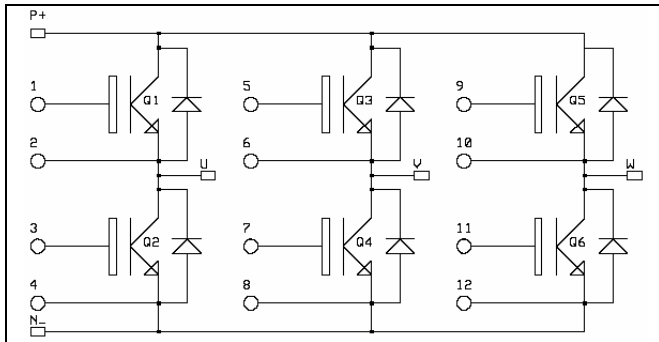


**3 Phase bridge  
NPT IGBT Power Module**

**$V_{CES} = 1700V$   
 $I_C = 50A @ T_c = 80^\circ C$**



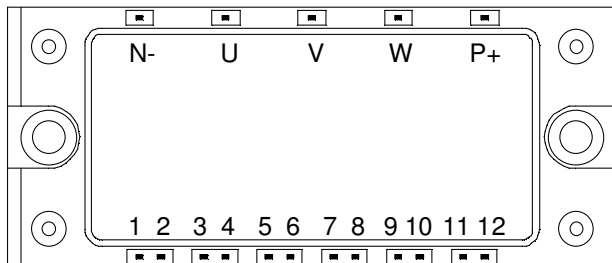
**Application**

- AC Motor control

**Features**

- Non Punch Through (NPT) Low Loss IGBT®
  - 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
- Very low stray inductance
- High level of integration

**Pin out: APTGS50X170E2 (Long pins)**



**Benefits**

- 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

**All ratings @  $T_j = 25^\circ C$  unless otherwise specified**

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1700	V
$I_C$	Continuous Collector Current	$T_c = 25^\circ C$	100
		$T_c = 80^\circ C$	50
$I_{CM}$	Pulsed Collector Current	$T_c = 25^\circ C$	150
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	350
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	100A@1600V

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

## Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$BV_{CES}$	Collector - Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 1mA$	1700			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 1700V$		$T_j = 25^\circ C$ 0.02 $T_j = 125^\circ C$ 1	0.1	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 50A$		$T_j = 25^\circ C$ 2.7 $T_j = 125^\circ C$ 3.2	3.3	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 2.2 mA$	3		6.5	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			100	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$ $f = 1MHz$		3500		pF
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 900V$ $I_C = 50A$ $R_G = 30\Omega$		100		ns
$T_r$	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			800		
$T_f$	Fall Time			30		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = \pm 15V$ $V_{Bus} = 900V$ $I_C = 50A$ $R_G = 30\Omega$		100		ns
$T_r$	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			900		
$T_f$	Fall Time			30		
$E_{off}$	Turn Off Energy			30		mJ

## Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 50A$ $V_{GE} = 0V$		$T_j = 25^\circ C$ 2.2 $T_j = 125^\circ C$ 2.0	2.6	V
$E_r$	Reverse Recovery Energy	$I_F = 50A$ $V_R = 900V$ $di/dt = 750A/\mu s$		$T_j = 25^\circ C$ 2 $T_j = 125^\circ C$ 4		mJ
$Q_{rr}$	Reverse Recovery Charge	$I_F = 50A$ $V_R = 900V$ $di/dt = 750A/\mu s$		$T_j = 25^\circ C$ 6 $T_j = 125^\circ C$ 12		$\mu C$

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.37	°C/W	
		Diode		0.63		
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1 min$ , $I_{isol} < 1mA, 50/60Hz$	3400			V	
$T_j$	Operating junction temperature range	-40		150	°C	
$T_{STG}$	Storage Temperature Range	-40		125		
$T_C$	Operating Case Temperature	-40		125		
Torque	Mounting torque	To Heatsink	M5	2	3.5	N.m
Wt	Package Weight				185	g

