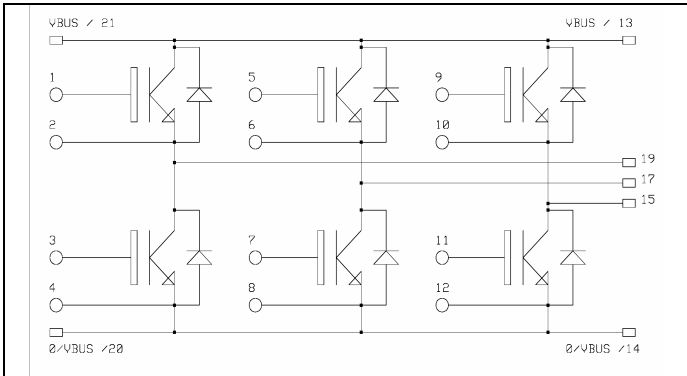


**3 Phase bridge  
NPT IGBT Power Module**

**$V_{CES} = 600V$   
 $I_C = 90A @ T_c = 80^\circ C$**



**Application**

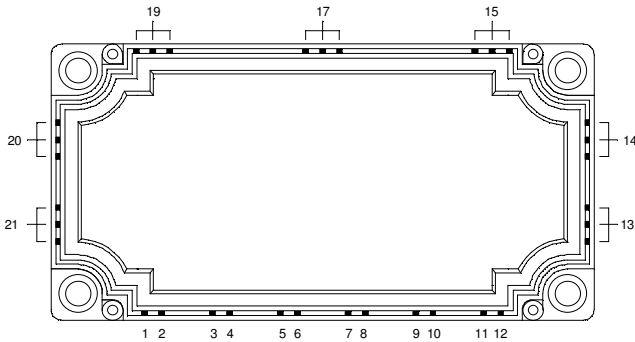
- AC Motor control

**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
- Very low stray inductance
- High level of integration

**Benefits**

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



**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	600	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	130
		$T_C = 80^\circ C$	90
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	230
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	430
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	200A@520V

**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	$V_{GE} = 0V, I_C = 500\mu A$	600			V	
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 600V$	$T_j = 25^\circ\text{C}$	1	500	$\mu A$	
			$T_j = 125^\circ\text{C}$	1		mA	
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ\text{C}$	1.7	2.0	2.45	V
			$T_j = 125^\circ\text{C}$		2.2		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 1.5mA$	4.5		6.5	V	
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			400	nA	

**Dynamic Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$ $f = 1MHz$		4300		pF
$C_{res}$	Reverse Transfer Capacitance			400		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 100A$ $R_G = 2.2\Omega$		25		ns
$T_r$	Rise Time			10		
$T_{d(off)}$	Turn-off Delay Time			130		
$T_f$	Fall Time			20		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 100A$ $R_G = 2.2\Omega$		25		ns
$T_r$	Rise Time			11		
$T_{d(off)}$	Turn-off Delay Time			150		
$T_f$	Fall Time			30		
$E_{off}$	Turn off Energy			2.9		mJ

**Reverse diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$V_F$	Diode Forward Voltage	$I_F = 100A$ $V_{GE} = 0V$	$T_j = 25^\circ\text{C}$		1.25	1.6	V
			$T_j = 125^\circ\text{C}$		1.2		
$E_r$	Reverse Recovery Energy	$I_F = 100A$ $V_R = 300V$ $di/dt = 800A/\mu s$		3.2		mJ	
$Q_{rr}$	Reverse Recovery Charge	$I_F = 100A$ $V_R = 300V$ $di/dt = 800A/\mu s$	$T_j = 25^\circ\text{C}$		7		$\mu C$
			$T_j = 125^\circ\text{C}$		12		

**Thermal and package characteristics**

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.29	$^\circ\text{C/W}$	
		Diode		0.55		
$V_{ISOL}$	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	To heatsink	M5	3	4.5	N.m
Wt	Package Weight				300	g

