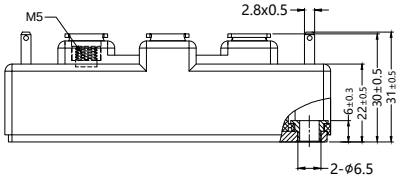
S4G25T120SC9

H bridge IGBT modules

Dimension: mm

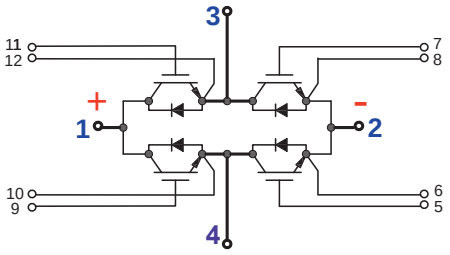


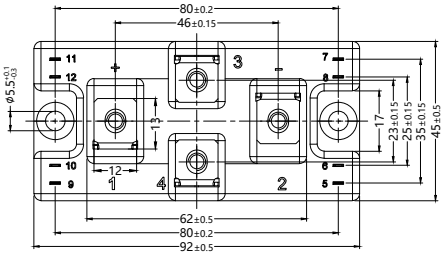
V_{CES} = 1200V

I_{C100} = 4X25A

$V_{CEsat(typ)}$=2.00V

$E_{off(typ)}$ = 0.65mJ





Absolute Maximum Ratings				
Symbol	**Test Conditions**		**Values**	**Unit**
IGBT				
V_{CES}	T_j =25°C		1200	V
I_C	T_j = 175 °C	T_C =25°C	50	A
		T_C =80°C	25	A
I_{Cnom}	T_C = 100 °C Every chip		25	A
I_{CRM}	I_{CRM} = 3xI_{Cnom}		75	A
V_{GES}			-20 ... +20	V
tpsc	V_{CC} = 600 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j =150°C	10	µs
T_j			-40 ... +150	°C
Inverse diode				
I_F	T_j = 175 °C	T_c =25°C	40	A
		T_c =80°C	20	A
I_{Fnom}			40	A
I_{FRM}	I_{FRM} = 3xI_{Fnom}		120	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j =25°C		90	A
T_j			-40 ... +150	°C
Module				
$I_{t(RMS)}$	Tterminal =80°C		125	A
T_{stg}			-40 ... 125	°C
V_{Isol}	AC sinus 50 Hz, t = 1 min		4000	V

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H bridge IGBT modules

Characteristics						
Symbol	**Test Conditions**		**min.**	**typ.**	**max.**	**Unit**
IGBT						
$V_{CE(sat)}$	I_C =25A V_{GE} =15V	T_j =25°C		2.00	2.45	V
	chip level	T_j =150°C		2.60		V
V_{CE0}	chiplevel	T_j =25°C		0.8	0.9	V
		T_j =150°C		0.7	0.8	V
r_{CE}	V_{GE} =15V	T_j =25°C		14.00	16.00	mΩ
	chiplevel	T_j =150°C		21.00	22.00	mΩ
$V_{GE(th)}$	V_{GE}=V_{CE}, I_C = 1.7 mA		5	5.8	6.5	V
I_{CES}	V_{GE} =0V	T_j =25°C			0.1	mA
	V_{CE} = 1200 V	T_j =150°C			1	mA
C_{ies}	V_{CE} =25V	f=1MHz		1.80		nF
C_{oes}	V_{GE} =0V	f=1MHz		0.07		nF
C_{res}		f=1MHz		0.045		nF
Q_G	V_{GE} = - 8 V...+ 15 V			140		nC
R_{Gint}	T_j =25°C			4.0		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C =25A V_{GE} =±15V R_{Gon} =1Ω R_{Goff} =1Ω di/dt_{on} = 1700 A/µs di/dt_{off} =670A/µs	T_j =25°C		61		ns
t_r		T_j =25°C		22		ns
E_{on}		T_j =25°C		3.3		mJ
$t_{d(off)}$		T_j =25°C		295		ns
t_f		T_j =25°C		94		ns
E_{off}		T_j =25°C		0.65		mJ
$R_{th(j-c)}$	per IGBT				0.66	K/W

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Characteristics						
Symbol	**Test Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse diode						
$V_F = V_{EC}$	I_F = 20 A V_{GE} = 0 V chiplevel	T_j = 25 °C		1.90	2.54	V
		T_j = 150 °C		2.08	2.60	V
V_{F0}	chiplevel	T_j = 25 °C		1.3	1.5	V
		T_j = 150 °C		0.9	1.1	V
r_F	chiplevel	T_j = 25 °C		18.0	20.0	mΩ
		T_j = 150 °C		25.0	28.0	mΩ
I_{RRM}	I_F = 20 A di/dt_{off} = 1380 A/µs V_{GE} = ±15 V V_{CC} = 600 V	T_j = 150 °C		20		A
Q_{rr}		T_j = 150 °C		8.0		µC
E_{rr}		T_j = 150 °C		3.0		mJ
$R_{th(j-c)}$	per diode				0.88	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	terminal-chip	T_C = 25 °C		0.65		mΩ
		T_C = 125 °C		1		mΩ
$R_{th(c-s)}$	per module			0.06	0.07	K/W
M_s	to heat sink M5		3		5	Nm
M_t		to terminals M5	2.5		5	Nm
						Nm
Weight					170	g

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H bridge IGBT modules

Features

• Trench Field Stop technology
• Ultra fast free wheeling diodes technology
• Low switching losses
• Switching frequency up to 30KHz
• Positive temperature coefficient for easy parallelling
• MOS input, voltage controlled

Application

• AC and DC motor control
• AC servo and robot drives
• Power supplies
• Welding inverters

Advantages

• space and weight savings
• reduced protection circuits

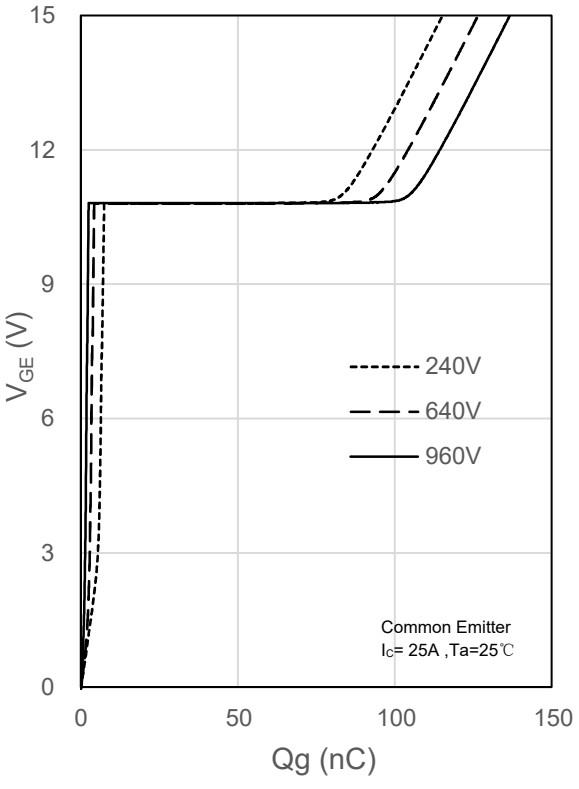

Fig. 1 Gate charge characteristics

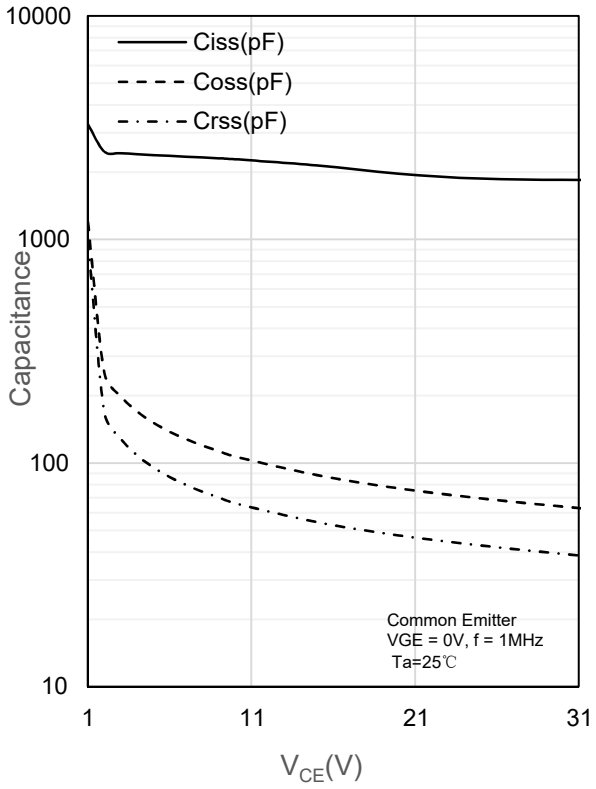

Fig. 2 Capacitance characteristics

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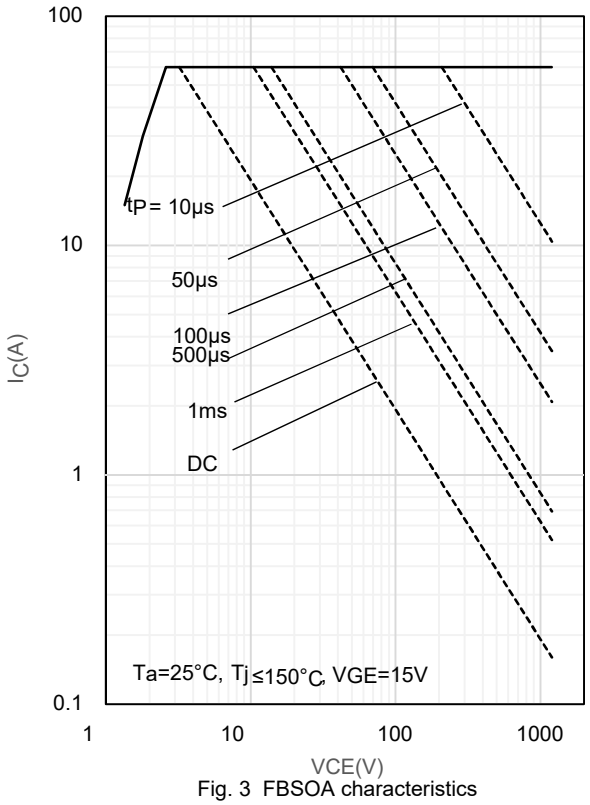

Fig. 3 FBSOA characteristics

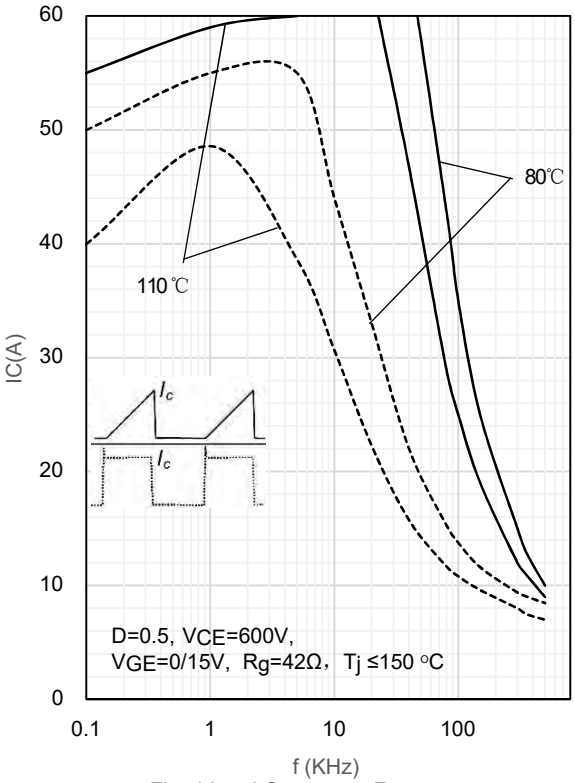

Fig. 4 Load Current vs. Frequency

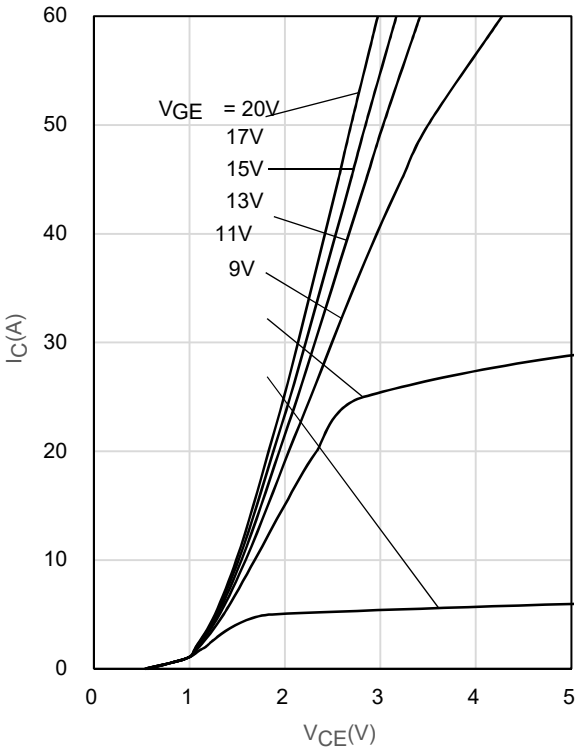

Fig. 5 Output characteristics

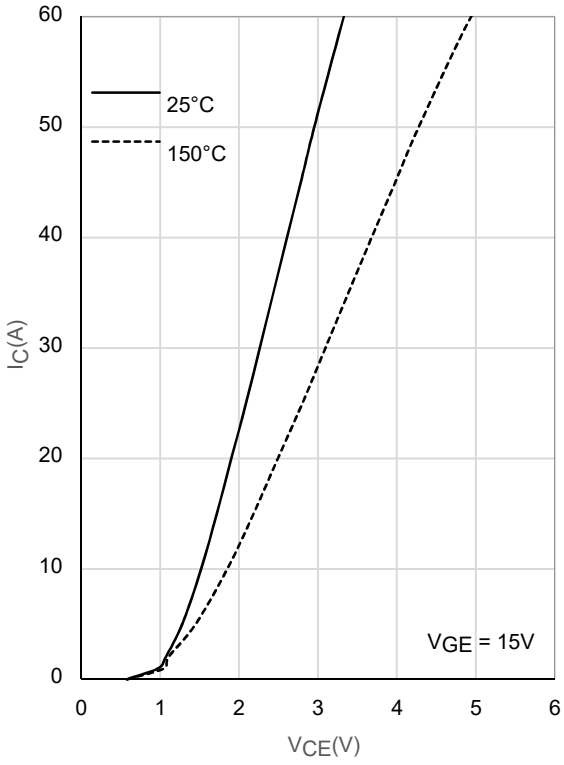

Fig. 6 Saturation voltage characteristics

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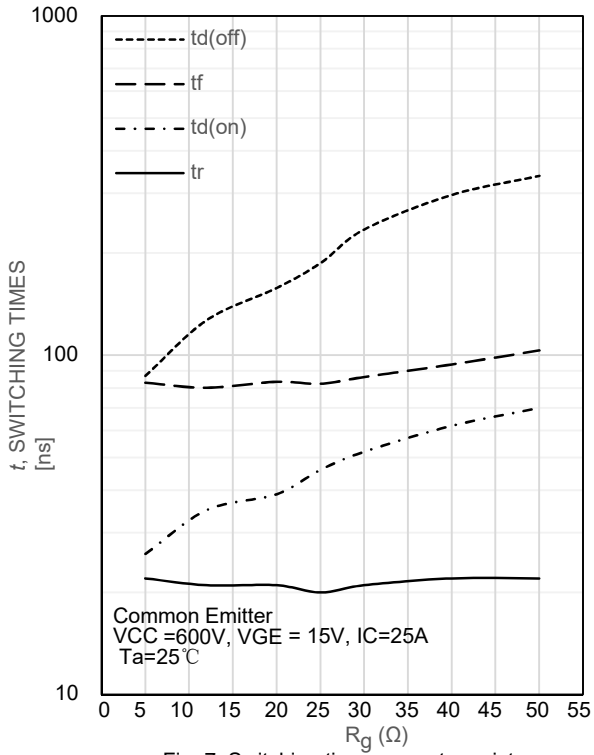

Fig. 7 Switching times vs. gate resistor

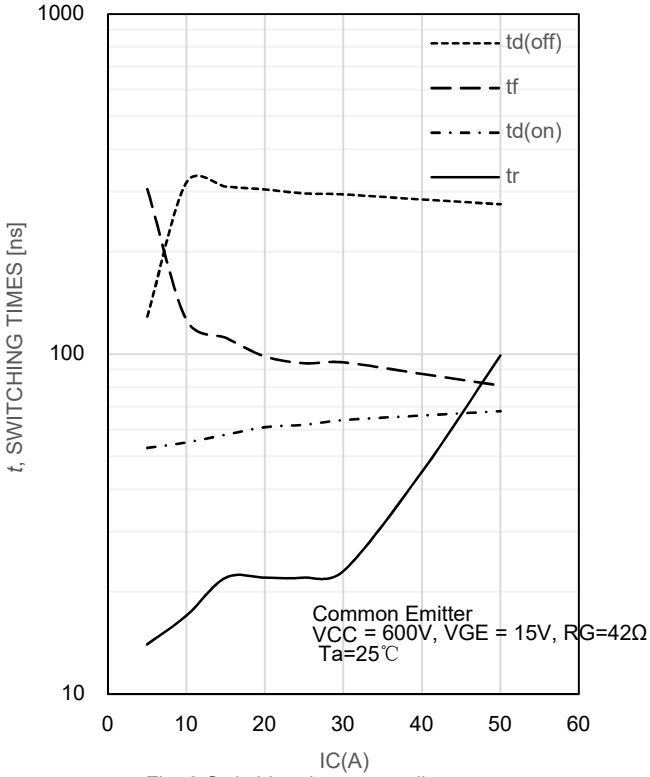

Fig. 8 Switching times vs. collector current

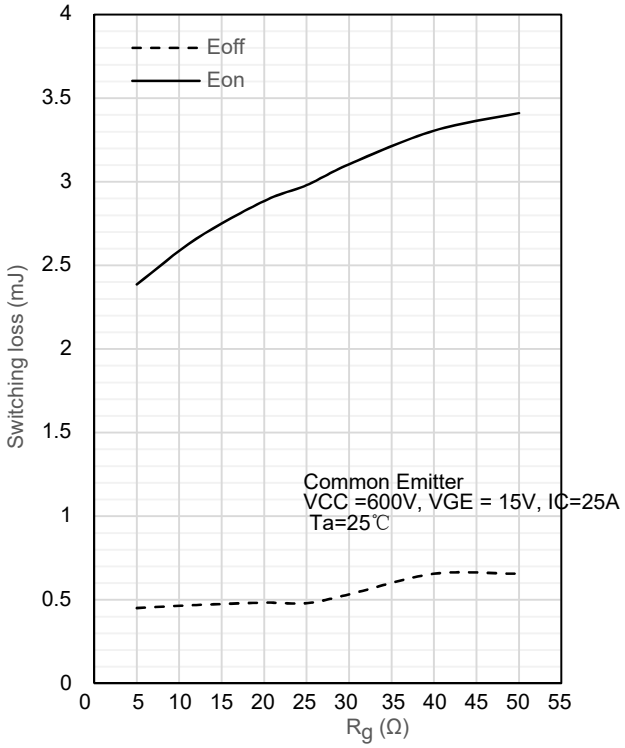

Fig. 9 Switching loss vs. gate resistor

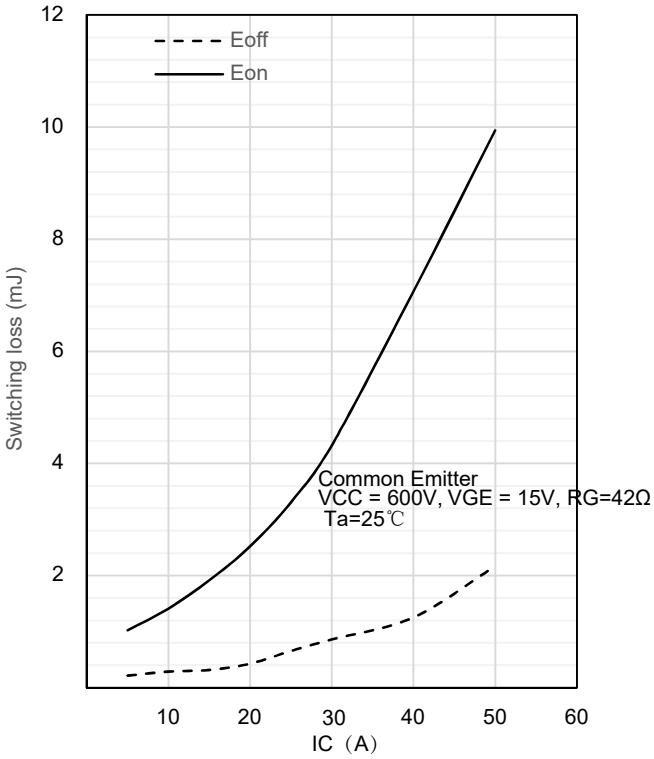

Fig. 10 Switching loss. collector current

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