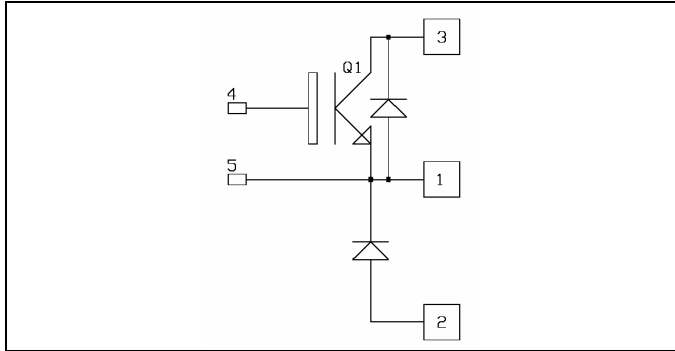


***Buck Chopper  
NPT IGBT Power Module***

**$V_{CES} = 600V$   
 $I_C = 330A @ T_c = 80^\circ C$**



**Application**

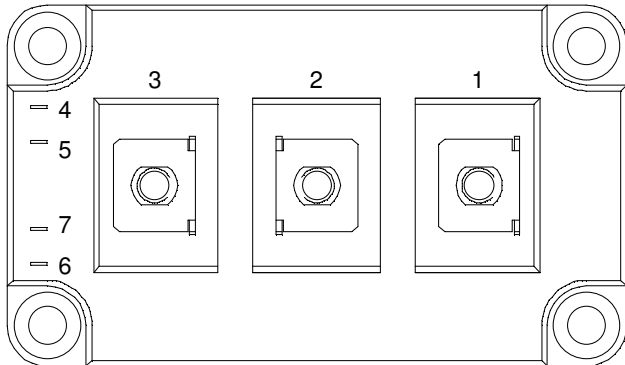
- AC and DC motor control
- Switched Mode Power Supplies

**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 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**

<i>Symbol</i>	<i>Parameter</i>		<i>Max ratings</i>	<i>Unit</i>
$V_{CES}$	Collector - Emitter Breakdown Voltage		600	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	460	A
		$T_C = 80^\circ C$	330	
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	800	
$V_{GE}$	Gate - Emitter Voltage		$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	1400	W
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	800A@420V	

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

## Electrical Characteristics

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

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$BV_{CES}$	Collector - Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 10\text{ mA}$	600			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 600V$	$T_j = 25^\circ\text{C}$	2	750	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$	1.5		mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 400A$	$T_j = 25^\circ\text{C}$	2.0	2.5	V
			$T_j = 125^\circ\text{C}$	2.2		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	4.5		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	$V_{GE} = 0V, V_{CE} = 25V$ $f = 1\text{ MHz}$		18		nF
$C_{res}$	Reverse Transfer Capacitance			1.6		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 400A$ $R_G = 0.82\Omega$		165		ns
$T_r$	Rise Time			40		
$T_{d(off)}$	Turn-off Delay Time			250		
$T_f$	Fall Time			35		
$T_{d(on)}$	Turn-on Delay Time		Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 400A$ $R_G = 0.82\Omega$		180	
$T_r$	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			285		
$T_f$	Fall Time			40		
$E_{off}$	Turn off energy				13	mJ

## Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 400A$ $V_{GE} = 0V$	$T_j = 25^\circ\text{C}$	1.25	1.6	V
			$T_j = 125^\circ\text{C}$	1.2		
$E_r$	Reverse Recovery Energy	$I_F = 400A$ $V_R = 300V$ $di/dt = 900A/\mu\text{s}$		8.2		mJ
$Q_{rr}$	Reverse Recovery Charge	$I_F = 400A$ $V_R = 300V$ $di/dt = 900A/\mu\text{s}$	$T_j = 25^\circ\text{C}$	24		$\mu\text{C}$
			$T_j = 125^\circ\text{C}$	40		

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.089	$^\circ\text{C/W}$	
		Diode		0.15		
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1\text{ min}$ , $I_{isol} < 1\text{ mA}$ , 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	M6	3	5	N.m
		To Heatsink	M6	3	5	
Wt	Package Weight			380	g	

