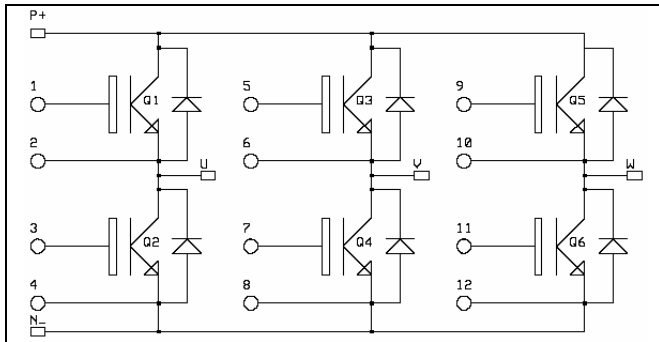


**3 Phase bridge
NPT IGBT Power Module**

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



Application

- AC Motor control

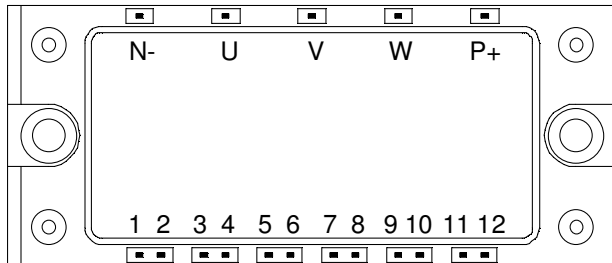
Features

- 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

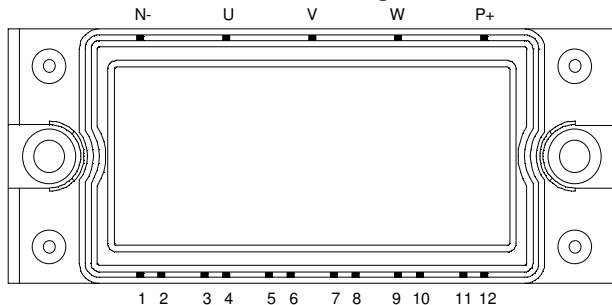
Benefits

- 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	± 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

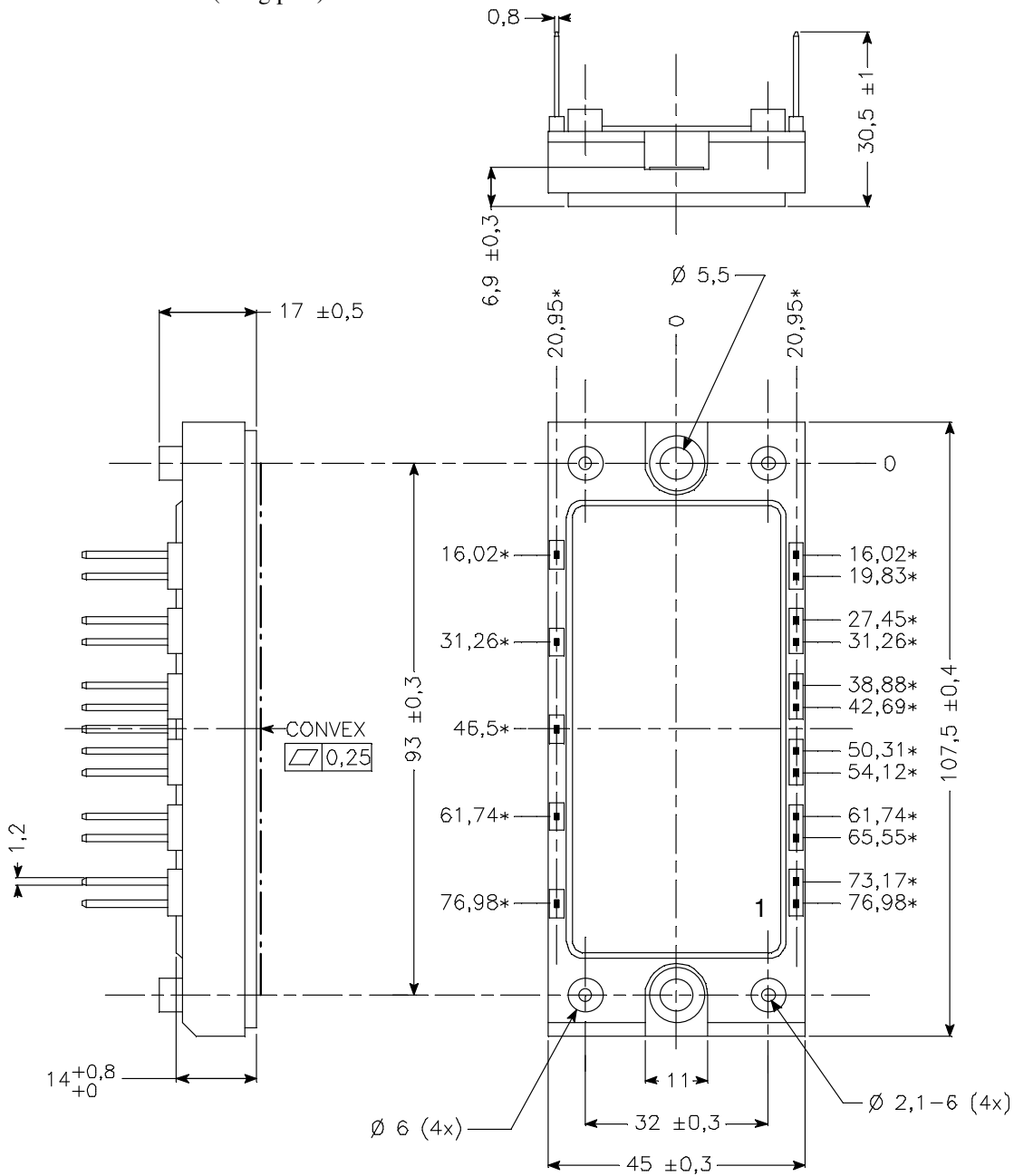
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_F	Diode Forward Voltage	$I_F = 50A$ $V_{GE} = 0V$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	2.3 1.8	2.8	V
t_{rr}	Reverse Recovery Time	$I_F = 50A$ $V_R = 600V$ $di/dt = 800A/\mu s$	$T_j = 125^\circ C$	0.2		μs
Q_{rr}	Reverse Recovery Charge	$I_F =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

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

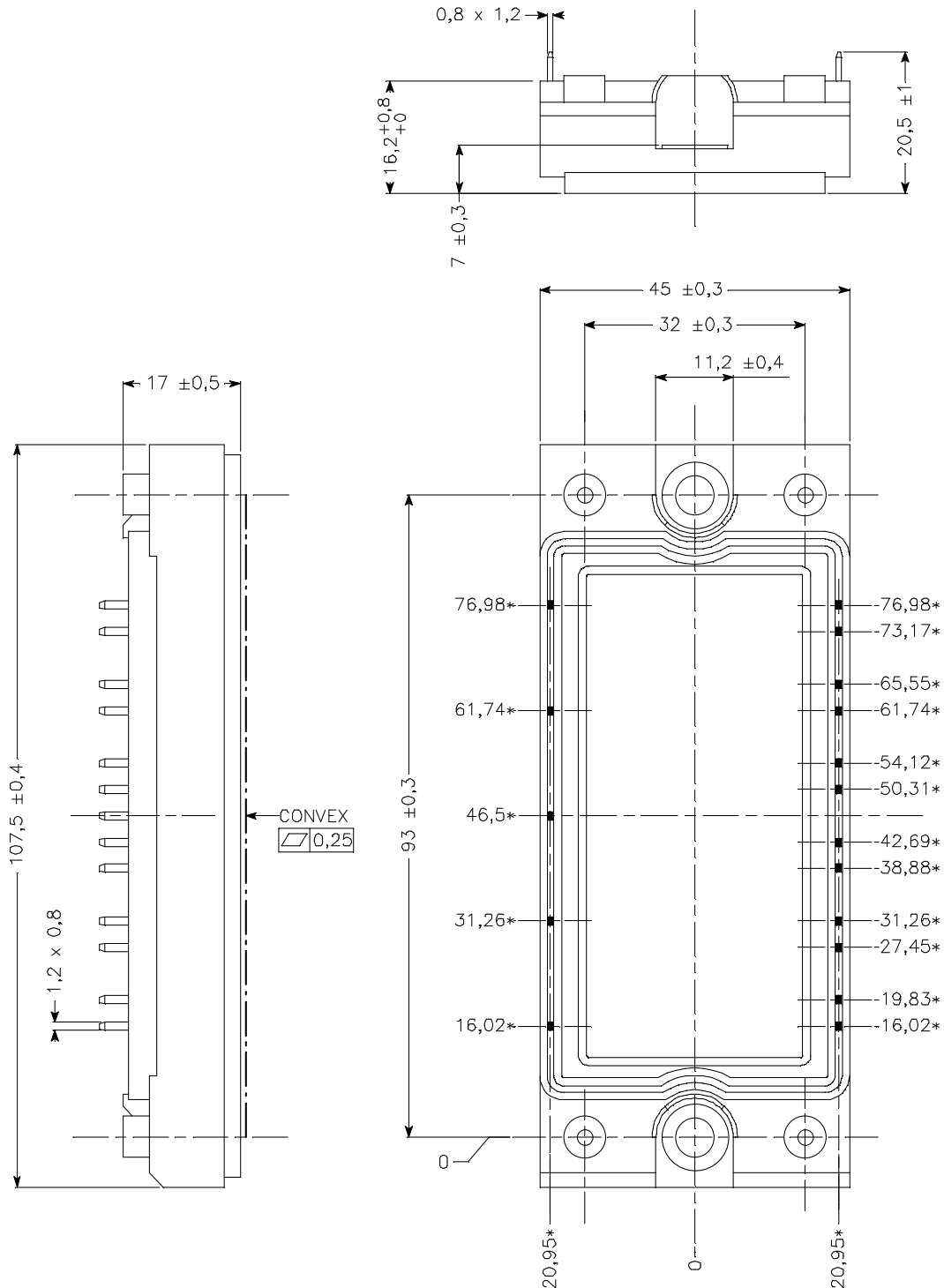
Pin out: APTGF50X120E2 (Long pins)



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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