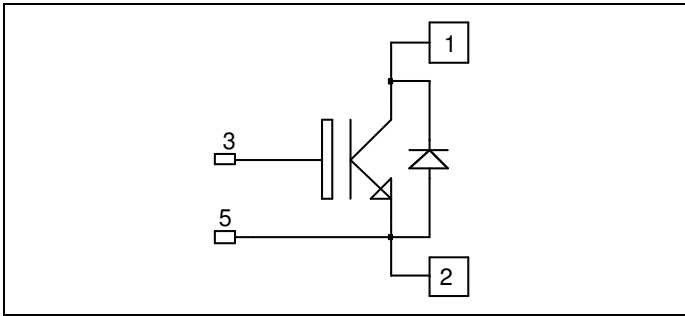


**Single switch
Trench IGBT® Power Module**

**$V_{CES} = 1700V$
 $I_C = 400A @ T_c = 80^\circ C$**

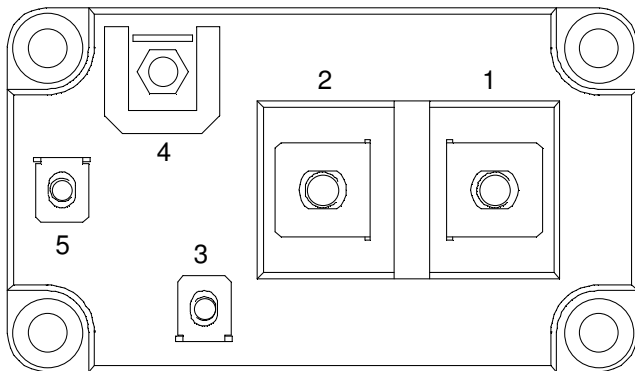


Application

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

Features

- Trench + Field Stop IGBT® Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 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
- High level of integration
- Kelvin emitter for easy drive
- Low stray inductance
 - M6 connectors for power
 - M4 connectors for signal



Benefits

- 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	1700	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$	800
		$T_C = 80^\circ C$	400
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	800
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	2270
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	800A@1650V

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
BV_{CES}	Collector - Emitter Breakdown Voltage	$V_{GE} = 0\text{V}, I_C = 13\text{mA}$	1700			V
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}, V_{CE} = 1700\text{V}$			8	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15\text{V}$ $I_C = 400\text{A}$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	2.0 2.4	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 16\text{mA}$	5.2	5.8	6.4	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	$V_{GE} = 0\text{V}, V_{CE} = 25\text{V}$		33		nF
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		1.2		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 400\text{A}$ $R_G = 3.6\Omega$		250		ns
T_r	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			850		
T_f	Fall Time			120		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 400\text{A}$ $R_G = 3.6\Omega$		300		ns
T_r	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			1000		
T_f	Fall Time			200		
E_{off}	Turn Off Energy			125		mJ

Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_F	Diode Forward Voltage	$I_F = 400\text{A}$ $V_{GE} = 0\text{V}$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.8 1.9	2.2 V
E_r	Reverse Recovery Energy	$I_F = 400\text{A}$ $V_R = 900\text{V}$ $di/dt = 900\text{A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	50 100	mJ
Q_{rr}	Reverse Recovery Charge	$I_F = 400\text{A}$ $V_R = 900\text{V}$ $di/dt = 900\text{A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	100 170	μC

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R_{thJC}	Junction to Case	IGBT			0.055	$^\circ\text{C}/\text{W}$
		Diode			0.08	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1\text{min}$, $I_{isol} < 1\text{mA}$, 50/60Hz	3500			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	

