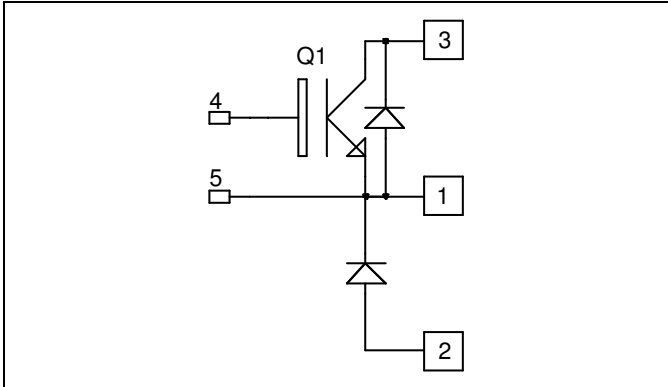


## Buck chopper Trench IGBT® Power Module

$V_{CES} = 1200V$   
 $I_C = 150A @ T_c = 80^\circ C$

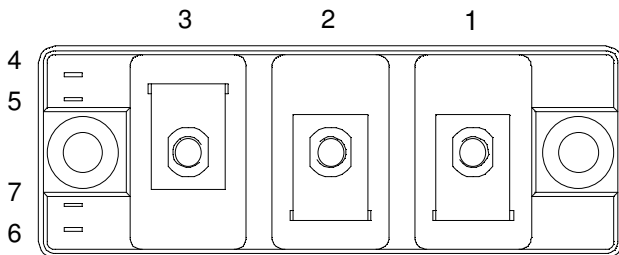


### Application

- AC and DC motor control
- Switched Mode Power Supplies

### 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
  - M5 power connectors
- 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	1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	220
		$T_C = 80^\circ C$	150
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	350
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	700
SCSOA	Short Circuit Safe Operating Area	$T_j = 125^\circ C$	600A@900V

 **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	$V_{GE} = 0V, I_C = 6mA$	1200			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$			4	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 150A$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.7 2.1	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 6mA$	5.0	5.8	6.5	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			600	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V$		10.8		nF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		0.56		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		0.5		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ )		250		ns
$T_r$	Rise Time	$V_{GE} = \pm 15V$		90		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600V$ $I_C = 150A$		550		
$T_f$	Fall Time	$R_G = 4.7\Omega$		130		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ )		300		ns
$T_r$	Rise Time	$V_{GE} = \pm 15V$		100		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600V$ $I_C = 150A$		650		
$T_f$	Fall Time	$R_G = 4.7\Omega$		180		

## Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 150A$ $V_{GE} = 0V$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.6 2.1	V
$E_{rec}$	Reverse Recovery Energy	$I_F = 150A$ $V_R = 600V$ $di/dt = 900A/\mu s$		$T_j = 125^\circ\text{C}$	12	mJ
$Q_{rr}$	Reverse Recovery Charge	$I_F = 150A$ $V_R = 600V$ $di/dt = 900A/\mu s$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	14 28	$\mu C$

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.18	$^\circ\text{C/W}$	
		Diode		0.30		
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1$ min, $I_{isol} < 1mA, 50/60Hz$	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	For terminals	M5	2	3.5	N.m
		To Heatsink	M6	3	5	
Wt	Package Weight			180	g	

