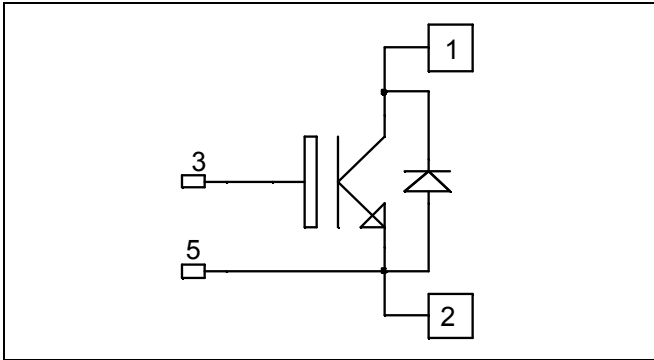


**Single switch  
NPT IGBT Power Module**

**$V_{CES} = 600V$   
 $I_C = 500A @ T_c = 80^\circ C$**

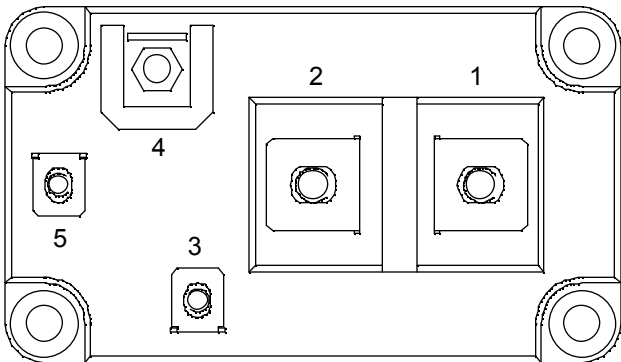


**Application**

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

**Features**

- Non Punch Through (NPT) fast IGBT
  - Low voltage drop
  - Low tail current
  - Switching frequency up to 50 kHz
  - Soft recovery parallel diodes
  - Low diode VF
  - Low leakage current
  - Avalanche energy rated
  - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Low stray inductance
  - M6 connectors for power
  - M4 connectors for signal
- High level of integration



**Benefits**

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	600	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	625
		$T_C = 80^\circ C$	500
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	900
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	2000
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	900A@520V

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

All ratings @  $T_j = 25^\circ\text{C}$  unless otherwise specified

## Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}$ $V_{CE} = 600\text{V}$	$T_j = 25^\circ\text{C}$		1	500	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		1		$\text{mA}$
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15\text{V}$ $I_C = 500\text{A}$	$T_j = 25^\circ\text{C}$		1.95	2.45	V
			$T_j = 125^\circ\text{C}$		2.2		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 6\text{mA}$	4.5	5.5	6.5	V	
$I_{GES}$	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$			400	nA	

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0\text{V}, V_{CE} = 25\text{V}$ $f = 1\text{MHz}$		26		nF
$C_{res}$	Reverse Transfer Capacitance			2.4		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 600\text{A}$ $R_G = 4.7\Omega$		174		ns
$T_r$	Rise Time			80		
$T_{d(off)}$	Turn-off Delay Time			400		
$T_f$	Fall Time			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 600\text{A}$ $R_G = 4.7\Omega$		200		ns
$T_r$	Rise Time			85		
$T_{d(off)}$	Turn-off Delay Time			420		
$T_f$	Fall Time			80		
$E_{on}$	Turn on Energy			11		mJ
$E_{off}$	Turn off Energy			22		

## Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$V_F$	Diode Forward Voltage	$I_F = 600\text{A}$ $V_{GE} = 0\text{V}$	$T_j = 25^\circ\text{C}$		1.25	1.6	V
			$T_j = 125^\circ\text{C}$		1.2		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 600\text{A}$ $V_R = 300\text{V}$ $di/dt = 5600\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		40		$\mu\text{C}$
			$T_j = 125^\circ\text{C}$		66		

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT			0.06	$^\circ\text{C}/\text{W}$
		Diode			0.12	
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1\text{min}, I_{isol} < 1\text{mA}, 50/60\text{Hz}$	2500			V	
$T_j$	Operating junction temperature range	-40		150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-40		125		
$T_C$	Operating Case Temperature	-40		125		
Torque	Mounting torque	M6	3	5		N.m
		M4	1	2		
Wt	Package Weight			420	g	

