

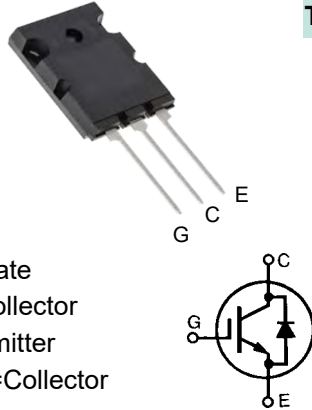
SG60T121UDB3

Discrete IGBTs

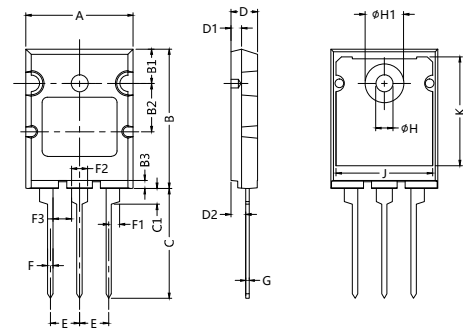
$V_{CES} = 1200V$
 $I_{C90} = 60A$
 $V_{CEsat(typ)} = 2.10V$
 $E_{off(typ)} = 2.4mJ$



G=Gate
C=Collector
E=Emitter
TAB=Collector



TO-264



IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES} V_{CGR}	$T_J=25^{\circ}C$ to $150^{\circ}C$ $T_J=25^{\circ}C$ to $150^{\circ}C$; $R_{GE}=1\ \Omega$;	1200 1200	V
V_{GES} V_{GEM}	Continuous Transient	± 20 ± 30	V
I_{C25} I_{C90} I_{CM}	$T_C=25^{\circ}C$; limited by leads $T_C=90^{\circ}C$ $T_C=25^{\circ}C$, 1 ms	100 60 200	A
tsc	Short circuit withstand time $V_{GE} = 15V$, $V_{CC} \leq 1200V$, $T_J \leq 150^{\circ}C$	10	μs
Pc	$T_C=25^{\circ}C$	350	W
T_J T_{JM} T_{stg}		-55...+175 175 -55...+150	$^{\circ}C$
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s Maximum Tab temperature for soldering SMD devices for 10s	300 260	$^{\circ}C$ $^{\circ}C$
M_d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight	TO-264	8	g

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

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
BV_{CES}	$I_C=1mA$; $V_{GE}=0V$	1200			V
$V_{GE(th)}$	$I_C=250\mu A$; $V_{CE}=V_{GE}$	4.5	5.8	7.0	V
I_{CES}	$V_{CE}=V_{CES}$; $T_J=25^{\circ}C$ $V_{GE}=0V$; $T_J=125^{\circ}C$			260 4	μA mA
I_{GES}	$V_{CE}=0V$; $V_{GE}=\pm 20V$			± 250	nA
$V_{CE(sat)}$	$I_C=I_{C90}$; $V_{GE}=15V$		2.10	2.40	V

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(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =I _{C90} ; V _{CE} =10V Pulse test, t _s ≤300us, duty cycle≤2%		33		S
I _{C(ON)}	V _{GE} =10V; V _{CE} =10V		175		A
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		4800 270 140		pF
Q _g Q _{ge} Q _{gc}	I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES}		250 32 157		nC
t _{d(on)} t _{ri} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =25°C I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =5 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		60 56 265 33 2.4		ns ns ns ns mJ
t _{d(on)} t _{ri} E _{on} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =150°C I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =5 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		55 54 3.5 300 38 2.85		ns ns mJ ns ns mJ
R _{thJC} (IGBT)	TO-264			0.35	°C/W
R _{thJA} (IGBT)				40	°C/W

Reverse Diode (FRED)

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V _F	I _F =60A; T _{VJ} =125°C T _{VJ} =25°C		1.7 2.0	2.2 2.4	V
I _{RM}	V _R =100V; I _F =60A; -di _F /dt=100A/us L≤0.05uH; T _{VJ} =100°C		5.4		A
t _{rr}	I _F =1A; -di _F /dt=50A/us; V _R =30V; T _J =25°C		45		ns
R _{thJC}	TO-264		0.28		K/W

Sirectifier®

SG60T121UDB3

Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Short circuit withstand time – 10 μ s
- Switching frequency up to 30KHz
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes

Application

- AC and DC motor control
- AC servo and robot drives
- Power supplies
- Welding inverters
- Solar inverters
- Chargers

Advantages

- Space and weight savings
- Reduced protection circuits

Standard applicable to Power Semiconductors

- IEC191-1/4
- IEC747-1
- IEC747-6
- IEC68-2-...
- UL94-V0

Product Reliability

- IEC147-4
- IEC68-2-14
- IEC68-2-20
- IEC68-2-27
- CECC50000-4.4.3

Package: TO-264

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

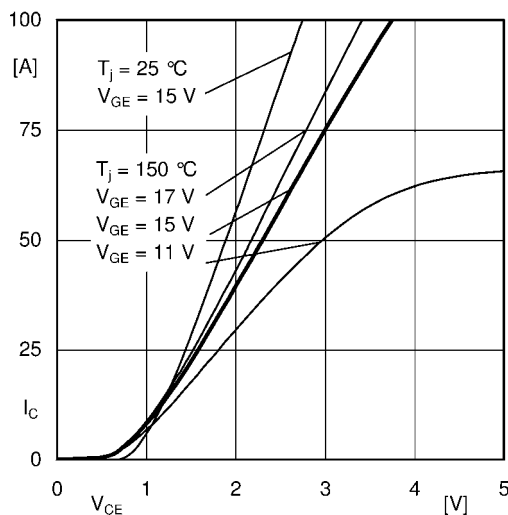


Fig. 1: Typ. output characteristic, inclusive $R_{CC} + EE'$

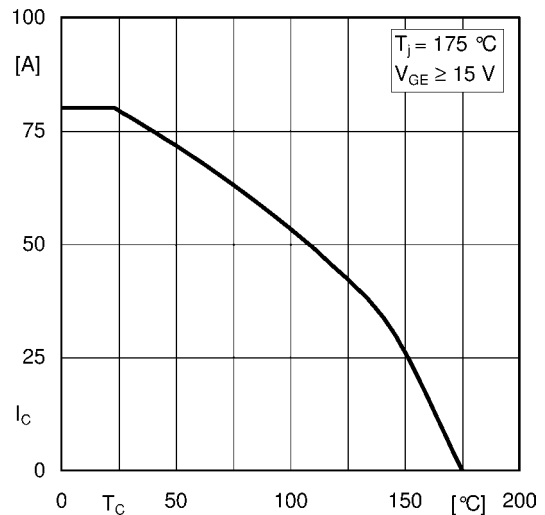


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

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Discrete IGBTs

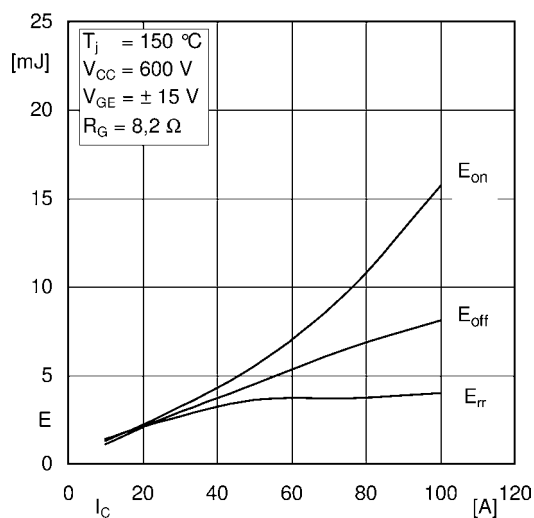


Fig. 3: Typ. turn-on /-off energy = f(I_C)

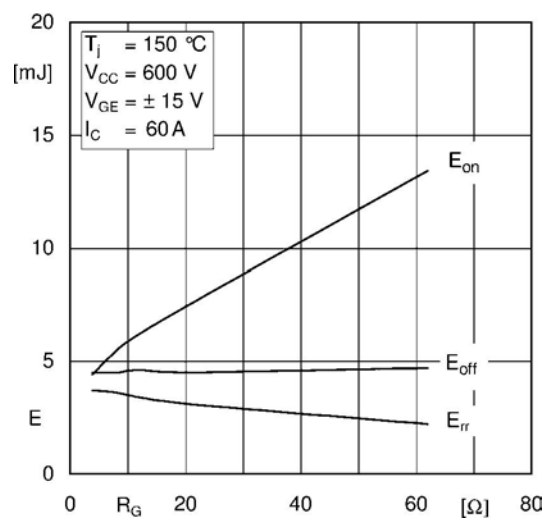


Fig. 4: Typ. turn-on /-off energy = f(R_G)

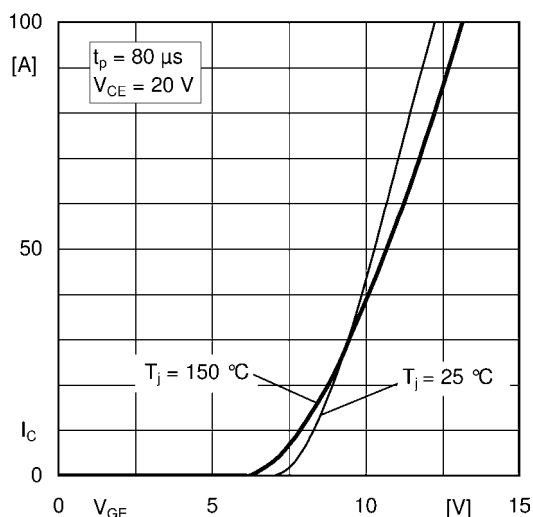


Fig. 5: Typ. transfer characteristic

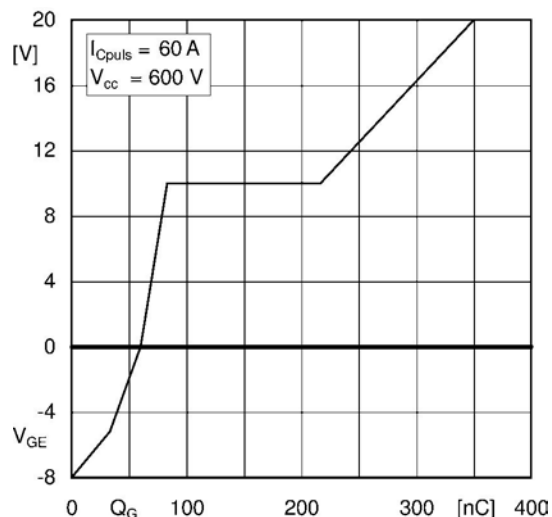


Fig. 6: Typ. gate charge characteristic

SG60T121UDB3

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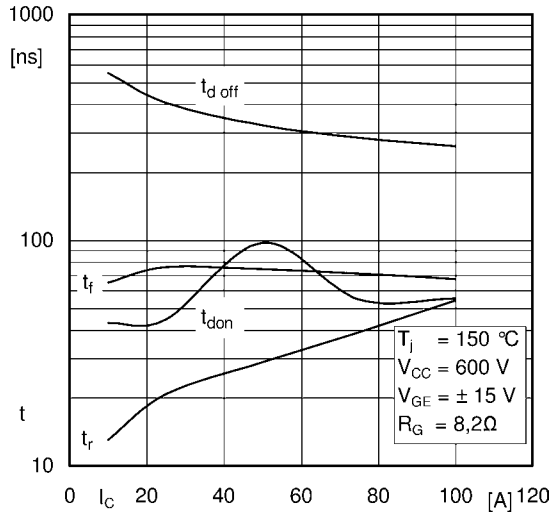


Fig. 7: Typ. switching times vs. I_C

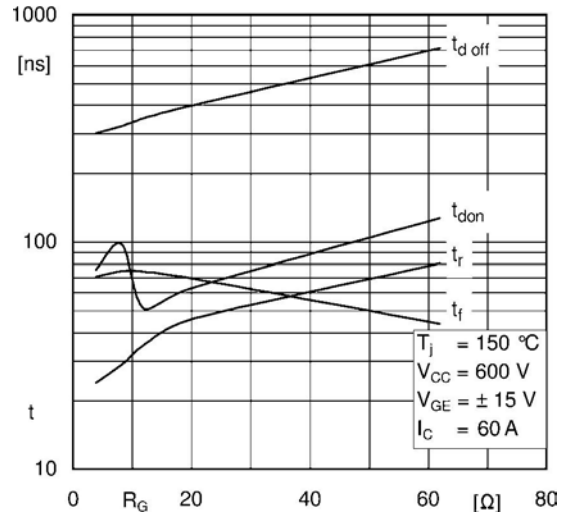


Fig. 8: Typ. switching times vs. gate resistor R_G

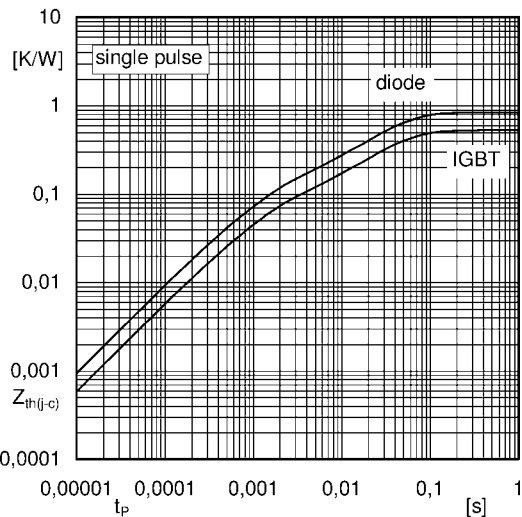


Fig. 9: Transient thermal impedance

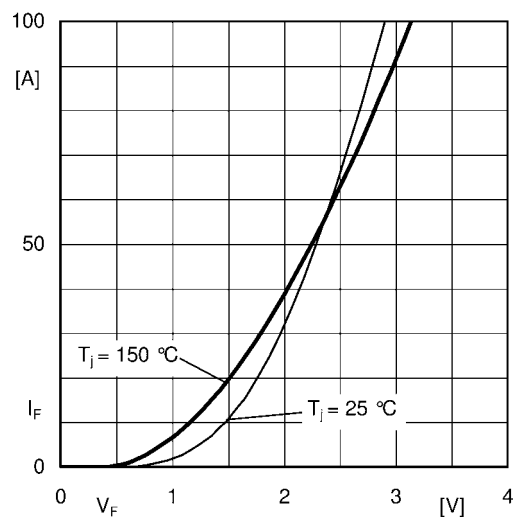


Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'} + E E'$

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Discrete IGBTs

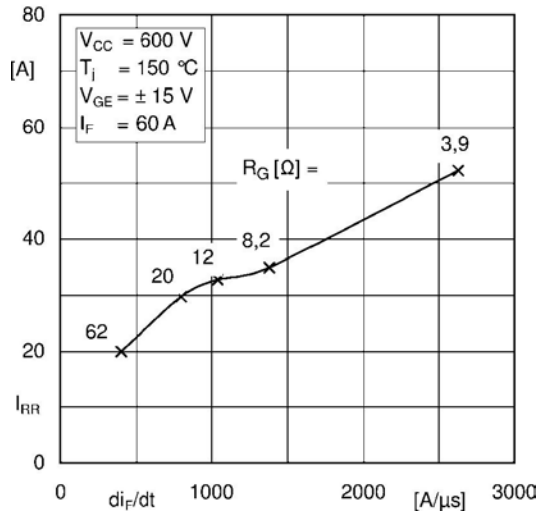


Fig. 11: FRD diode peak reverse recovery current

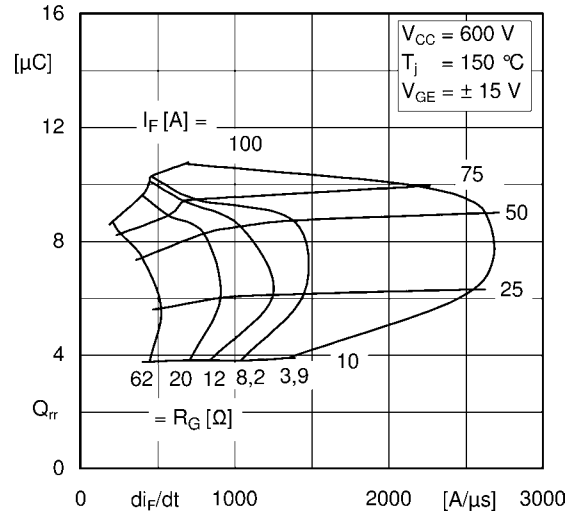
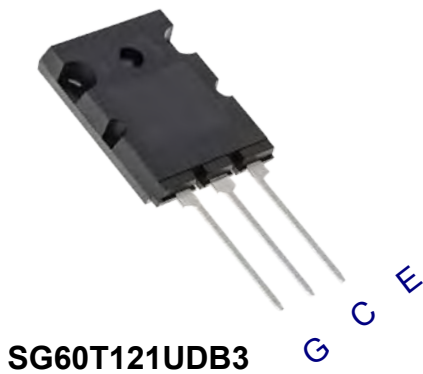
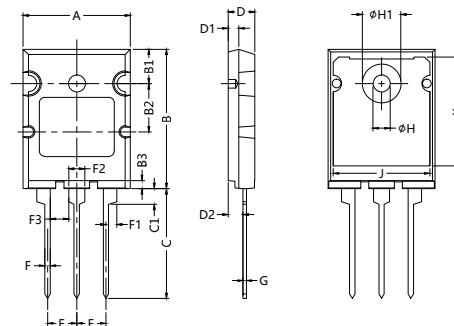


Fig. 12: Typ. FRD diode peak reverse recovery charge

TO-264



SG60T121UDB3



Dim.	Millimeter		Dim.	Millimeter	
	Min.	Max.		Min.	Max.
A	19.50	20.50	E	5.45TYP	
B	25.70	26.30	F	0.90	1.25
B1	5.80	6.20	F1	2.30	2.75
B2	8.80	9.20	F2	2.80	3.20
B3	1.35REF		F3	2.40	/
C	19.50	20.50	G	0.50	0.85
C1	2.20	2.70	H	3.20	3.60
D	4.80	5.20	H1	6.50	7.50
D1	2.00REF		J	16.00	/
D2	2.50	3.10	K	19.00	/