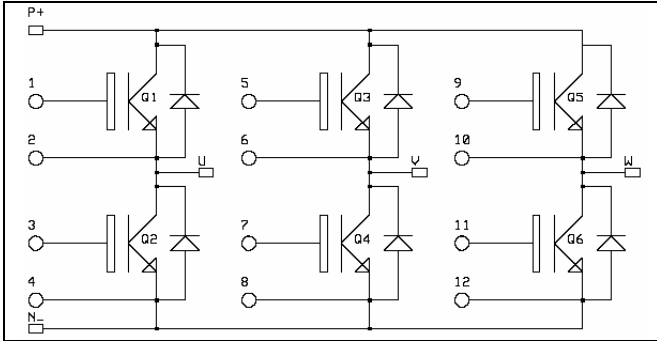


**3 Phase bridge  
NPT IGBT Power Module**

**$V_{CES} = 1200V$   
 $I_C = 50A @ T_c = 80^\circ C$**



**Application**

- AC Motor control

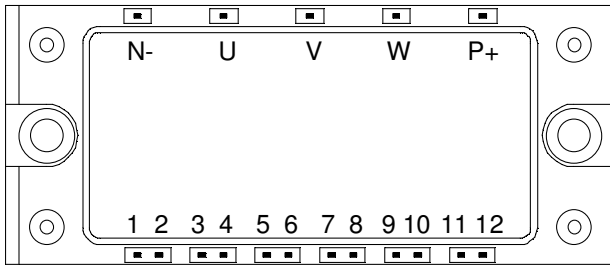
**Features**

- Non Punch Through (NPT) 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

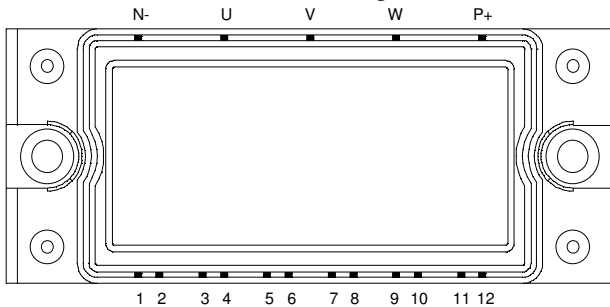
**Benefits**

- 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

**Pin out: APTGF50X120E2 (Long pins)**



**Pin out: APTGF50X120P2 (Short pins)**



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

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	72
		$T_C = 80^\circ C$	50
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	140
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	350
SCSOA	Short Circuit Safe Operating Area	$T_j = 125^\circ C$	500A@1200V

**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	$V_{GE} = 0V, I_C = 500\mu A$	1200			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 1200V$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	0.8 4	1	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 50A$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	2.5 3.1	3.0 3.7	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 2 mA$	4.5	5.5	6.5	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			200	nA

**Dynamic Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V$		3300		pF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		500		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		220		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ C$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 50A$ $R_G = 22\Omega$		44	100	ns
$T_r$	Rise Time			56	100	
$T_{d(off)}$	Turn-off Delay Time			380	500	
$T_f$	Fall Time			70	100	

**Reverse diode ratings and characteristics**

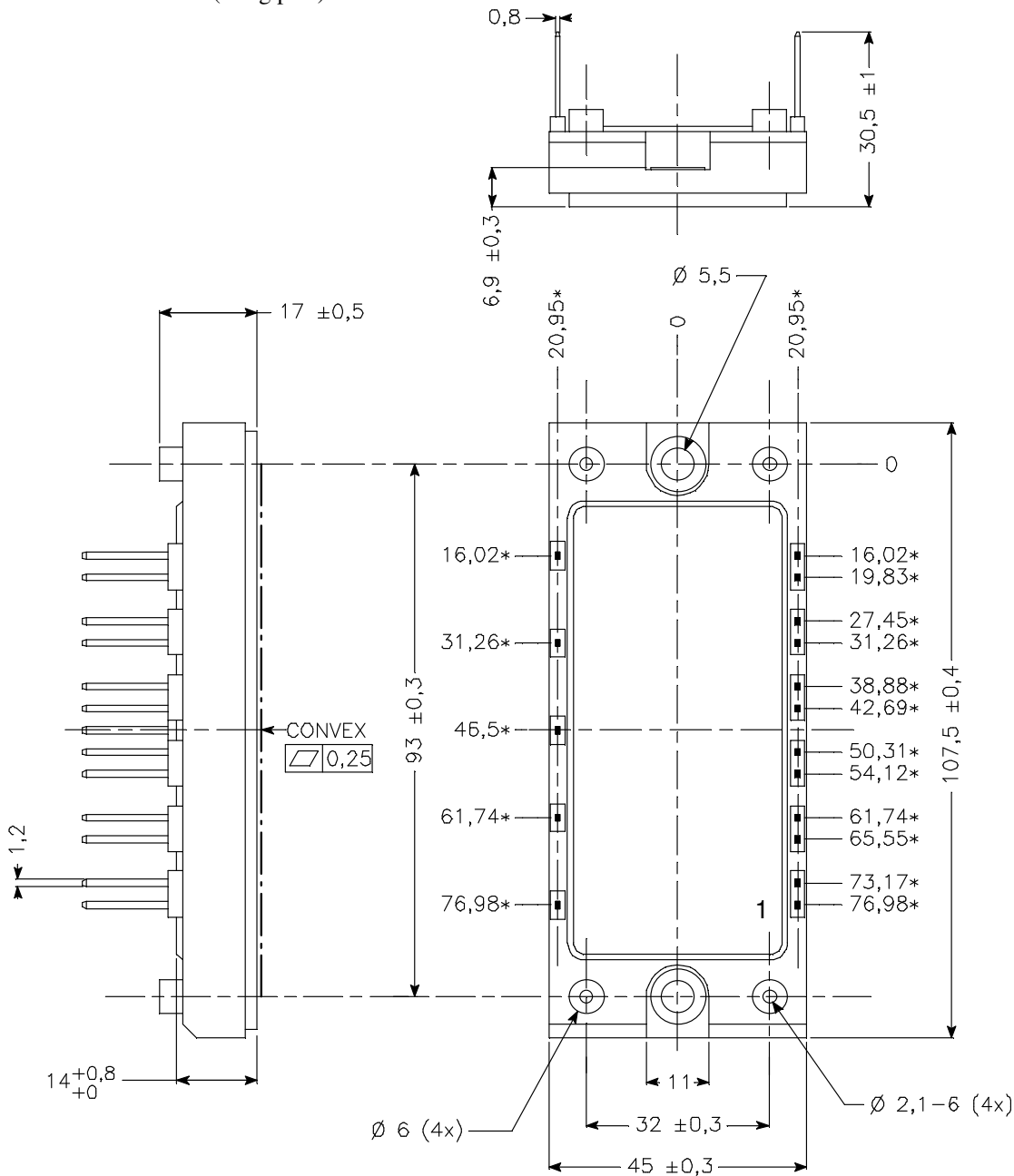
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 50A$ $V_{GE} = 0V$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	2.3 1.8	2.8	V
$t_{rr}$	Reverse Recovery Time	$I_F = 50A$ $V_R = 600V$ $di/dt = 800A/\mu s$	$T_j = 125^\circ C$	0.2		$\mu s$
$Q_{rr}$	Reverse Recovery Charge	$I_F = 50A$ $V_R = 600V$ $di/dt = 800A/\mu s$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	2.8 8		$\mu C$

**Thermal and package characteristics**

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.35	$^\circ C/W$	
		Diode		0.7		
$V_{ISOL}$	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	$^\circ C$	
$T_{STG}$	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

**Package outline**

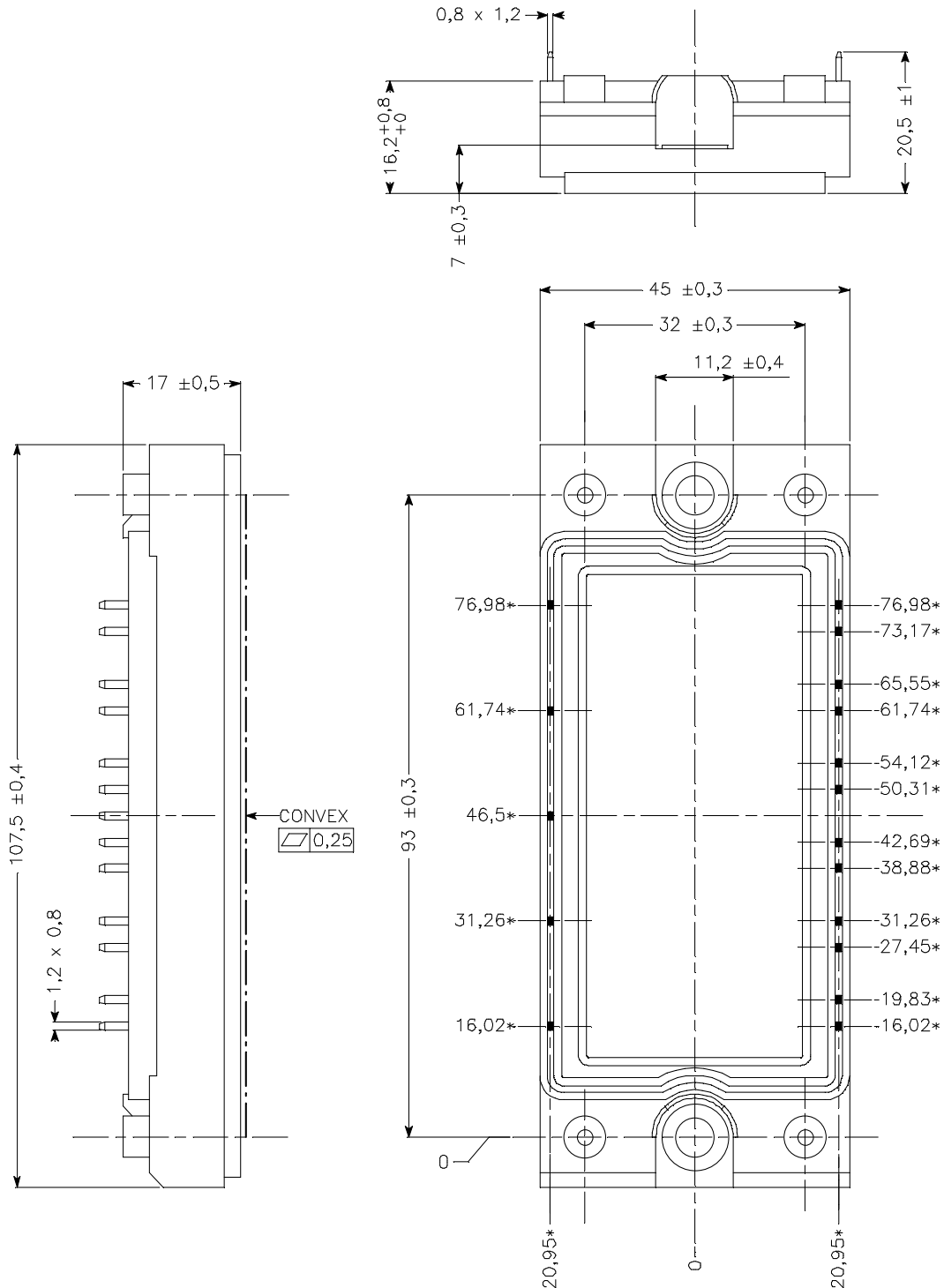
Pin out: APTGF50X120E2 (Long pins)



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

**Package outline**

Pin out: APTGF50X120P2 (Short pins)



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

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