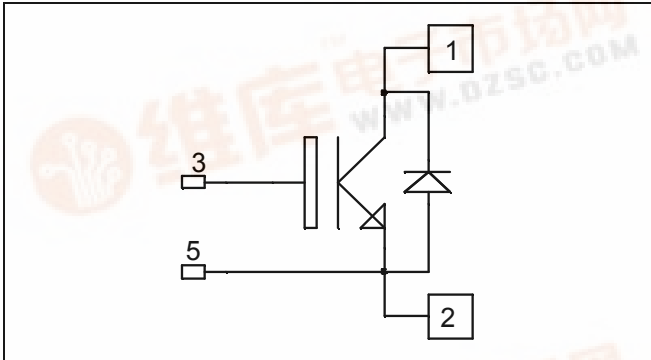


APTGF660U60D4

Single switch NPT IGBT Power Module

$V_{CES} = 600V$
 $I_C = 660A @ T_c = 80^\circ C$

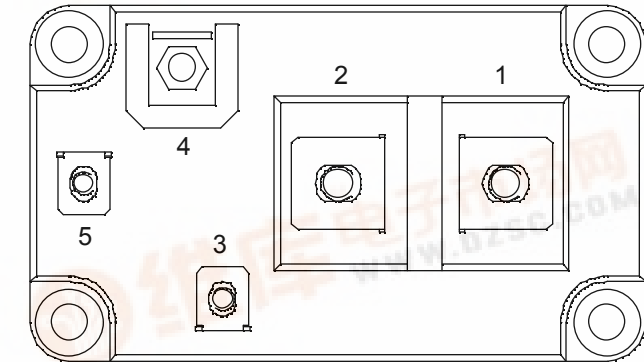


Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Non Punch Through (NPT) fast IGBT
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 50 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - Avalanche energy rated
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Low stray inductance
 - M6 connectors for power
 - M4 connectors for signal
- High level of integration



Benefits

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	600	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$	825
		$T_C = 80^\circ C$	660
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	1100
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	2770
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	1100A@520V

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} = 0V	T _j = 25°C		1	500	μA
		V _{CE} = 600V	T _j = 125°C		1		mA
V _{CE(on)}	Collector Emitter on Voltage	V _{GE} = 15V	T _j = 25°C		1.95	2.45	V
		I _C = 660A	T _j = 125°C		2.2		
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 6mA		4.5	5.5	6.5	V
I _{GES}	Gate – Emitter Leakage Current	V _{GE} = 20V, V _{CE} = 0V				400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
C _{ies}	Input Capacitance	V _{GE} = 0V, V _{CE} = 25V f = 1MHz		36		nF	
C _{res}	Reverse Transfer Capacitance			3.2			
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 800A R _G = 4.7Ω		210		ns	
T _r	Rise Time			86			
T _{d(off)}	Turn-off Delay Time			420			
T _f	Fall Time			83			
T _{d(on)}	Turn-on Delay Time	Inductive Switching (125°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 800A R _G = 4.7Ω		250		ns	
T _r	Rise Time			93			
T _{d(off)}	Turn-off Delay Time			450			
T _f	Fall Time			95			
E _{on}	Turn on Energy			18			mJ
E _{off}	Turn off Energy			25			

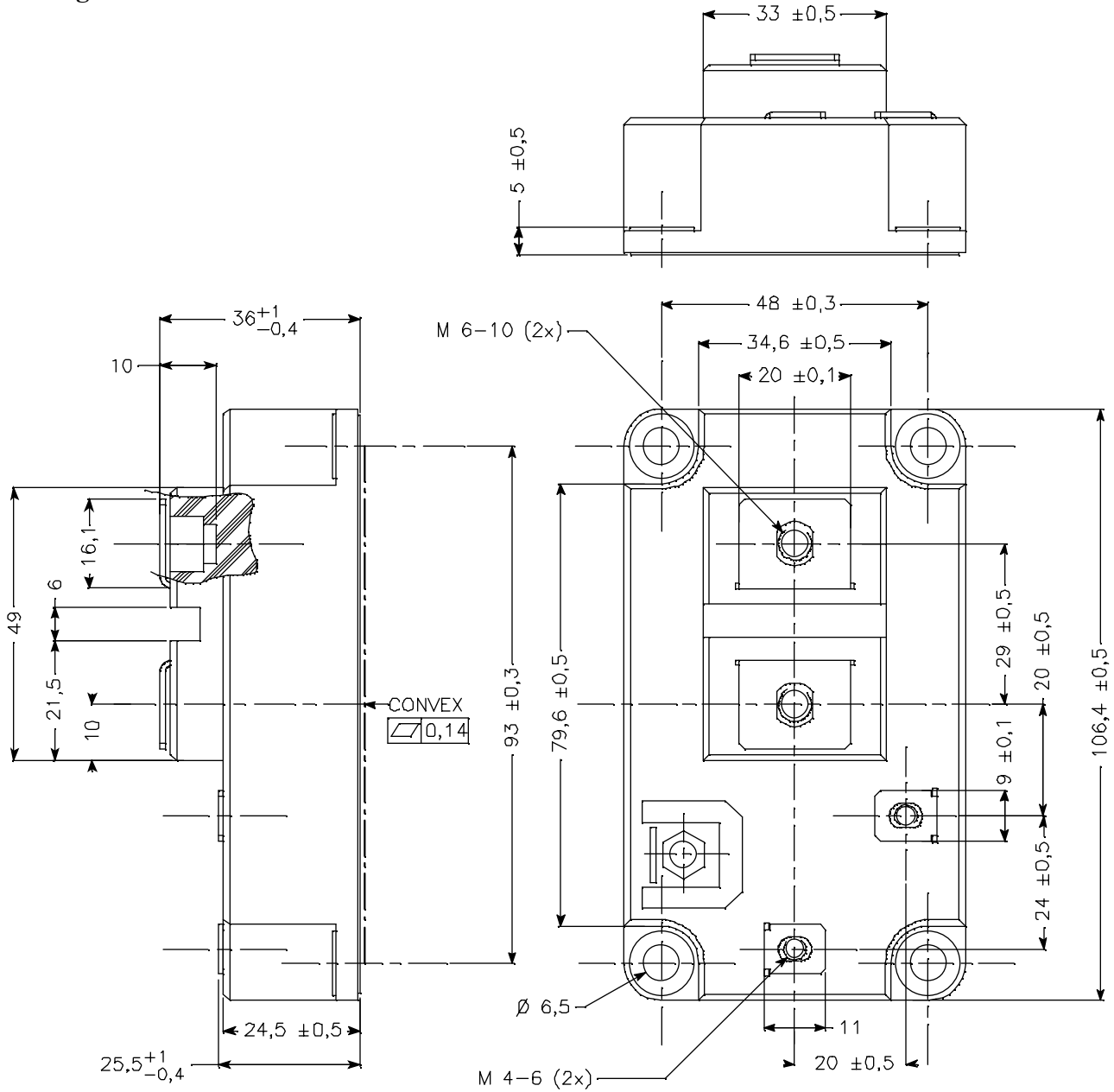
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
V _F	Diode Forward Voltage	I _F = 800A	T _j = 25°C		1.25	1.6	V
		V _{GE} = 0V	T _j = 125°C		1.2		
Q _{rr}	Reverse Recovery Charge	I _F = 800A V _R = 300V di/dt = 4000A/μs	T _j = 25°C		52		μC
			T _j = 125°C		87		

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit
R _{thJC}	Junction to Case	IGBT		0.045	°C/W
		Diode		0.085	
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	M6	3	5	N.m
		M4	1	2	
Wt	Package Weight			420	g

Package outline



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.