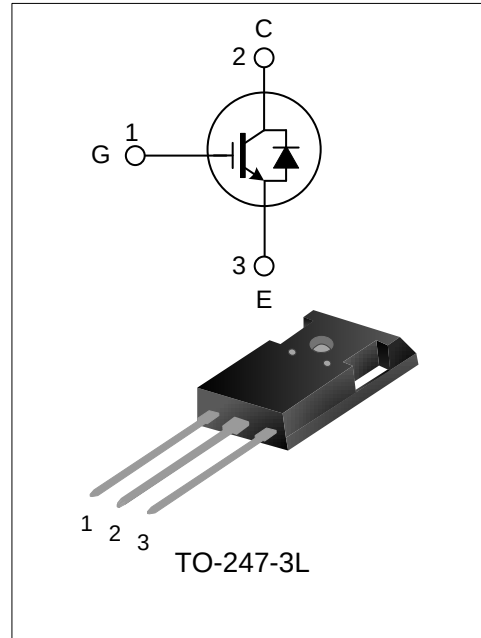
75A, 650V FIELD STOP IGBT

DESCRIPTION

SGT75T65SDM1P7 adopts Field Stop III IGBT technology, offer the optimum performance for induction Heating, UPS, SMPS and PFC application.

FEATURES

- 75A, 650V, $V_{CE(sat)}(typ.)=1.65V@I_C=75A$
- Low conduction loss
- Fast switching
- High input impedance



NOMENCLATURE

SGT 75 T 65 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
SGT75T65SDM1P7	TO-247-3L	75T65SDM1	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS (T_C=25°C UNLESS OTHERWISE NOTED)

Characteristics		Symbol	Ratings	Units
Collector to Emitter Voltage		V _{CE}	650	V
Gate to Emitter Voltage		V _{GE}	±20	V
Transient Gate to Emitter Voltage (t _p ≤10μs, D<0.010)		V _{GE}	±30	V
Collector Current	T _C =25°C	I _C	150	A
	T _C =100°C		75	
Pulsed Collector Current		I _{CM}	300	A
Diode Current		I _F	75	A
Diode forward peak surge current		I _{FSM}	300	A
Short-circuit time(V _{GE} =15V, V _{CC} =300V)		T _{SC}	10	μs
Maximum Power Dissipation (T _C =25°C)		P _D	416	W
Operating Junction Temperature		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Units
Thermal Resistance, Junction to Case (IGBT)	R _{θJC}	0.3	°C/W
Thermal Resistance, Junction to Case (FRD)	R _{θJC}	0.65	°C/W

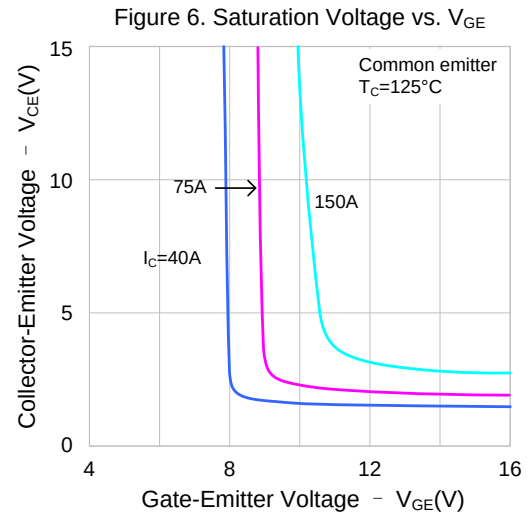
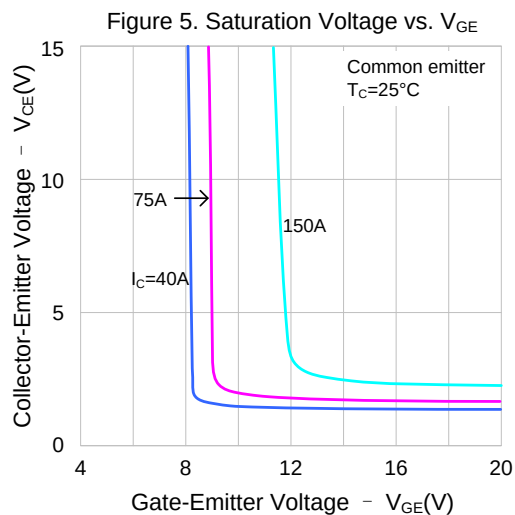
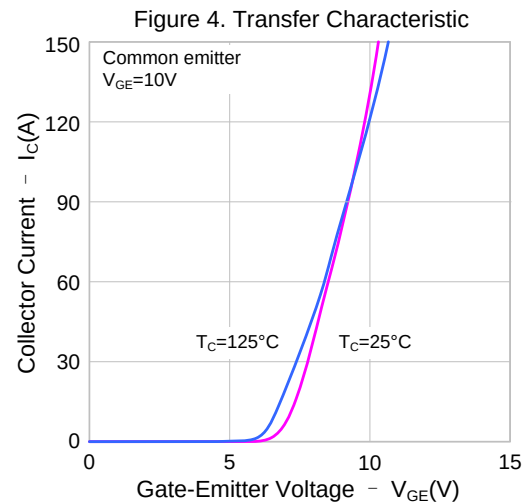
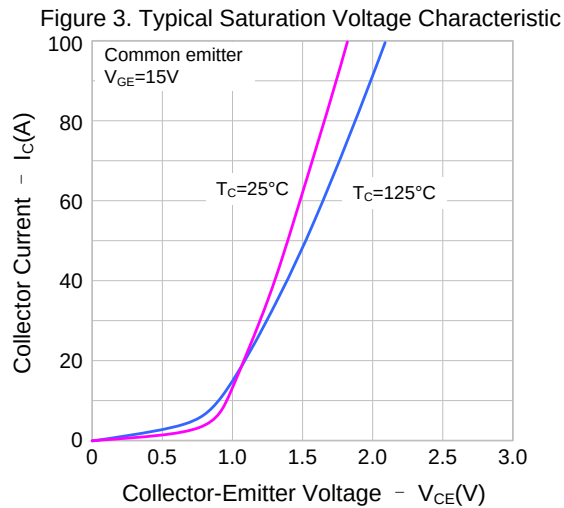
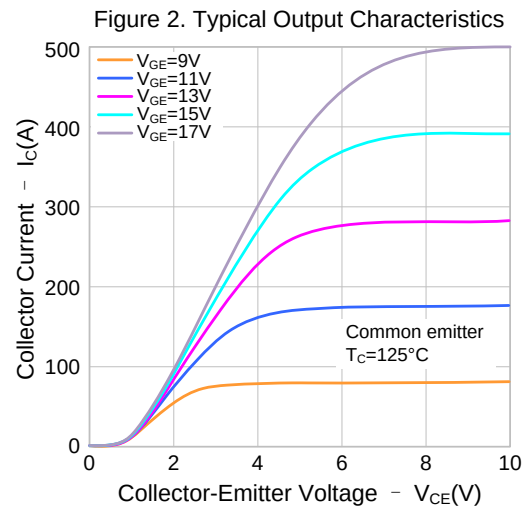
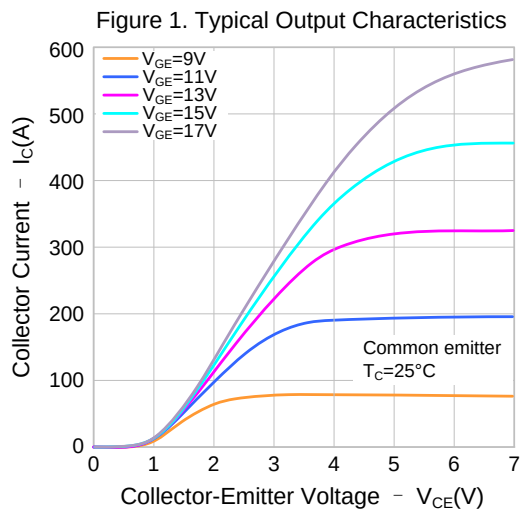
ELECTRICAL CHARACTERISTICS OF IGBT ($T_C=25^{\circ}\text{C}$, UNLESS OTHERWISE NOTED)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE}=0V, I_C=250\mu A$	650	--	--	V
C-E Leakage Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$	--	--	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	--	60	--	ns
Rise Time	T_r		--	180	--	
Turn-Off Delay Time	$T_{d(off)}$		--	220	--	
Fall Time	T_f		--	150	--	
Turn-On Switching Loss	E_{on}	Inductive load	--	5.0	--	mJ
Turn-Off Switching Loss	E_{off}		--	2.8	--	
Total Switching Loss	E_{st}		--	7.8	--	
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}	$I_F=75A, T_C=25^{\circ}\text{C}$	--	1.82	2.3	V
		$I_F=75A, T_C=125^{\circ}\text{C}$	--	1.52	--	
Diode Reverse Recovery Time	T_{rr}	$I_{EC}=75A, dI_{EC}/dt=200A/\mu s$	--	45	--	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_{EC}=75A, dI_{EC}/dt=200A/\mu s$	--	135	--	nC

TYPICAL CHARACTERISTICS CURVE



TYPICAL CHARACTERISTICS CURVE (CONTINUED)

Figure 7. Saturation Voltage Drop vs. Temperature

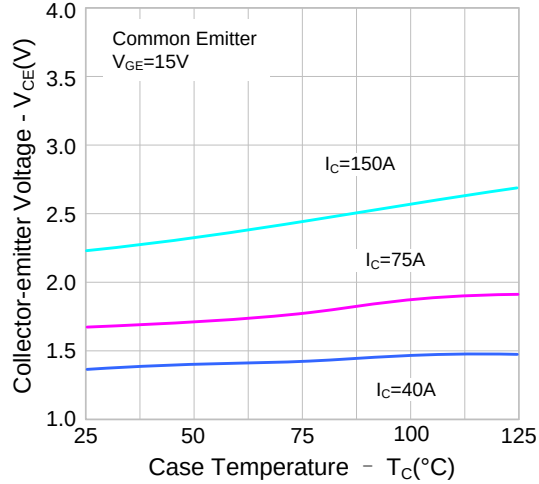


Figure 8. Capacitance Characteristic

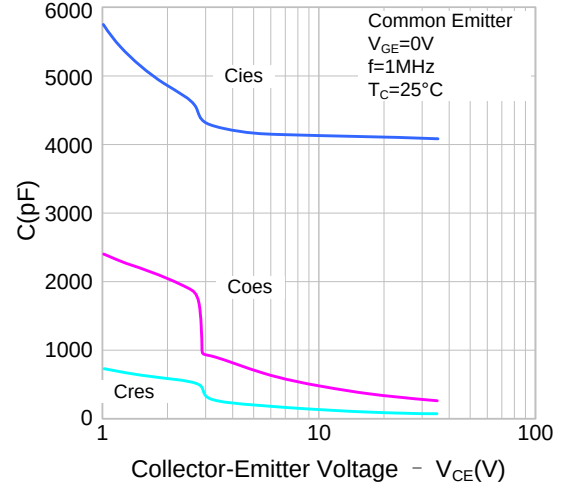


Figure 9. Gate Charge Characteristic

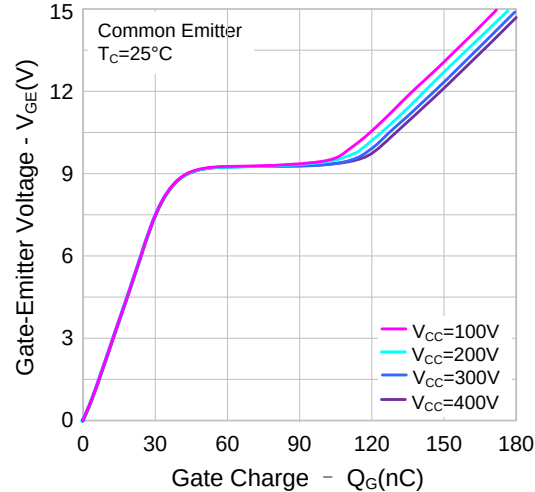


Figure 10. Turn-on Characteristic vs. Gate Resistance

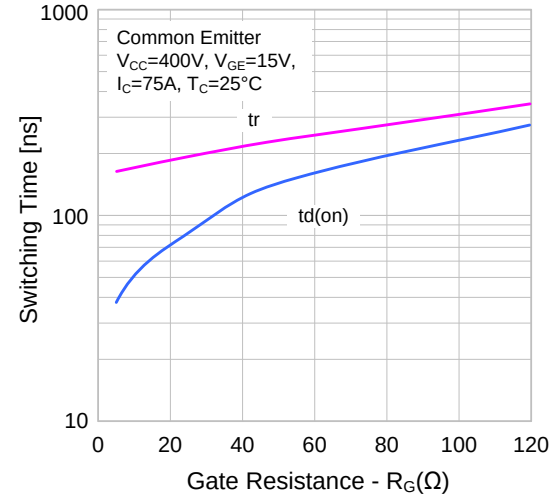


Figure 11. Turn-off Characteristic vs. Gate Resistance

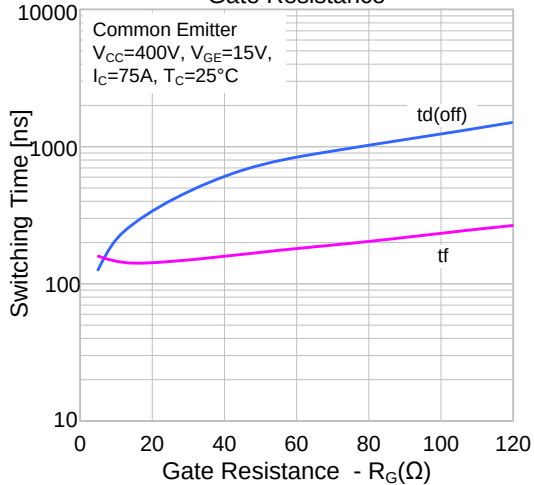
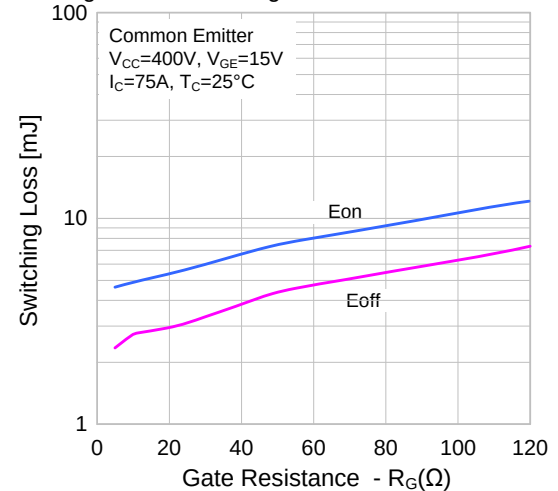


Figure 12. Switching Loss vs. Gate Resistance



TYPICAL CHARACTERISTICS CURVE (CONTINUED)

Figure 13. Turn-on Characteristic vs. Collector Current

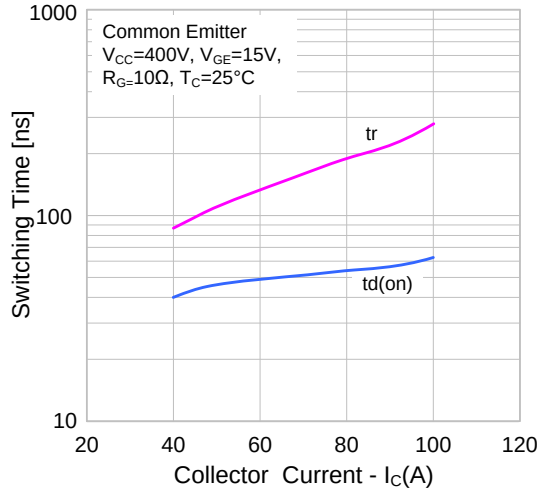


Figure 14. Turn-off Characteristic vs. Collector Current

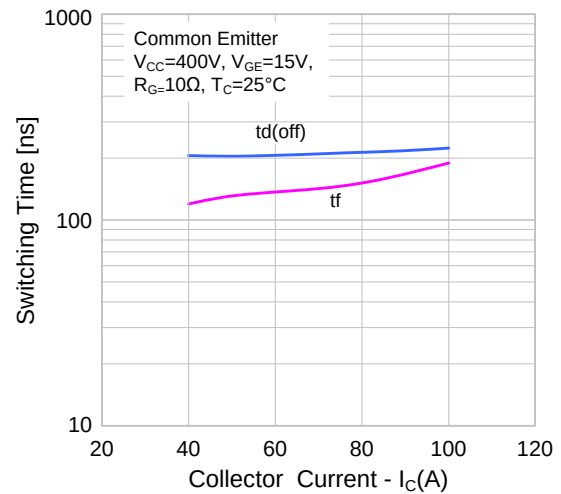


Figure 15. Switching Loss vs. Collector Current

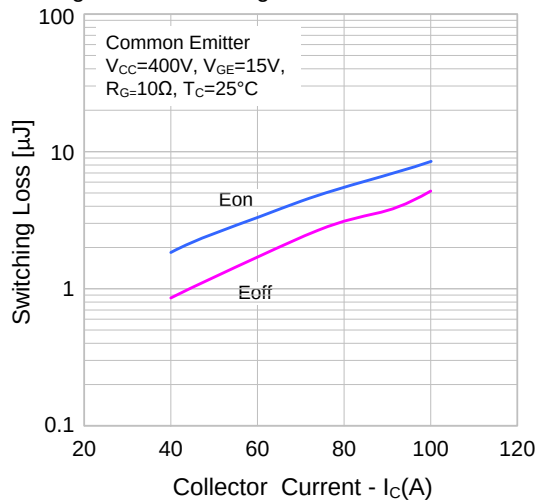


Figure 16. Forward Characteristic

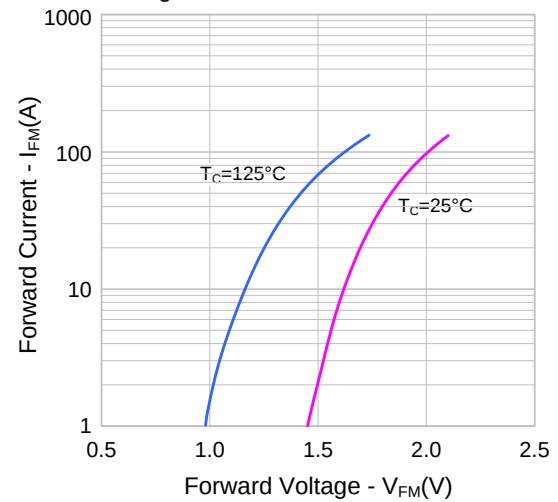


Figure 17. Reverse Recovery Time vs. Forward Current

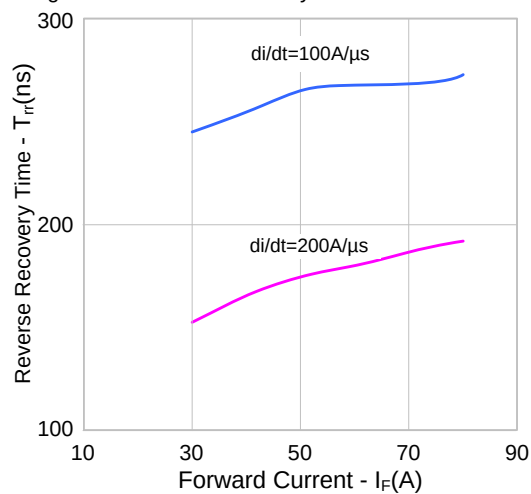
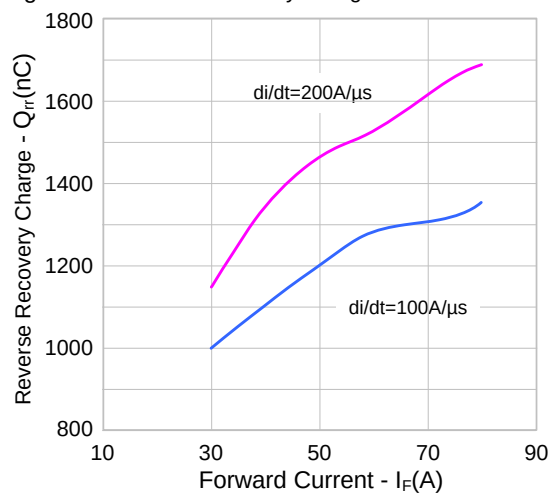
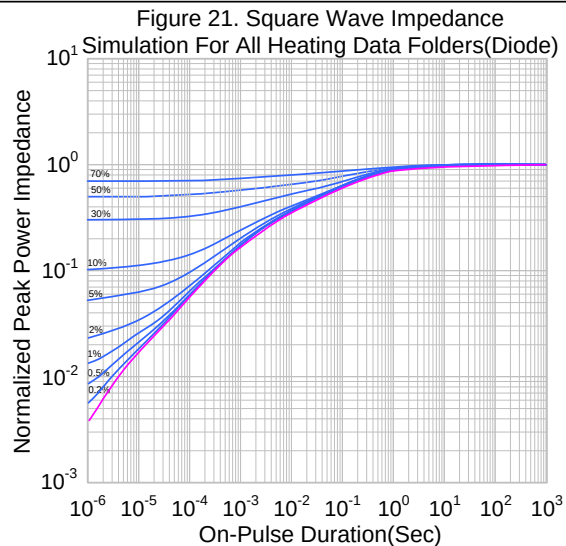
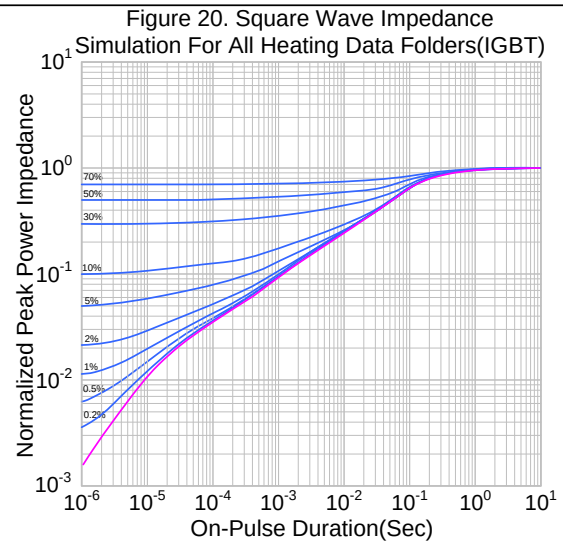
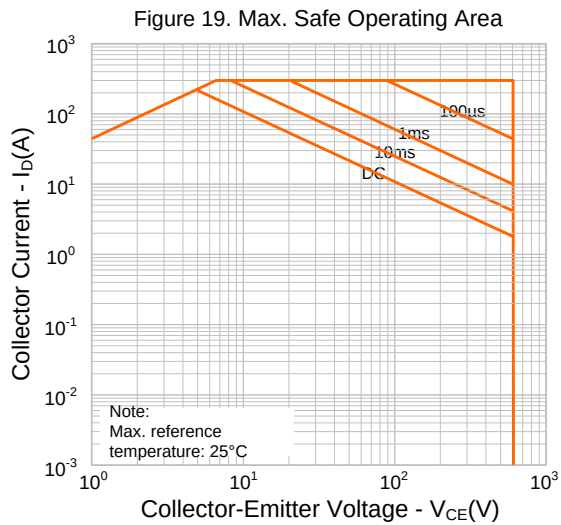


Figure 18. Reverse Recovery Charge vs. Forward Current



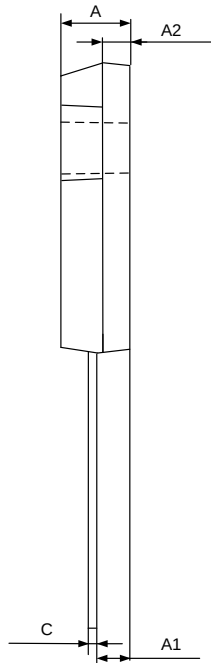
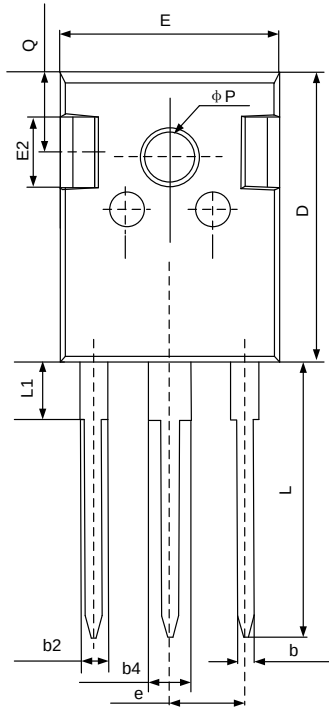
TYPICAL CHARACTERISTICS CURVE (CONTINUED)



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
P	3.40	—	3.80

Important notice :

1. The instructions are subject to change without notice !
2. Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current. Please read the instructions carefully before using our products, including the circuit operation precautions.
3. Our products are consumer electronic products or the other civil electronic products.
4. When using our products, please do not exceed the maximum rating of the products, otherwise the reliability of the whole machine will be affected. There is a certain possibility of failure or malfunction of any semiconductor product under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design, sample and whole machine manufacturing, so as to avoid potential failure risk that may cause personal injury or property loss.
5. It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
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Rev.: 1.5

Revision History:

1. Increase the value of V_{GE}
-

Rev.: 1.4

Revision History:

2. Add short circuit protection time
 3. Update the template of the datasheet
-

Rev.: 1.3

Revision History:

1. Update the typical and maximum values of V_F at room temperature 75A according to big data
 2. Update the typical V_F value at 125° 75A
 3. Update T_{rr} and Q_{rr}
 4. Modify the forward feature in Figure 16
 5. Change the template
-

Rev.: 1.2

Revision History:

1. Update ELECTRICAL CHARACTERISTICS OF IGBT
 2. Update all curves
-

Rev.: 1.1

Revision History:

1. Update the value of I_{CM}
 2. Update SOA
 3. Update the package outline
-

Rev.: 1.0

Revision History:

1. First release
-