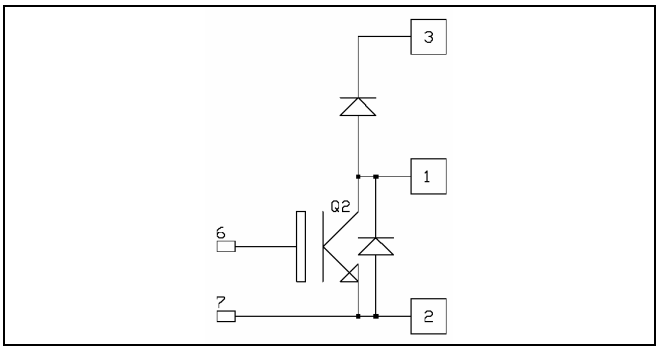
APTGF165DA60D1

Boost Chopper
NPT IGBT Power Module

V_{CES} = 600V
I_C = 165A @ Tc = 80°C

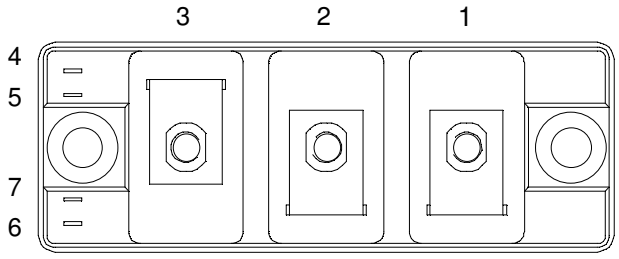


Application

- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction

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
  - M5 power connectors
- 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°C	230	A
		T_C = 80°C	165	
I_{CM}	Pulsed Collector Current	T_C = 25°C	400	
V_{GE}	Gate – Emitter Voltage		±20	V
P_D	Maximum Power Dissipation	T_C = 25°C	730	W
RBSOA	Reverse Bias Safe Operation Area	T_j = 125°C	400A@420V	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handing Procedures Should Be Followed.

Electrical Characteristics

All ratings @ T_j = 25°C unless otherwise specified

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
BV_{CES}	Collector - Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 5 mA		600			V
I_{CES}	Zero Gate Voltage Collector Current	V_{GE} = 0V V_{CE} = 600V	T_j = 25°C		1	500	µA
			T_j = 125°C		1		mA
$V_{CE(on)}$	Collector Emitter on Voltage	V_{GE} = 15V I_C = 200A	T_j = 25°C		2.0	2.5	V
			T_j = 125°C		2.2		
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE} = V_{CE} , I_C = 4 mA		4.5		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		9000		pF
C_{res}	Reverse Transfer Capacitance			800		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) V_{GE} = ±15V V_{Bus} = 300V I_C = 200A R_G = 1.5Ω		165		ns
T_r	Rise Time			40		
$T_{d(off)}$	Turn-off Delay Time			250		
T_f	Fall Time			35		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) V_{GE} = ±15V V_{Bus} = 300V I_C = 200A R_G = 1.5Ω		180		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			285		
T_f	Fall Time			40		
E_{off}	Turn off energy			6.3		mJ

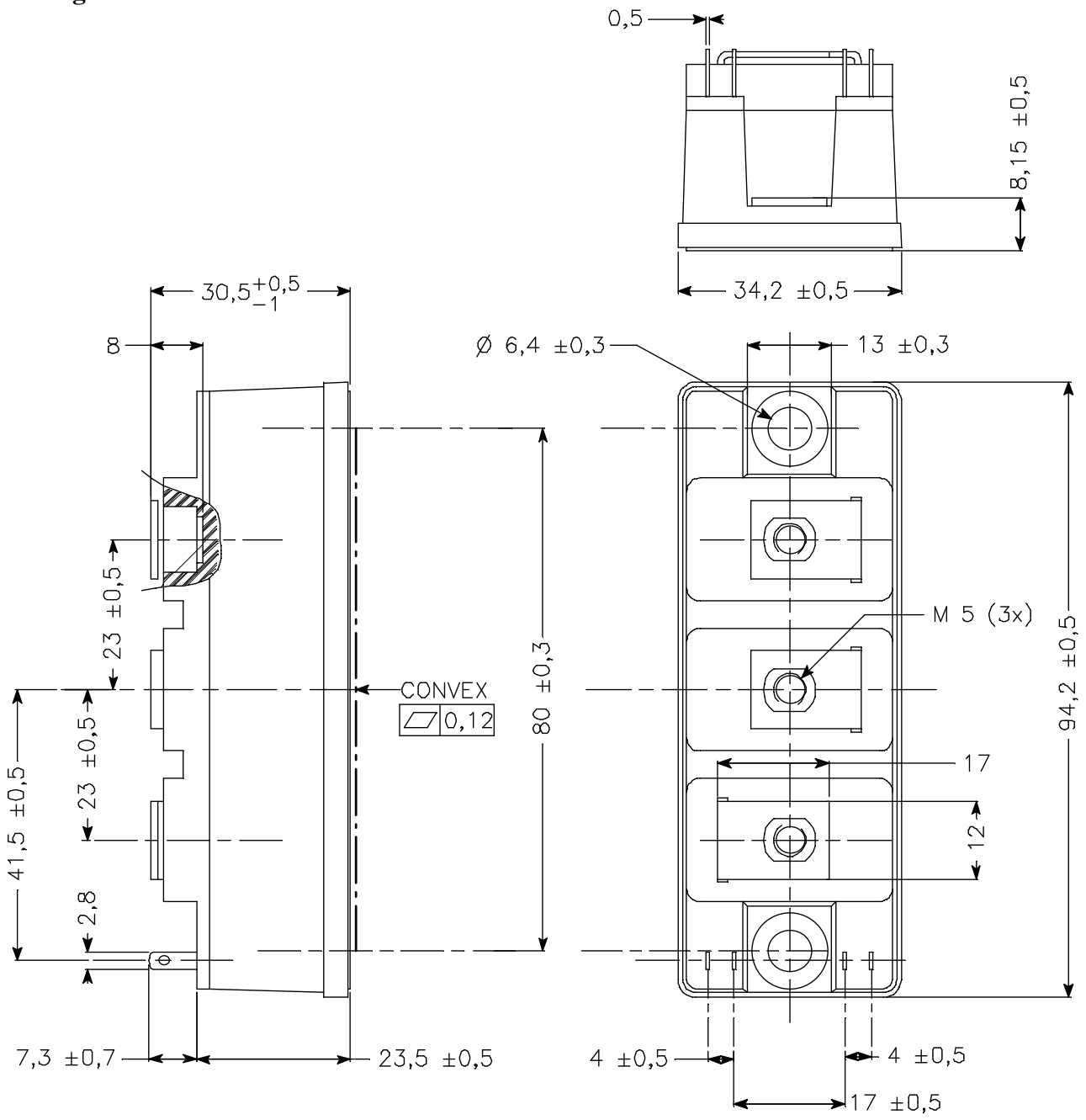
Reverse diode ratings and characteristics

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
V_F	Diode Forward Voltage	I_F = 200A V_{GE} = 0V	T_j = 25°C		1.25	1.6	V
			T_j = 125°C		1.2		
E_r	Reverse Recovery Energy	I_F = 200A V_R = 300V di/dt =900A/µs	T_j = 125°C		4.1		mJ
Q_{rr}	Reverse Recovery Charge	I_F = 200A V_R = 300V di/dt =900A/µs	T_j = 25°C		12		µC
			T_j = 125°C		19		

Thermal and package characteristics

Symbol	*Characteristic*			*Min*	*Typ*	*Max*	*Unit*
R_{thJC}	Junction to Case		IGBT			0.17	°C/W
			Diode			0.29	
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	For terminals	M5	2		3.5	N.m
		To Heatsink	M6	3		5	
Wt	Package Weight					180	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.