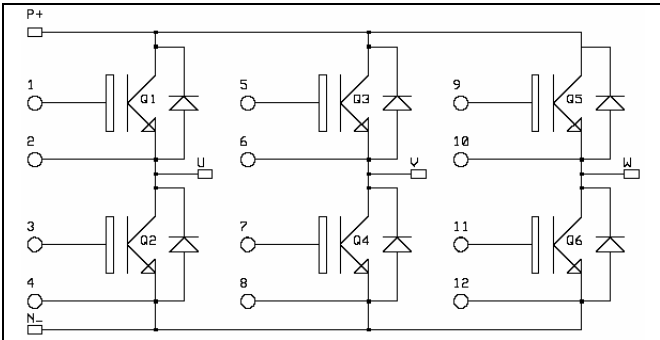


3 Phase bridge NPT IGBT Power Module

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



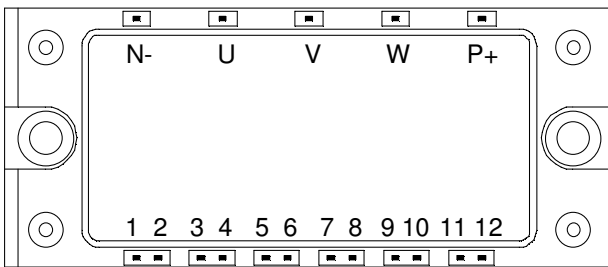
Application

- AC Motor control

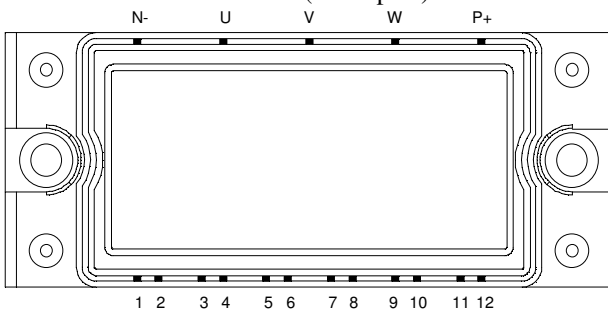
Features

- 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

Pin out: APTGF50X120E2 (Long pins)



Pin out: APTGF50X120P2 (Short 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	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

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
BV _{CES}	Collector - Emitter Breakdown Voltage	V _{GE} = 0V, I _C = 500μA	1200			V
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} = 0V V _{CE} = 1200V		T _J = 25°C 0.8 T _J = 125°C 4	1	mA
V _{CE(on)}	Collector Emitter on Voltage	V _{GE} = 15V I _C = 50A		T _J = 25°C 2.5 T _J = 125°C 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

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
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°C) V _{GE} = ±15V V _{Bus} = 600V I _C = 50A R _G = 22Ω		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

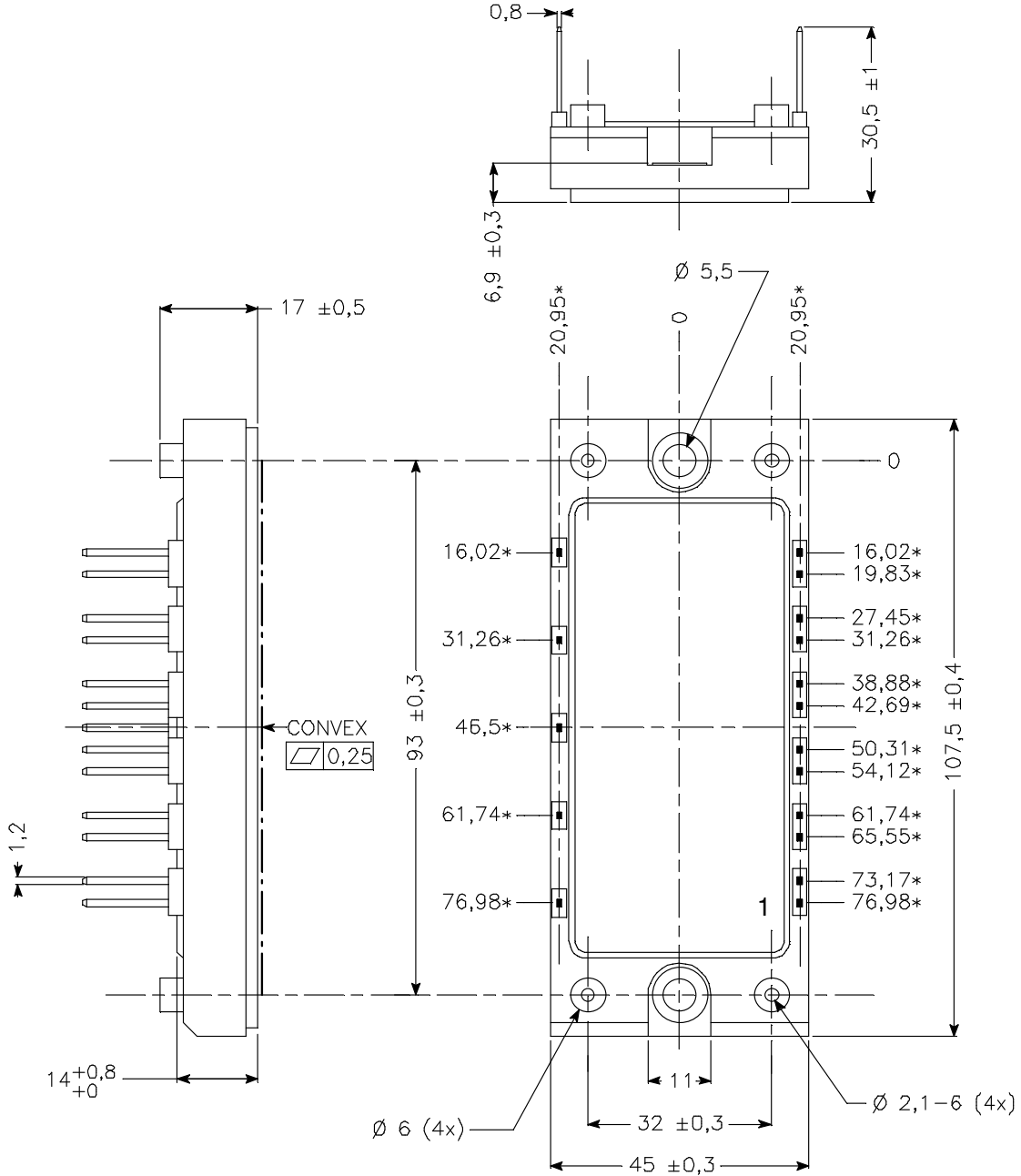
<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
V _F	Diode Forward Voltage	I _F = 50A V _{GE} = 0V		T _J = 25°C 2.3 T _J = 125°C 1.8	2.8	V
t _{rr}	Reverse Recovery Time	I _F = 50A V _R = 600V di/dt = 800A/μs		T _J = 125°C 0.2		μs
Q _{rr}	Reverse Recovery Charge	I _F = 50A V _R = 600V di/dt = 800A/μs		T _J = 25°C 2.8 T _J = 125°C 8		μC

Thermal and package characteristics

<i>Symbol</i>	<i>Characteristic</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	
R _{thJC}	Junction to Case	IGBT			0.35	°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	°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

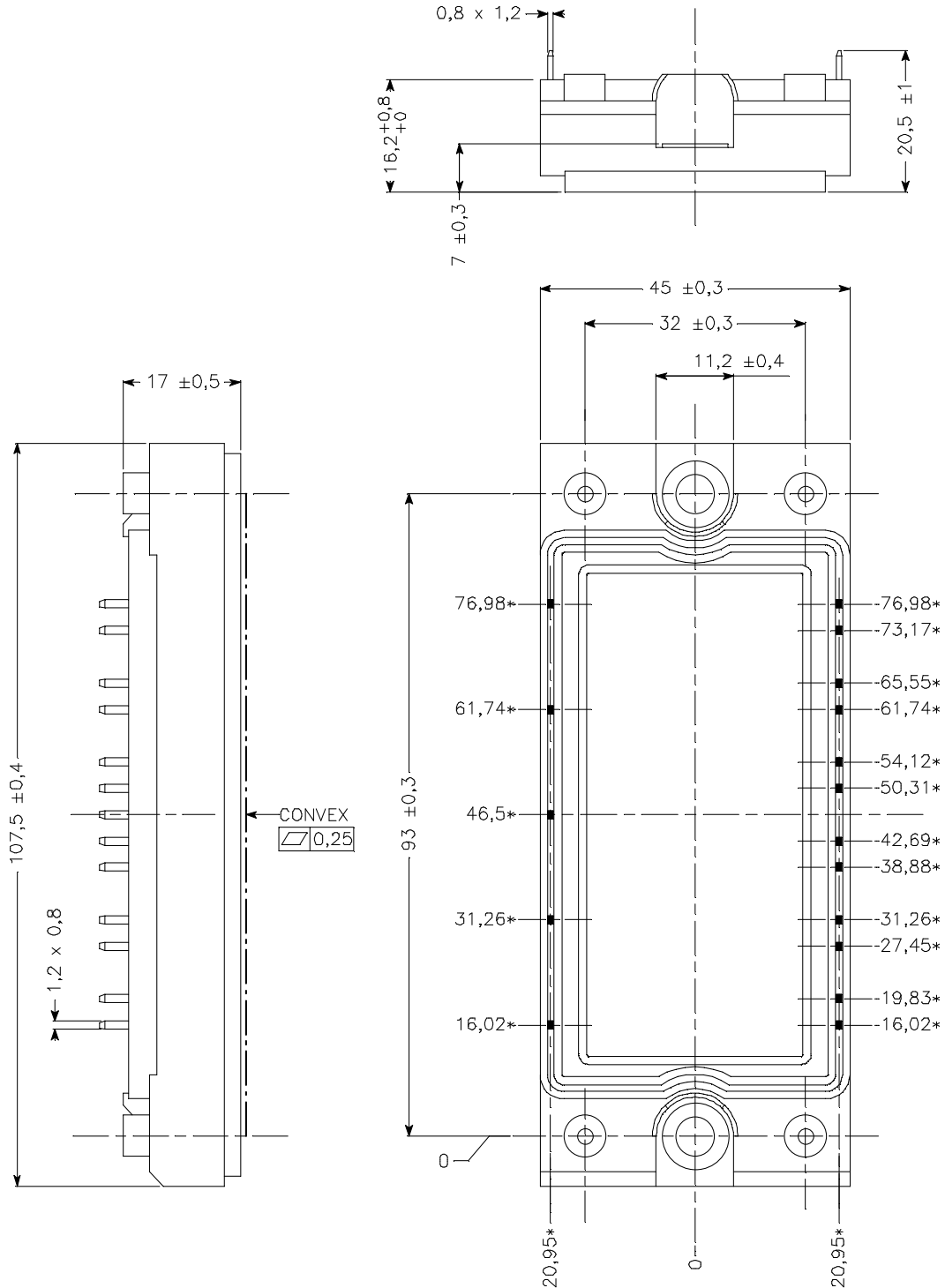
Pin out: APTGF50X120E2 (Long pins)



ALL DIMENSIONS MARKED "*" ARE TOLERANCED 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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