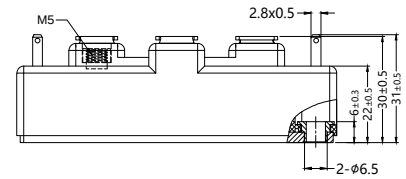


H bridge IGBT modules

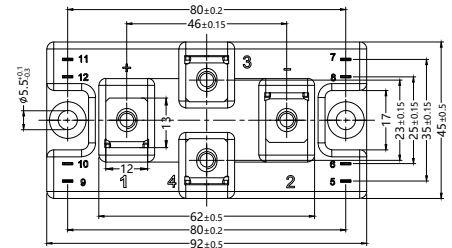
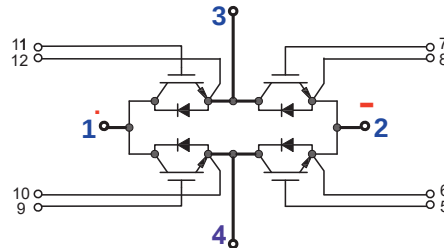


Dimension: mm


$$V_{CES} = 1200V$$
$$I_{C25} = 4 \times 60A$$

$V_{CEsat}(typ) = 1.85V$

$E_{\text{off(typ)}} = 1.13 \text{ mJ}$



Absolute Maximum Ratings

Symbol	Test Conditions		Values	Unit
IGBT				
V_{CES}	$T_j = 25\text{ °C}$		600	V
I_C	$T_j = 175\text{ °C}$	$T_C = 25\text{ °C}$	120	A
		$T_C = 100\text{ °C}$	60	A
I_{Cnom}	$T_C = 100\text{ °C}$ Every chip		60	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$		180	A
V_{GES}			-20 ... +20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150\text{ °C}$	5	μs
T_j			-40 ... 175	°C
Inverse diode				
I_F	$T_j = 175\text{ °C}$	$T_C = 25\text{ °C}$	120	A
		$T_C = 100\text{ °C}$	60	A
I_{Fnom}			60	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$		180	A
I_{FSM}	$t_p = 10\text{ ms}$, $\sin 180^\circ$, $T_j = 25\text{ °C}$		180	A
T_j			-40 ... 150	°C
Module				
$I_{t(RMS)}$	$T_{terminal} = 80\text{ °C}$		100	A
T_{stg}			-40 ... 125	°C
V_{Isol}	AC sinus 50 Hz, $t = 1\text{ min}$		4000	V

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H bridge IGBT modules

Characteristics

Symbol	Test Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _C =60A	T _J =25°C	1.85		2.30	V
	V _{GE} =15V chiplevel	T _J =150°C	2.25			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	24.00		28.00	mΩ
	chiplevel	T _J =150°C	33.00		38.00	mΩ
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 1.0 mA		4	5.0	6.0	V
I _{CES}	V _{GE} =0V	T _J =25°C			0.1	mA
	V _{CE} = 600 V	T _J =150°C			5	mA
C _{ies}	V _{CE} =25V V _{GE} =0V	f=1MHz	3.67			nF
C _{oes}		f=1MHz	0.16			nF
C _{res}		f=1MHz	0.10			nF
Q _G	V _{GE} = - 8 V...+ 15 V		380			nC
R _{Gint}	T _J =25°C		0.2			Ω
t _{d(on)}	V _{CC} = 300 V I _C =60A V _{GE} =±15V R _{G on} =6Ω R _{G off} =6Ω di/dt _{on} = 1700 A/μs di/dt _{off} =670A/μs	T _J =150°C	27			ns
t _r		T _J =150°C	39			ns
E _{on}		T _J =150°C	2.55			mJ
t _{d(off)}		T _J =150°C	300			ns
t _f		T _J =150°C	23			ns
E _{off}		T _J =150°C	1.13			mJ
R _{th(j-c)}		per IGBT				0.47

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H bridge IGBT modules

Characteristics

Symbol	Test Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _F = 60A	T _J = 25 °C	1.65		2.00	V
	V _{GE} = 0 V chiplevel	T _J = 150 °C	1.60			V
V _{F0}	chiplevel	T _J = 25 °C	1.15		1.45	V
		T _J = 150 °C	0.85		1.05	V
r _F	chiplevel	T _J = 25 °C	16.7		18.6	mΩ
		T _J = 150 °C	23.5		26.5	mΩ
I _{RRM}	I _F = 60A	T _J =25°C	15			A
Q _{rr}	di/dt _{off} = 1380 A/μs	T _J =25°C	1.2			μC
E _{rr}	V _{GE} = ±15 V V _{CC} = 600 V	T _J =25°C	1.6			mJ
R _{th(j-c)}	per diode				0.63	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		0.03		0.04	K/W
M _s	to heat sink M5		3		5	Nm
M _t		to terminals M5	2.5		5	Nm
						Nm
Weight					170	g

Features

- Trench Field Stop technology
- Low switching losses
- Switching frequency up to 50kHz
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Soft switching FRD diode Technology
- Package with copper baseplate

Application

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

Advantages

- Space and weight savings
- Reduced protection circuits



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H bridge IGBT modules

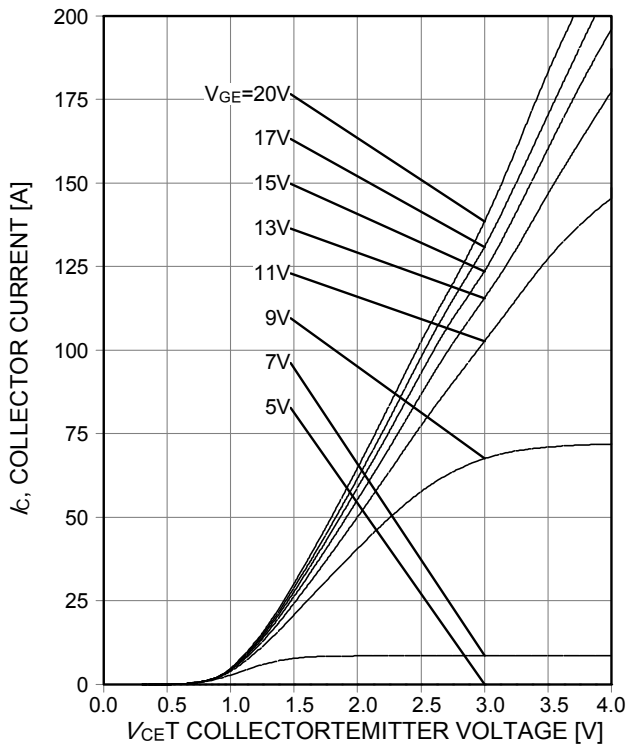


Fig.1 Typical output characteristic (25°C)

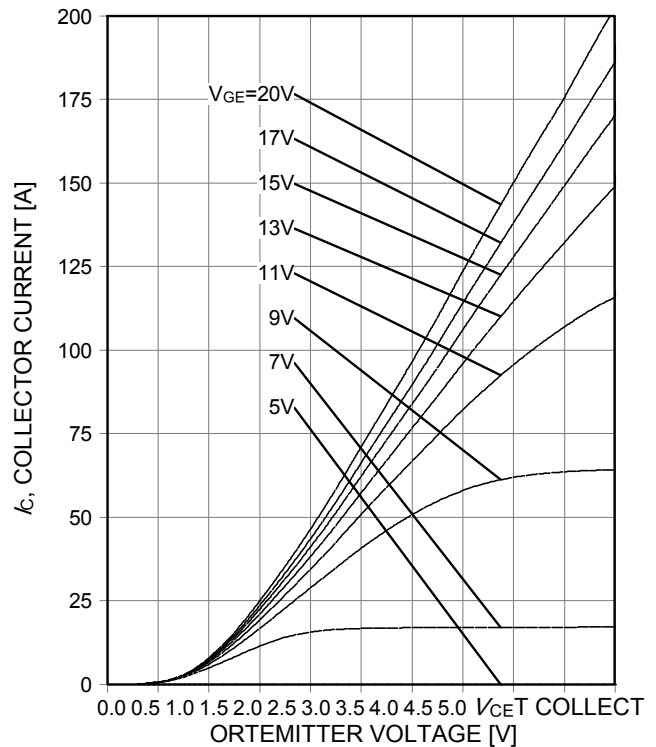


Fig.2 Typical output characteristic (125°C)

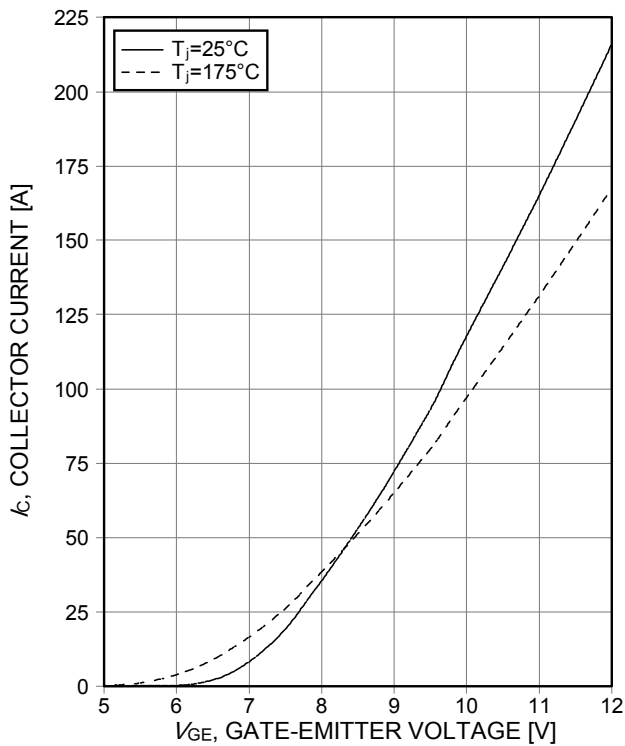


Fig.3 Typical Transfer Characteristic ($V_{CE}=20\text{V}$)

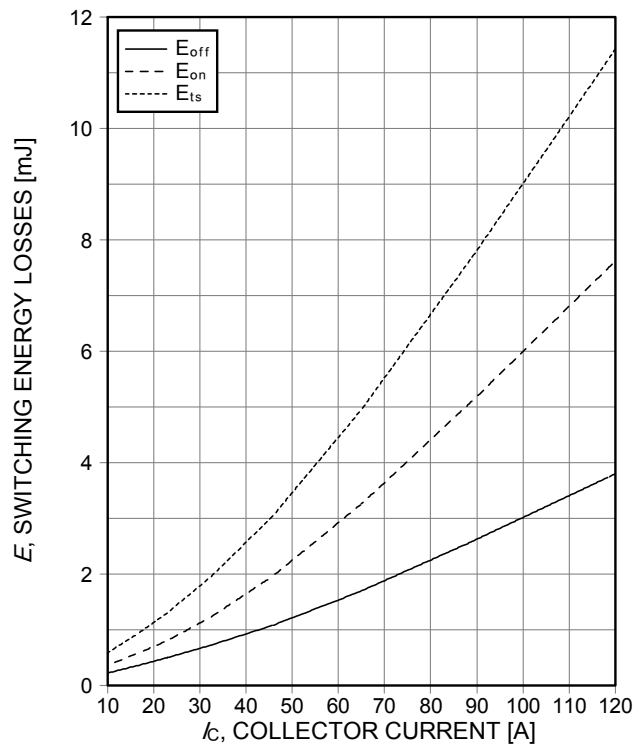


Fig.4 Typical switching Energy losses as a function of collector current

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