

SG60T120UDB3

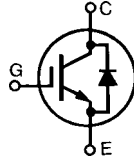
Discrete IGBTs

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

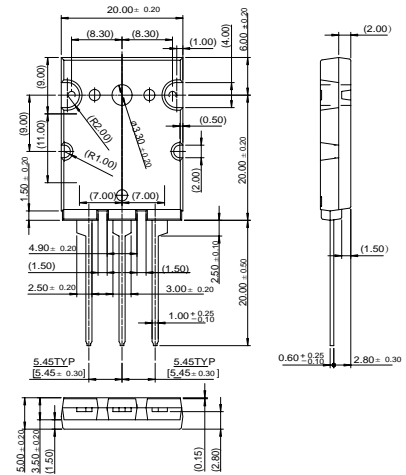


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G=Gate
 C=Collector
 E=Emitter
 TAB=Collector



TO-264



IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES}	$T_J=25^{\circ}C$ to $150^{\circ}C$	1200	V
V_{CGR}	$T_J=25^{\circ}C$ to $150^{\circ}C$; $R_{GE}=1 M\Omega$;	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C=25^{\circ}C$; limited by leads	100	A
I_{C90}	$T_C=90^{\circ}C$	60	A
I_{CM}	$T_C=25^{\circ}C$, 1 ms	200	A
SSOA (RBSOA)	$V_{GE}=15V$; $T_{VJ}=125^{\circ}C$; $R_G=5 \Omega$ Clamped inductive load	$I_{CM}=150$ @ 0.8 V_{CES}	A
P_c	$T_C=25^{\circ}C$	350	W
T_J		-55...+175	$^{\circ}C$
T_{JM}		175	$^{\circ}C$
T_{stg}		-55...+150	$^{\circ}C$
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s	300	$^{\circ}C$
	Maximum Tab temperature for soldering SMD devices for 10s	260	$^{\circ}C$
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}	$V_{CE}=V_{CES}$; $T_J=25^{\circ}C$			260	μA
	$V_{GE}=0V$; $T_J=125^{\circ}C$			4	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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Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =I _{C90} ; V _{CE} =10V Pulse test, t _{on} ≤300us, duty cycle≤2%		33		S
I _{C(ON)}	V _{GE} =10V; V _{CE} =10V		11		A
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		18 7 1		pF
Q _g Q _{ge} Q _{gc}	I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES}		21 3 11		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} =5Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		6 5 26 3 6		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} =5Ω 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



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Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 30KHz
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- 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

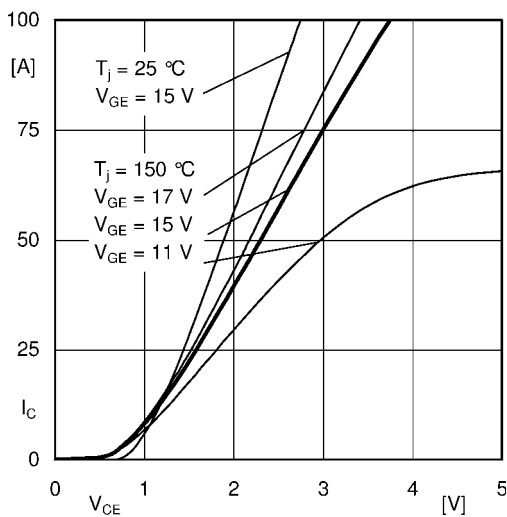


Fig. 1: Typ. output characteristic, inclusive R_{CC+EE}

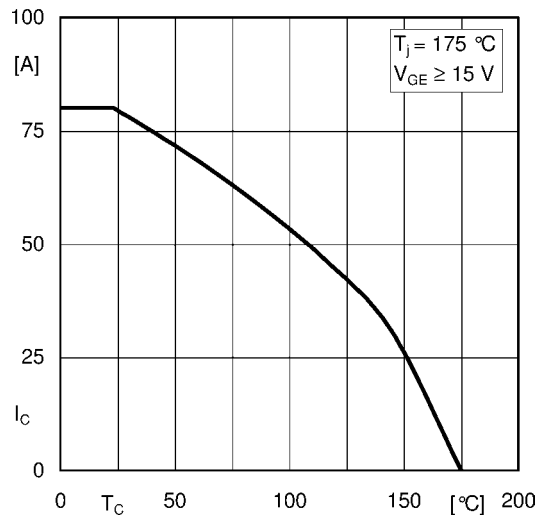


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

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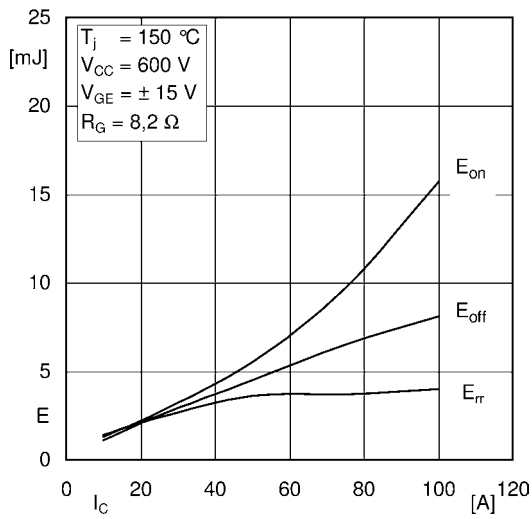


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

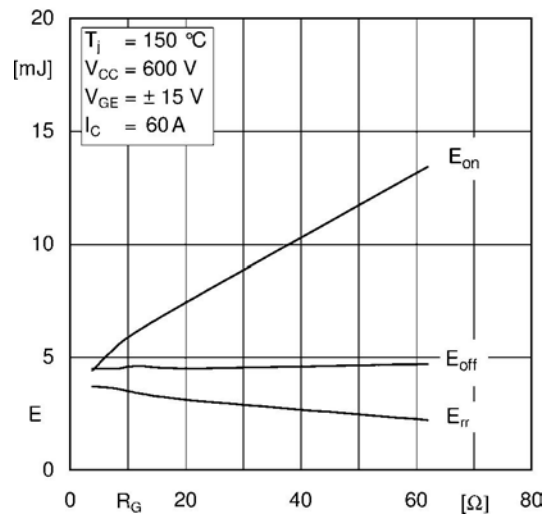


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

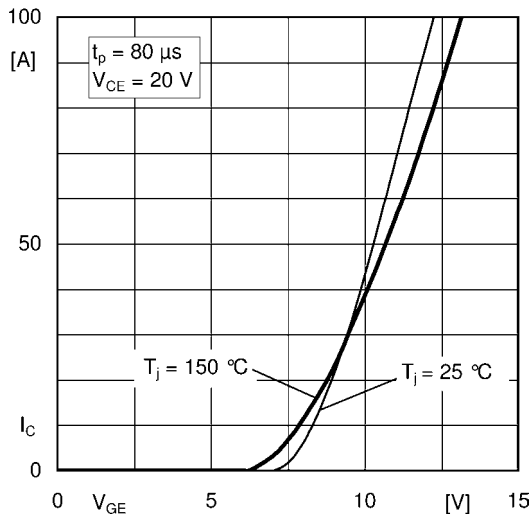


Fig. 5: Typ. transfer characteristic

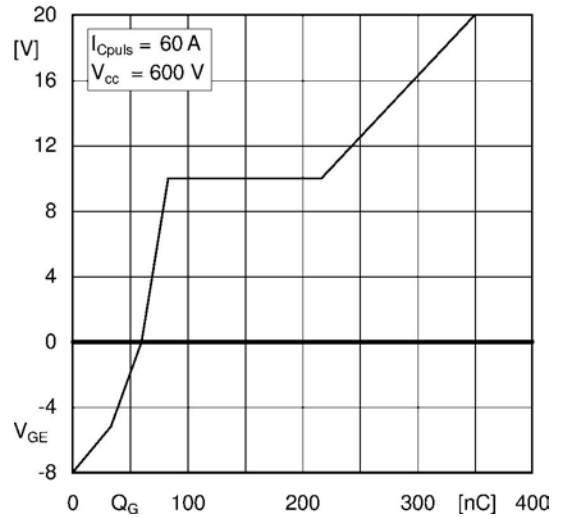


Fig. 6: Typ. gate charge characteristic



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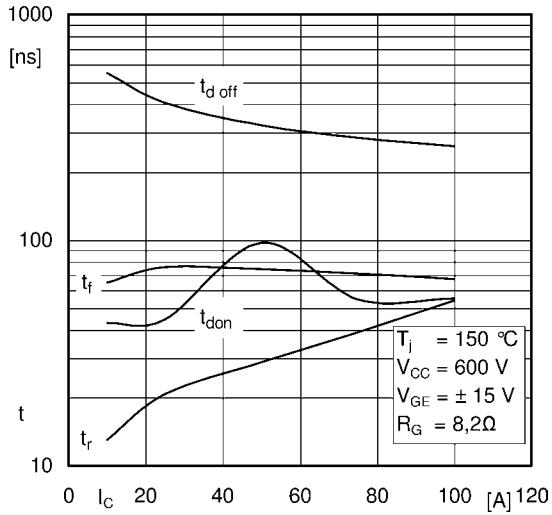


Fig. 7: Typ. switching times vs. I_C

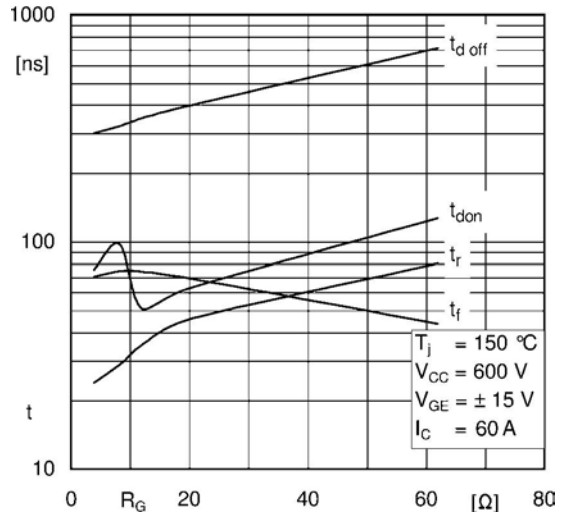


Fig. 8: Typ. switching times vs. gate resistor R_G

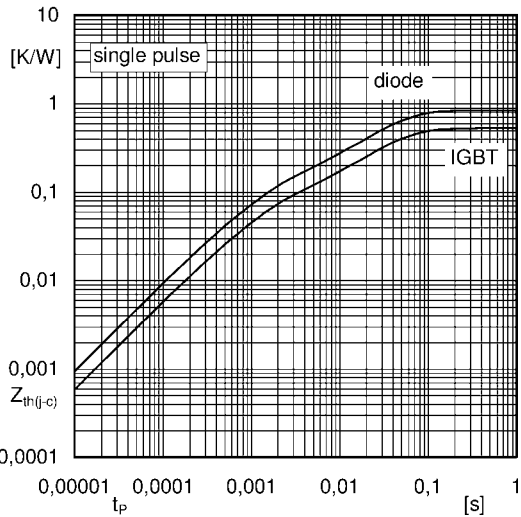


Fig. 9: Transient thermal impedance

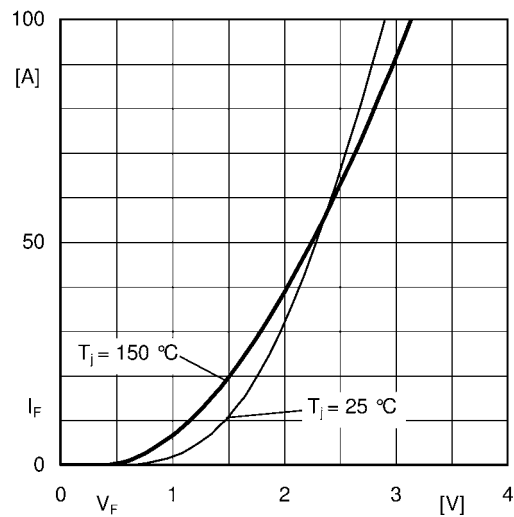


Fig. 10: Typ. FRD diode forward charact., incl. R_{CC+EE}



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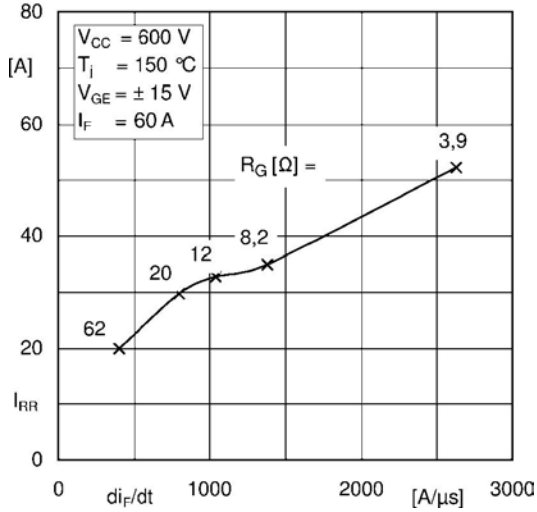


Fig. 11: FRD diode peak reverse recovery current

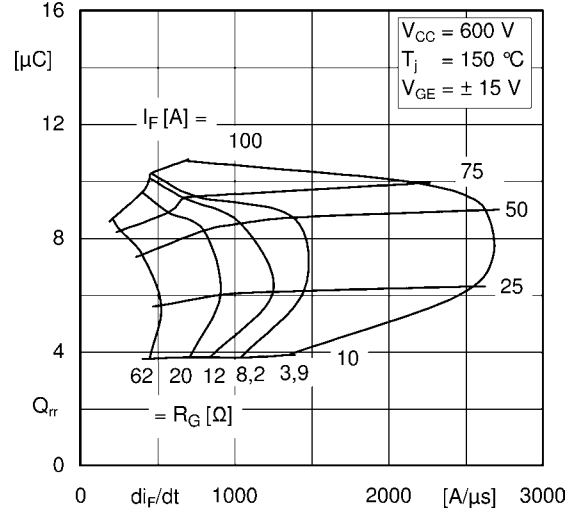


Fig. 12: Typ. FRD diode peak reverse recovery charge

