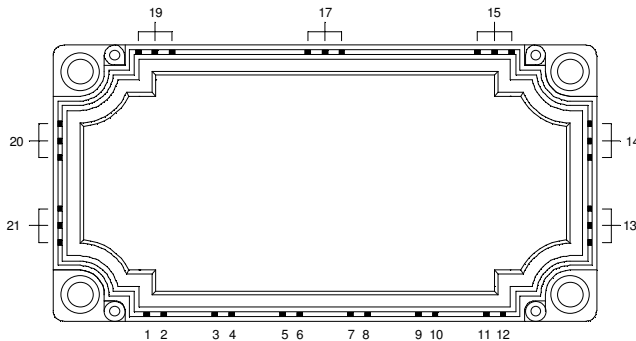
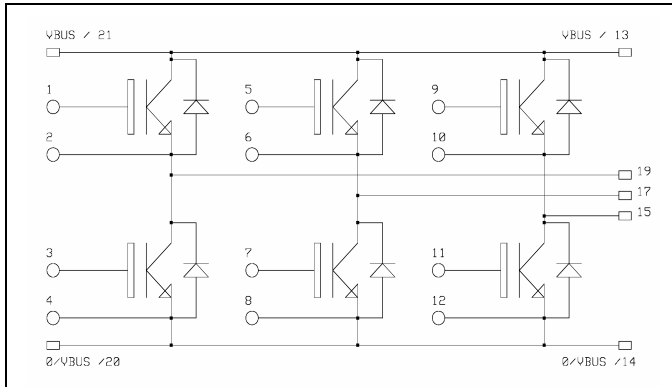


## 3 Phase bridge Trench IGBT® Power Module

$V_{CES} = 1200V$   
 $I_C = 75A @ T_c = 80^\circ C$



### Application

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

### 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

### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	100
		$T_C = 80^\circ C$	75
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	175
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	350
RBSOA	Reverse Bias Operating Area	$T_j = 125^\circ C$	150A@1100V

 **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	$V_{GE} = 0V, I_C = 5mA$	1200			V	
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$			5	mA	
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 75A$	$T_j = 25^\circ\text{C}$	1.4	1.7	2.1	V
			$T_j = 125^\circ\text{C}$		2.0		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3mA$	5.0		6.5	V	
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			500	nA	

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1MHz$		5340		pF
$C_{oes}$	Output Capacitance			280		
$C_{res}$	Reverse Transfer Capacitance			240		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 75A$ $R_G = 4.7\Omega$		260		ns
$T_r$	Rise Time			30		
$T_{d(off)}$	Turn-off Delay Time			420		
$T_f$	Fall Time			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 75A$ $R_G = 4.7\Omega$		285		ns
$T_r$	Rise Time			45		
$T_{d(off)}$	Turn-off Delay Time			520		
$T_f$	Fall Time			90		
$E_{off}$	Turn off Energy			9.5		mJ

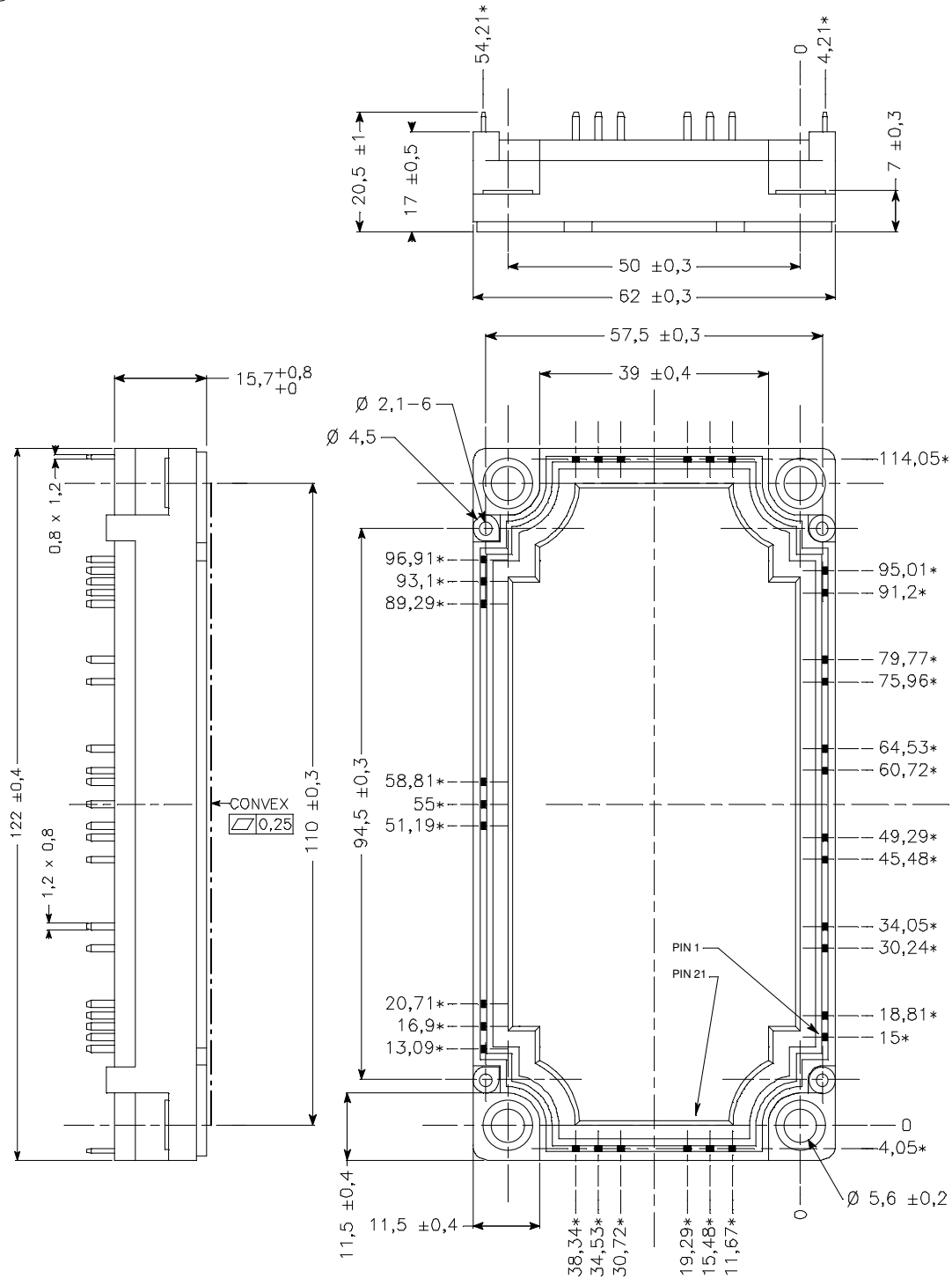
## Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$V_F$	Diode Forward Voltage	$I_F = 75A$ $V_{GE} = 0V$	$T_j = 25^\circ\text{C}$		1.6	2.1	V
			$T_j = 125^\circ\text{C}$		1.6		
$E_r$	Reverse Recovery Energy	$I_F = 75A$ $V_R = 600V$ $di/dt = 825A/\mu s$	$T_j = 25^\circ\text{C}$		3		mJ
			$T_j = 125^\circ\text{C}$		6		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 75A$ $V_R = 600V$ $di/dt = 825A/\mu s$	$T_j = 25^\circ\text{C}$		7.6		$\mu C$
			$T_j = 125^\circ\text{C}$		13.7		

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.35	$^\circ\text{C/W}$	
		Diode		0.58		
$V_{ISOL}$	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

**Package outline**



ALL DIMENSIONS MARKED "\*" ARE TOLERENCED AS:  $\varnothing 0,4$

**APT reserves the right to change, without notice, the specifications and information contained herein**

APT's products are covered by one or more of U.S patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S and Foreign patents pending. All Rights Reserved.