

S4G75T60SC9

4 Units H bridge IGBT modules



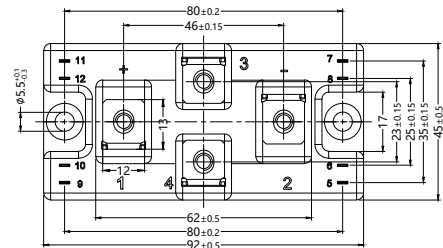
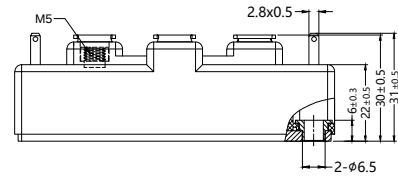
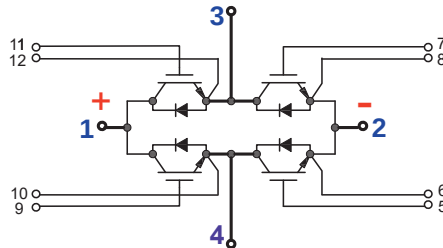
$$V_{CES}=1200V$$

$$I_{C100}=4 \times 75A$$

$$V_{CE(sat)} \leq 2.10V$$

$$t_{fi(typ)}=49ns$$

Dimension: mm



Absolute Maximum Ratings

Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j =25°C		600	V
I _C	T _j =175°C	T _C =25°C	150	A
		T _C =100°C	75	A
I _{Cnom}	T _C =100°C Every chip		75	A
I _{CRM}	I _{CRM} =3×I _{Cnom}		150	A
V _{GES}			±20	V
tpsc	V _{CC} =800V V _{GE} ≤15V V _{GES} ≤1200V	T _j =150°C	10	μs
T _j			-40...175	°C

Inverse Diode

I_F	$T_j=175^{\circ}C$	$T_c=25^{\circ}C$	50	A
		$T_c=100^{\circ}C$	35	A
I_{Fnom}			35	A
I_{FRM}	$I_{FRM}=3 \times I_{Fnom}$		75	A
I_{FSM}	$t_P=10ms$; $\sin 180^{\circ}$; $T_j=25^{\circ}C$		75	A
T_j			-40...+150	$^{\circ}C$

Module

$I_{t(RMS)}$	$T_{terminal} = 80^{\circ}C$	75	A
T_{stg}		-40...125	$^{\circ}C$
V_{isol}	AC sinus 50 Hz, $t=1min$	4000	V

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _C =75A	T _j =25°C		1.55	1.90	V
	V _{GE} =15V chiplevel	T _j =150°C		1.85	2.15	V
V _{CE0}	chiplevel	T _j =25°C		0.80	0.90	V
		T _j =150°C		0.70	0.80	V
r _{CE}	V _{GE} =15V	T _j =25°C		3.20	3.60	
	chiplevel	T _j =150°C		3.50	3.90	
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 3mA		5	5.8	6.5	V
I _{CES}	V _{GE} =0V	T _j =25°C			1	mA
	V _{CE} = 600 V	T _j =150°C				mA
C _{ies}	V _{CE} =25V	f=1MHz		3.20		nF
C _{oes}	V _{GE} =0V	f=1MHz		0.98		nF
C _{res}		f=1MHz		0.09		nF
Q _G	V _{GE} = - 8 V...+ 15 V			415		nC
R _{Gint}	T _j =25°C			10		
t _{d(on)}	V _{CC} = 300 V I _C =75A V _{GE} =±15V R _{Gon} =1Ω R _{Goff} = 1Ω di/dt _{on} = 1600 A/μs di/dt _{off} =950A/μs	T _j =150°C		24		ns
t _r		T _j =150°C		15		ns
E _{on}		T _j =150°C		0.33		mJ
t _{d(off)}		T _j =150°C		175		ns
t _f		T _j =150°C		55		ns
E _{off}		T _j =150°C		2.0		mJ
R _{th(j-c)}	per IGBT				0.175	K/W



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Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _F =35A	T _J =25°C		1.70	2.00	V
	V _{GE} =0V chiplevel	T _J =150°C		1.60	1.90	V
V _{F0}	chiplevel	T _J =25°C		1.30	1.50	V
		T _J =150°C		0.90	1.10	V
r _F	chiplevel	T _J =25°C		19	23	mΩ
		T _J =150°C		26	28	mΩ
I _{RRM}	I _F =35A di/dt _{off} =990A/μs V _{GE} =±15V V _{CC} = 600 V	T _J =150°C		37		A
Q _{rr}		T _J =150°C		2.6		μC
E _{rr}		T _J =150°C		0.35		mJ
R _{th(j-c)}	per diode				0.77	K/W
Module						
L _{CE}				30		nH
R _{CC'+EE'}	measured per switch	T _C =25°C		0.65		mΩ
R _{th(c-s)}		T _C =125°C		1.09		mΩ
	calculated without thermal coupling (λ _{grease} =0.81 W/(m*K))			0.04	0.05	K/W
	M _s	to heat sink M5		3	5	Nm
M _t	to terminals M5		2.5	5	Nm	
						Nm
w					170	g

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Features

- Trench 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 $f_{sw} > 20\text{KHz}$
- Resonant inverters up to 100KHz
- Electronic Welders at $f_{sw} > 20\text{KHz}$

Application

- Welding inverters

Advantages

- Space and weight savings
- Reduced protection circuits

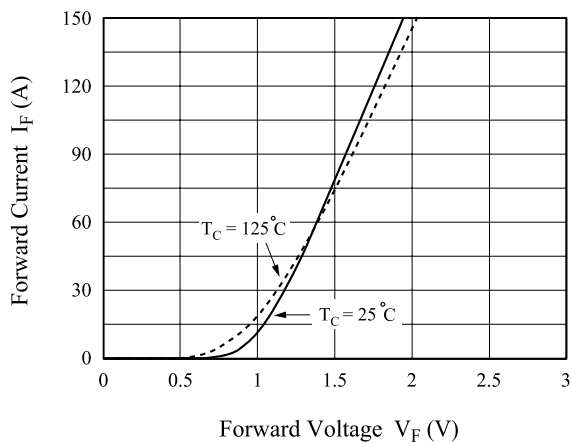


Fig 1. Forward Characteristics

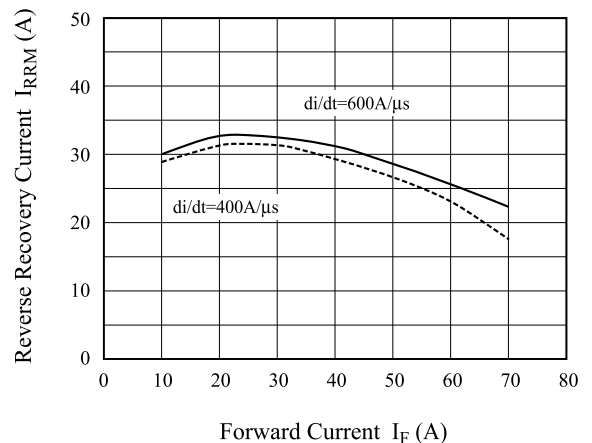


Fig 2. Reverse Recovery Current

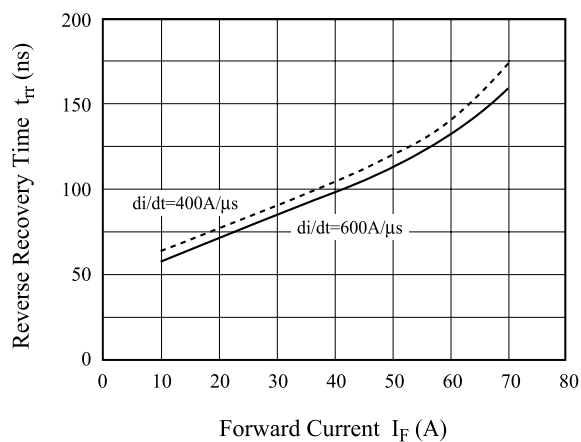


Fig 3. Reverse Recovery Time

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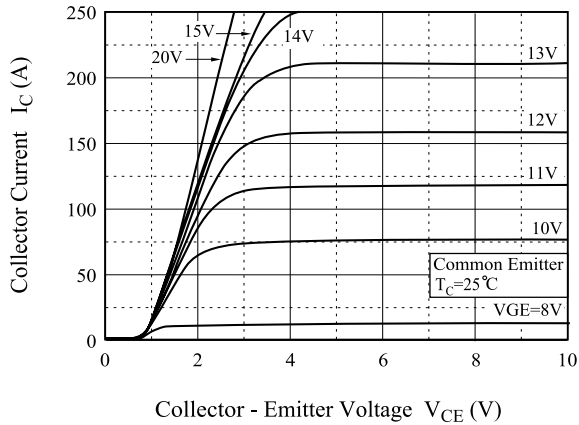


Fig 4. Saturation Voltage Characteristics

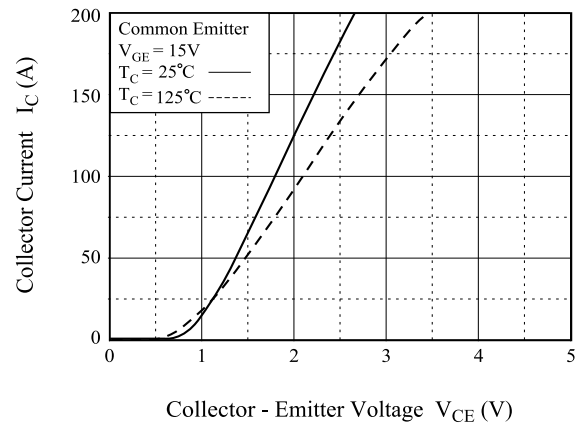


Fig 5. Saturation Voltage Characteristics

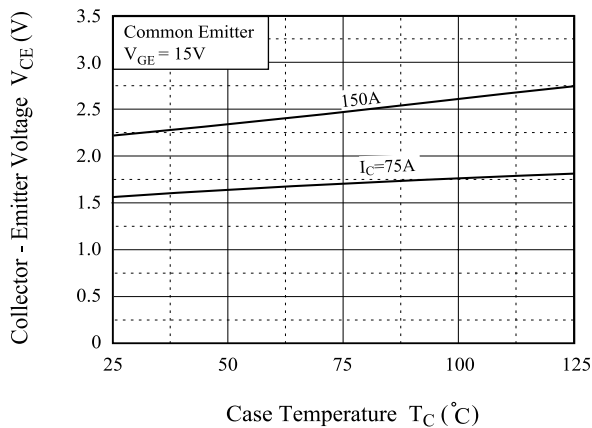


Fig 6. Saturation Voltage vs. Case Temperature

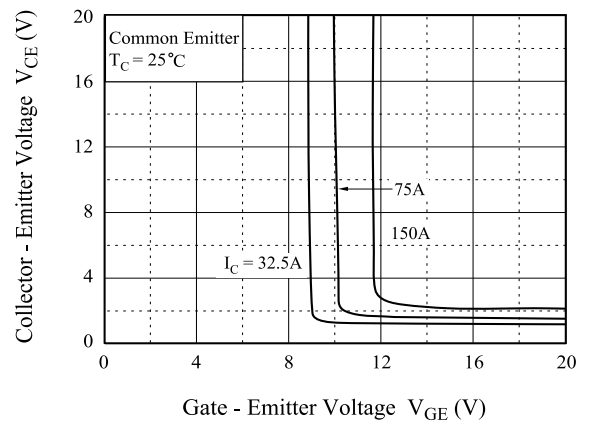


Fig 7. Saturation Voltage vs. V_{GE}

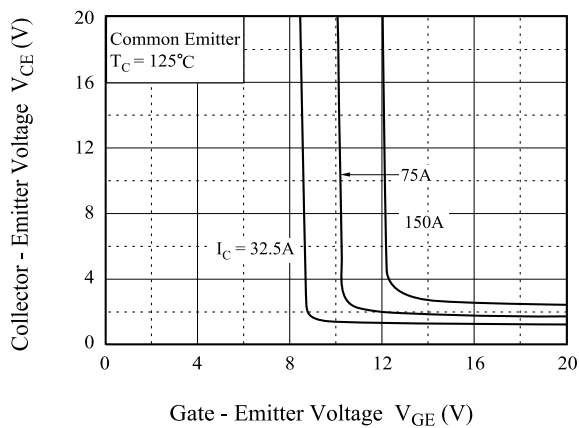


Fig 8. Saturation Voltage vs. V_{GE}

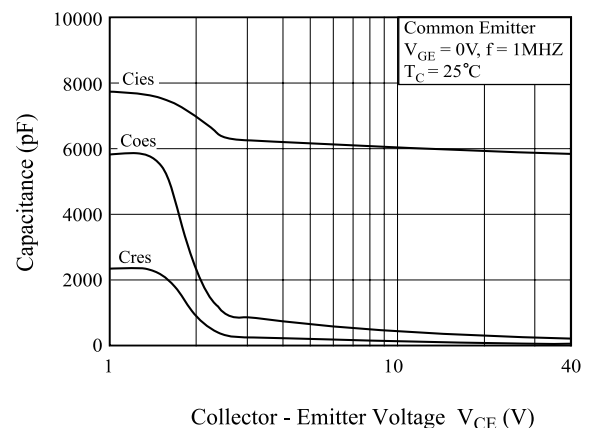


Fig 9. Capacitance Characteristics

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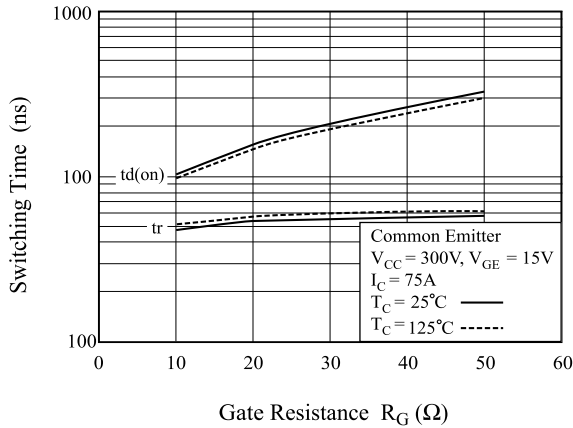


Fig 10. Turn-On Characteristics vs. Gate Resistance

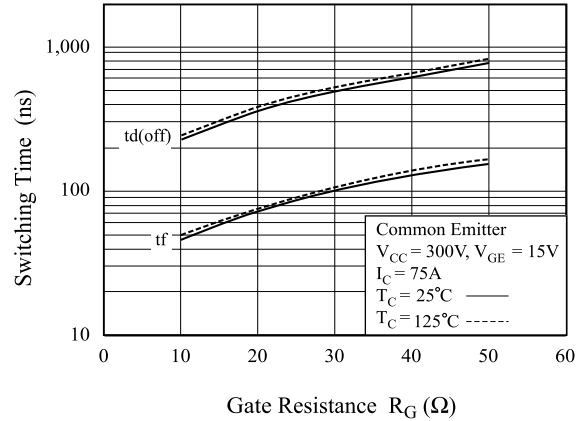


Fig 11. Turn-Off Characteristics vs. Gate Resistance

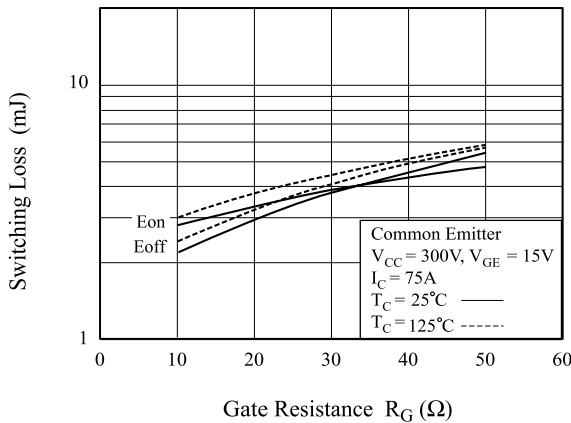


Fig 12. Switching Loss vs. Gate Resistance

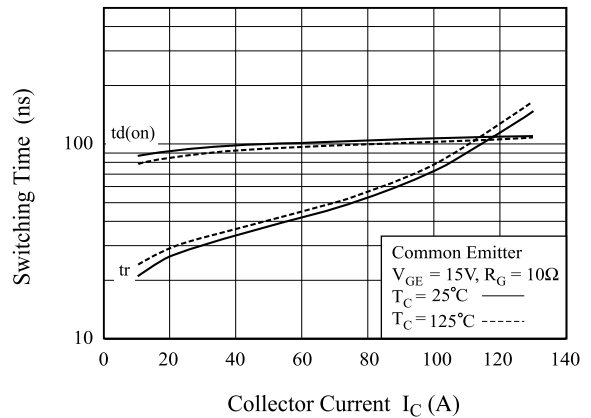


Fig 13. Turn-On Characteristics vs. Collector Current

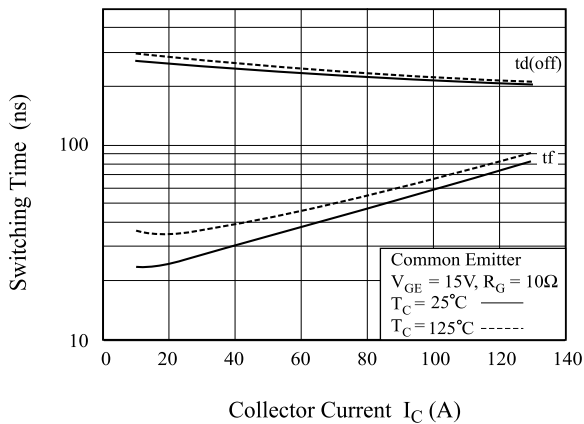


Fig 14. Turn-Off Characteristics vs. Collector Current

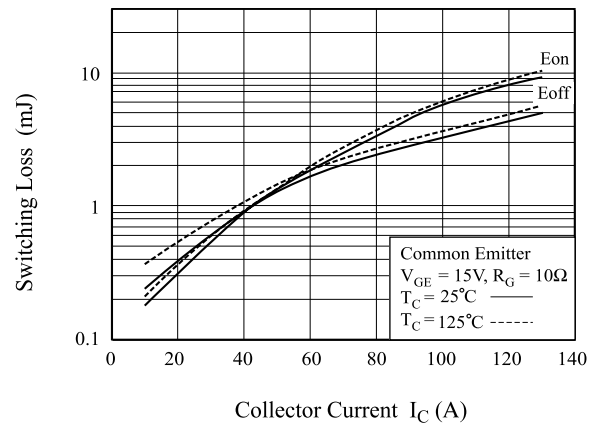


Fig 15. Switching Loss vs. Collector Current

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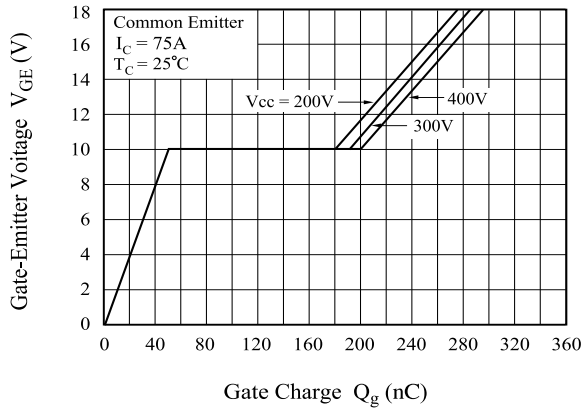


Fig 16. Gate Charge Characteristics

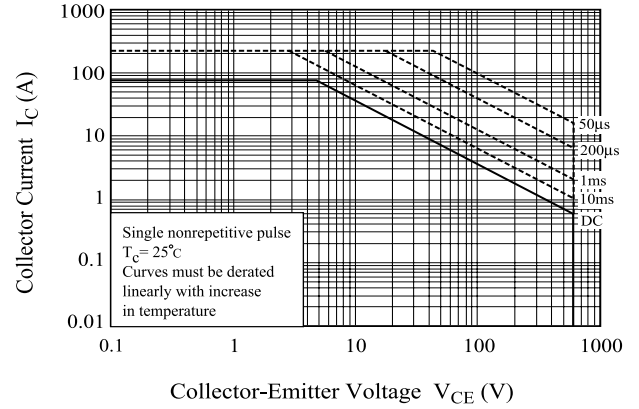


Fig 17. SOA Characteristics

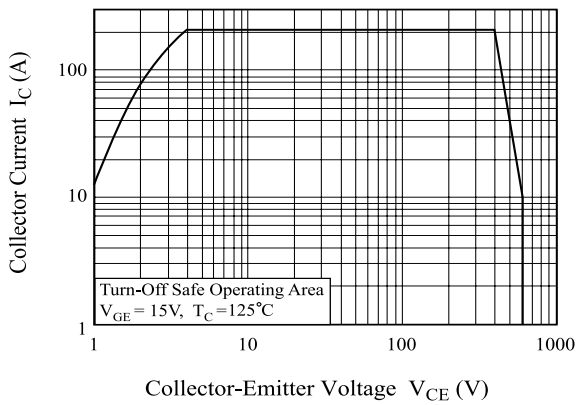
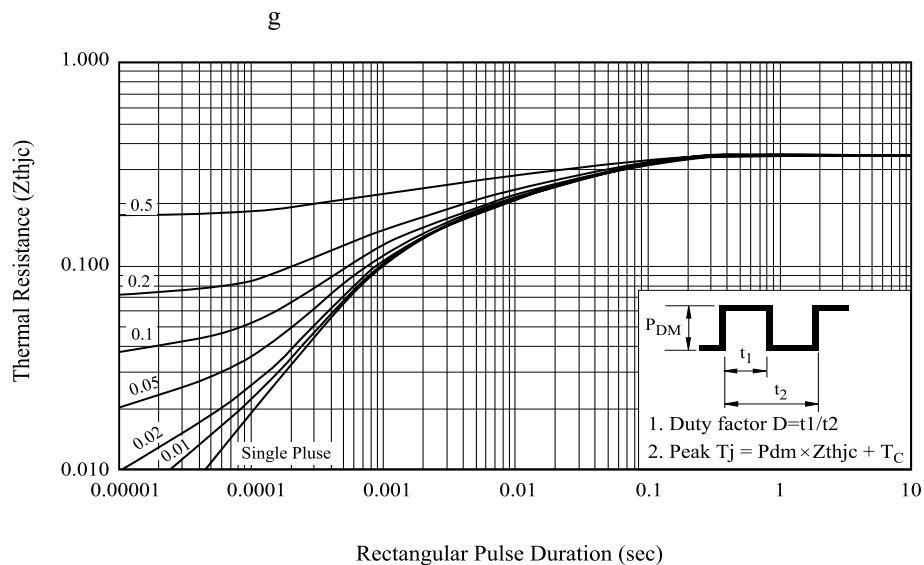


Fig 18. Turn-Off SOA



Fi 19. Transient Thermal Impedance of IGBT