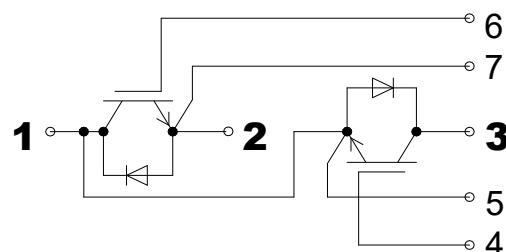


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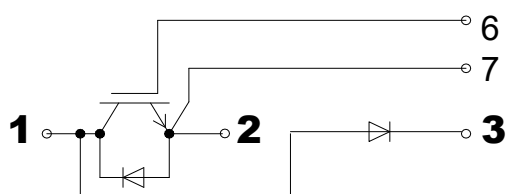
IGBT Modules For Welding Application



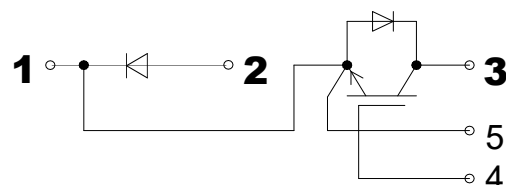
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SGD75NF120SC1



SDG75NF120SC1



Symbol	Test Condition	Value	Unit
IGBT			
V_{CES}		1200	V
I_C	$T_C = 100^{\circ}\text{C}$ per chip	75	A
V_{GES}		± 20	V
$T_{vj} (T_{stg})$		$-40 \sim +150(125)$	$^{\circ}\text{C}$
P_{tot}		300	W
INVERSE DIODE			
I_F	$T_C = 25^{\circ}\text{C}$ per chip	35	A
I_{FSM}		350	A
V_{RRM}		1200	V
I^2t	$T_j = 125^{\circ}\text{C}$, $t = 10\text{ms}$, $V_R = 0\text{V}$	350	A^2s

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IGBT Modules For Welding Application

Symbol	Test Conditions	Min	Typ	Max	Unit
IGBT Tc = 25°C unless otherwise specified					
V _{GE(th)}	VGE=VCE, IC = 1mA	4.5	5.0	5.7	V
I _{CES}	VGE = 0; VCE=VCES; Tj=25(125)°C			1	mA
V _{CE(TO)}	Tj=25(125)°C		1.0(0.9)	1.15(1.05)	V
r _{CE}	VGE=15V		18(25)	24(29)	mΩ
V _{CE(sat)}	IC=75A; VGE=15V; chip level		1.9	2.3	V
C _{ies}	VGE=0V, VCE=25V, f=1MHz		6.3		nF
C _{oes}			0.86		
C _{res}			0.55		
LCE				30	nH
RCC'+EE'	Termial to Case, Tc=25°C		0.75		mΩ
t _{d(on)}	Vcc = 600V, IC = 75A RGON = RGOFF = 10Ω Tj=125°C VGE=±15V		24		ns
t _r			46		ns
t _{d(off)}			276		ns
t _f			87		ns
E _{on} /E _{off}			4.30/2.10		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
VF	IF =35A; VGE=0V; Tj = 25°C		1.9	2.2	V
Qrr	IF=35A; VR=300V; Tj=25°C di/dt = 600A/us, VGE=-15V		6.5		μC
IRRM			35		A
Erec			2.00		mJ
THERMAL CHARACTERISTICS					
Rth(j-c)	per IGBT			0.38	K/W
Rth(j-c)D	per FRD			1.60	K/W
Mechanical Data					
Ms		2.5		4	Nm
Weight			158		g

Features

- Planar Gate Field Stop Technology IGBT
- Fast Recovery Free Wheeling Diode
- Low Switching Losses
- $V_{ce(sat)}$ with positive temperature coefficient
- Fast Switching and short tail current
- Switched mode power supplies at $f_{sw}>20KHz$
- Resonant inverters up to 100KHz
- Electronic Welders at $f_{sw}>20KHz$

Application

- Welding inverters

Advantages

- Space and weight savings
- Reduced protection circuits

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IGBT Modules For Welding Application

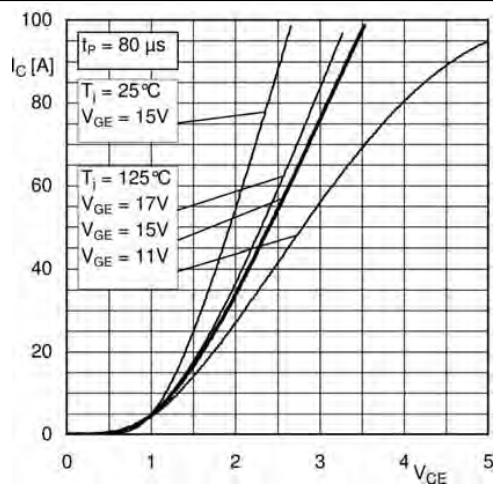


Fig. 1 Typ. output characteristic, inclusive R_{CC+EE}

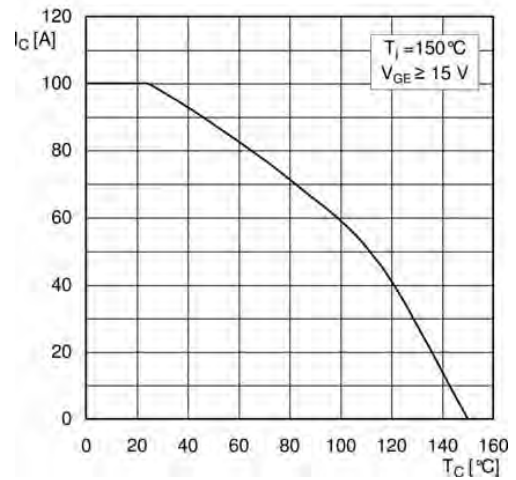


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

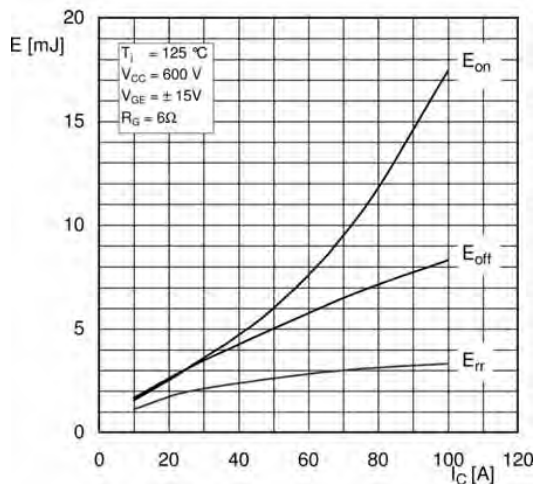


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

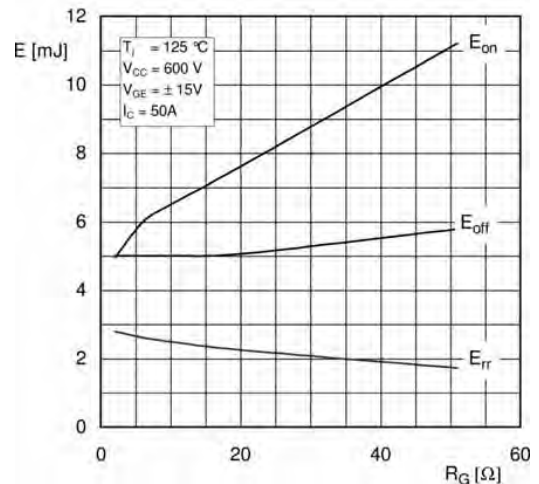


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

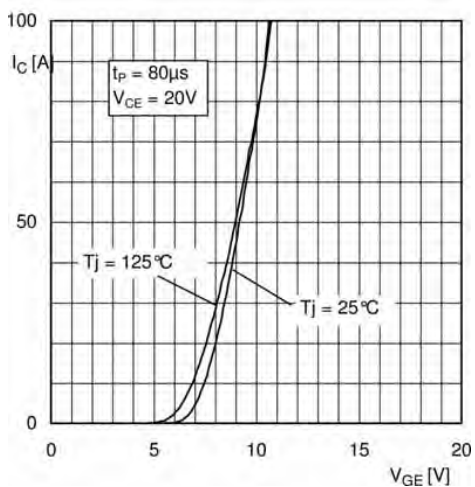


Fig. 5 Typ. transfer characteristic

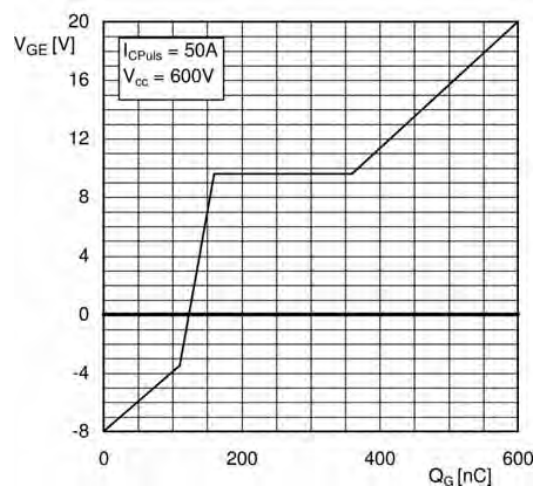


Fig. 6 Typ. gate charge characteristic

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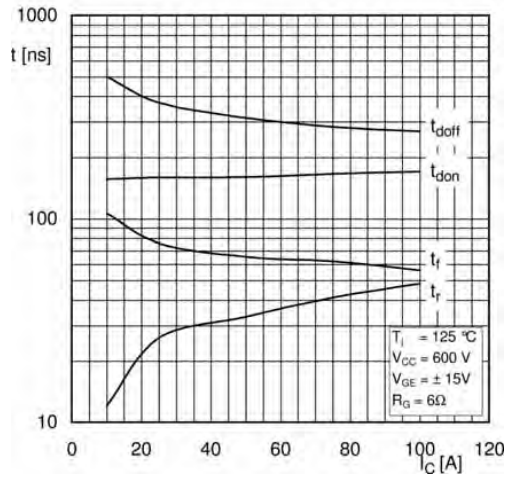


Fig. 7 Typ. switching times vs. I_C

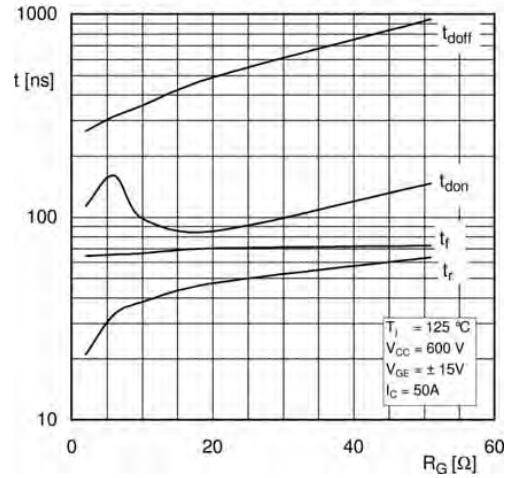


Fig. 8 Typ. switching times vs. gate resistor R_G

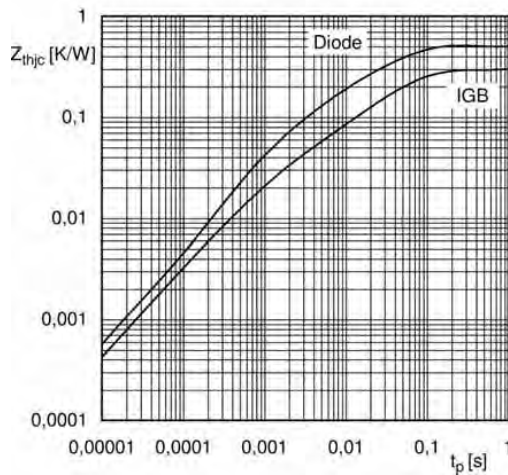


Fig. 9 Transient thermal impedance

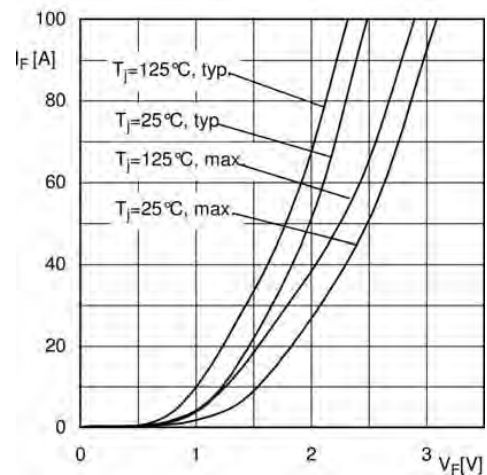


Fig. 10 FWD diode forward characteristic

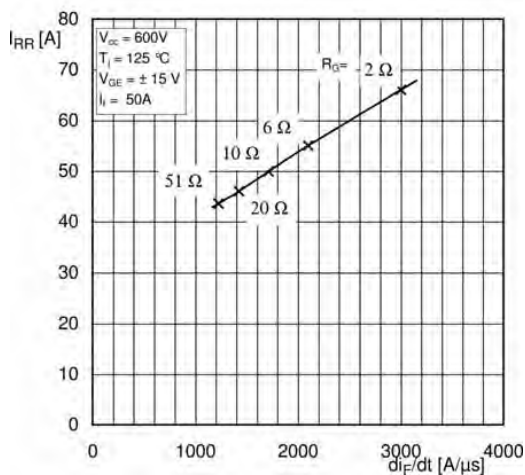


Fig. 11 Typ. FWD diode peak reverse recovery current

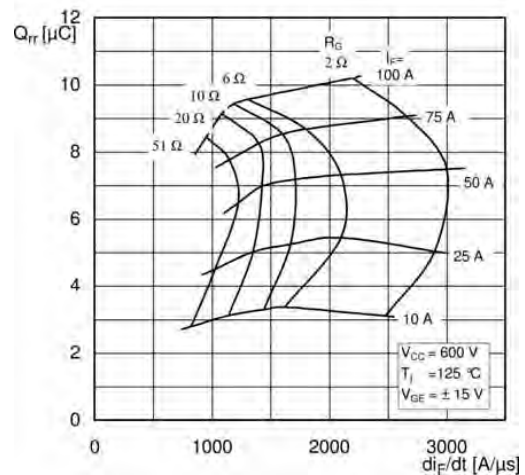


Fig. 12 Typ. FWD diode peak reverse recovery charge

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