

IGBT Modules

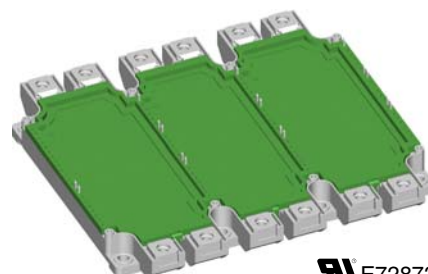
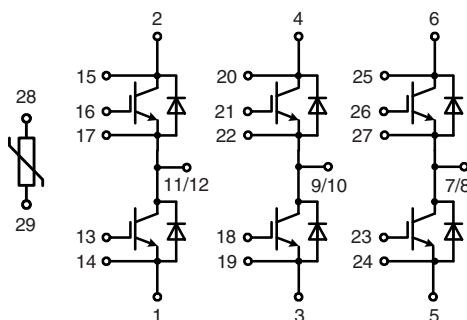
Sixpack

NPT³ IGBT

$$I_{C80} = 235 \text{ A}$$

$$V_{CES} = 1700 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 2.5 \text{ V}$$



E72873

See outline drawing for pin arrangement

IGBTs

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C to } 125^{\circ}\text{C}$	1700	V
V_{GES}		± 20	V
I_{C25}	$T_C = 25^{\circ}\text{C}$	335	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	235	A
RBSOA	$R_G = 5 \Omega$; $T_{VJ} = 125^{\circ}\text{C}$ Clamped inductive load; $L = 100 \mu\text{H}$	$I_{CM} = 470$ $V_{CEK} \leq V_{CES}$	A
t_{SC} (SCSOA)	$V_{CE} = 1200 \text{ V}$; $V_{GE} = \pm 15 \text{ V}$; $R_G = 5 \Omega$; $T_{VJ} = 125^{\circ}\text{C}$; non-repetitive; $V_{CEmax} \leq V_{CES}$	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	1.4	kW

Features

- €NPT³ IGBT technology
- €low saturation voltage
- €low switching losses
- €square RBSOA, no latch up
- €high short circuit capability
- €positive temperature coefficient for easy parallelling
- €MOS input, voltage controlled
- €ultra fast free wheeling diodes
- €solderable pins for PCB mounting
- €package with copper base plate

Advantages

- €space savings
- €reduced protection circuits
- €package designed for wave soldering

Typical Applications

- €AC motor control
- €AC servo and robot drives
- €power supplies

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 225 \text{ A}$; $V_{GE} = 15 \text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.5 2.9	2.9 3.4 V
$V_{GE(th)}$	$I_C = 20 \text{ mA}$; $V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}$; $V_{GE} = 0 \text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		4.4	0.6 mA mA
I_{GES}	$V_{CE} = 0 \text{ V}$; $V_{GE} = \pm 20 \text{ V}$			500 nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 900 \text{ V}$; $I_C = 200 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$; $R_G = 5 \Omega$		180 110 500 110 66 54	ns ns ns ns mJ mJ
C_{ies}			22	nF
Q_{Gon}			1.72	μC
R_{thJC}				0.085 K/W

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Diodes

Symbol	Conditions	Maximum Ratings	
I_{F80}	$T_C = 80^\circ\text{C}$	200	A
I_{FRM}	$t_p = 1\text{ ms}$	400	A
I^2t	$T_{VJ} = 125^\circ\text{C}; t = 10\text{ ms}; V_R = 0\text{ V}$	5800	A^2s

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 225\text{ A}; V_{GE} = 0\text{ V}; T_{VJ} = 25^\circ\text{C}$			2.4 V
I_{RM}	$I_F = 225\text{ A}; di_F/dt = 1600\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}; V_R = 1150\text{ V}$		160	A
R_{thJC}		0.165		K/W

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k Ω
$B_{25/50}$			3375	K

Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-40...+125	$^\circ\text{C}$
T_{JM}		+150	$^\circ\text{C}$
T_{stg}		-40...+125	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500	V~
M_d	Mounting torque (M5)	3 - 6	Nm
	Terminal connection torque (M6)	3 - 6	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{term-chip}^{*)}$	Resistance terminal to chip		0.55	m Ω
d_S	Creepage distance on surface	12.7		mm
d_A	Strike distance in air	10		mm
R_{thCH}	with heatsink compound		0.01	K/W
Weight			900	g

*) $V = V_{CE(sat)} + 2x R_{term-chip} \cdot I_C$ resp. $V = V_F + 2x R_{term-chip} \cdot I_F$

[illegible]