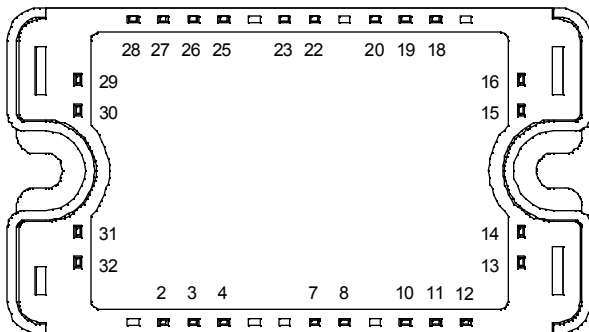
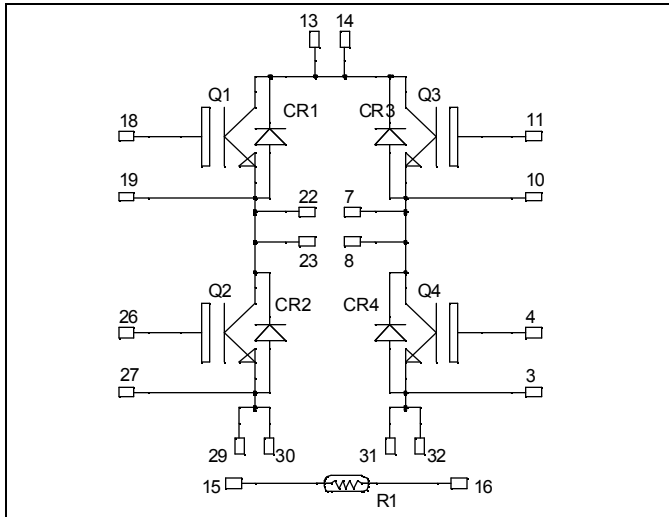


Full - Bridge PT IGBT Power Module

**$V_{CES} = 1200V$
 $I_C = 30A @ T_c = 80^\circ C$**



All multiple inputs and outputs must be shorted together
Example: 13/14 ; 29/30 ; 22/23 ...

Application

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

Features

- Power MOS 7[®] Punch Through (PT) IGBT
 - Low conduction loss
 - Ultra fast tail current shutoff
 - Low gate charge
 - Switching frequency capability in the 200kHz range
 - Soft recovery parallel diodes
 - Low diode VF
- Kelvin emitter for easy drive
- Very low stray inductance
 - Symmetrical design
- Internal thermistor for temperature monitoring
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- Each leg can be easily paralleled to achieve a phase leg of twice the current capability

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	1200	V
I_C	Continuous Collector Current	$T_c = 25^\circ C$	A
		$T_c = 80^\circ C$	
I_{CM}	Pulsed Collector Current	$T_c = 25^\circ C$	105
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	208
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	105A @ 960V

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

All ratings @ T_j = 25°C unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV _{CES}	Collector - Emitter Breakdown Voltage	V _{GE} = 0V, I _C = 250μA	1200			V
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} = 0V V _{CE} = 1200V			250 2500	μA
V _{CE(on)}	Collector Emitter on Voltage	V _{GE} = 15V I _C = 30A		3.3 3.0	3.9	V
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 1 mA	3		6	V
I _{GES}	Gate - Emitter Leakage Current	V _{GE} = ±20V, V _{CE} = 0V			±100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{ies}	Input Capacitance	V _{GE} = 0V		3240		pF
C _{oes}	Output Capacitance	V _{CE} = 25V		248		
C _{res}	Reverse Transfer Capacitance	f = 1MHz		31		
Q _g	Total gate charge	V _{GE} = 15V		150		nC
Q _{ge}	Gate - Emitter Charge	V _{Bus} = 600V		21		
Q _{gc}	Gate - Collector Charge	I _C = 30A		62		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C) V _{GE} = 15V V _{Bus} = 600V I _C = 30A R _G = 5Ω		16		ns
T _r	Rise Time			20		
T _{d(off)}	Turn-off Delay Time			94		
T _f	Fall Time			40		
E _{on1}	Turn-on Switching Energy			750		μJ
E _{on2}	Turn-on Switching Energy ❶			1305		
E _{off}	Turn-off Switching Energy ❷			680		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (125°C) V _{GE} = 15V V _{Bus} = 600V I _C = 30A R _G = 5Ω		16		ns
T _r	Rise Time			20		
T _{d(off)}	Turn-off Delay Time			147		
T _f	Fall Time			75		
E _{on1}	Turn-on Switching Energy			750		μJ
E _{on2}	Turn-on Switching Energy ❶			2132		
E _{off}	Turn-off Switching Energy ❷			1744		

❶ E_{on2} includes diode reverse recovery

❷ In accordance with JEDEC standard JESD24-1

Temperature sensor NTC

Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		68		kΩ
B _{25/85}	T ₂₅ = 298.16 K		4080		K

$$R_T = \frac{R_{25}}{\exp \left[B_{25/85} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

T: Thermistor temperature

R_T: Thermistor value at T

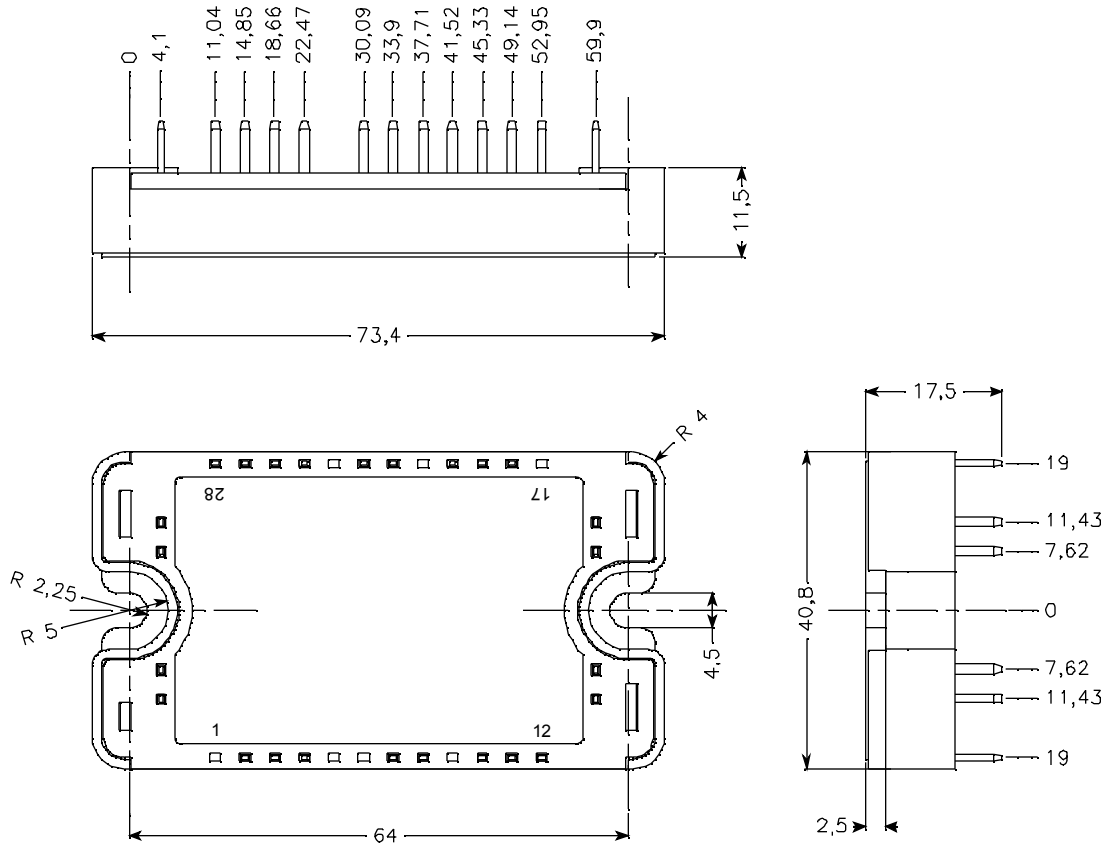
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			1200			V
I_{RM}	Maximum Reverse Leakage Current	$V_R=1200V$	$T_j = 25^\circ C$			250	μA
			$T_j = 125^\circ C$			500	
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle	$T_c = 80^\circ C$		25		A
V_F	Diode Forward Voltage	$I_F = 25A$ $V_{GE} = 0V$	$T_j = 25^\circ C$		2.3	2.8	V
			$T_j = 125^\circ C$		1.8		
t_{rr}	Reverse Recovery Time	$I_F = 25A$	$T_j = 125^\circ C$		0.13		μs
Q_{rr}	Reverse Recovery Charge	$V_R = 600V$ $di/dt = 800A/\mu s$	$T_j = 25^\circ C$		2.3		μC
			$T_j = 125^\circ C$		6		

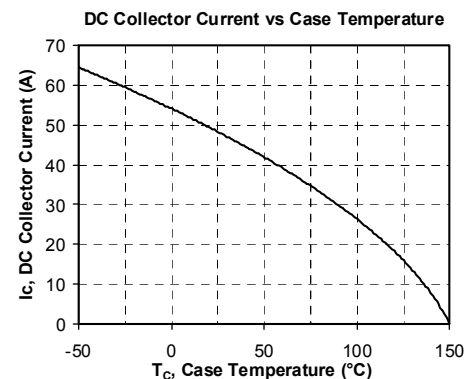
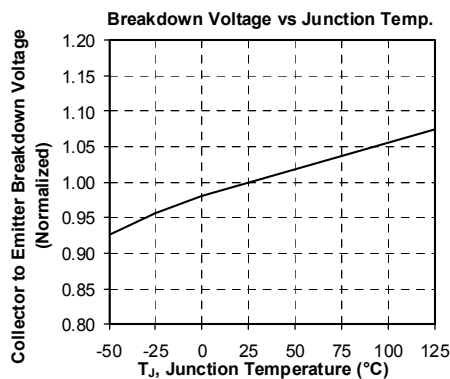
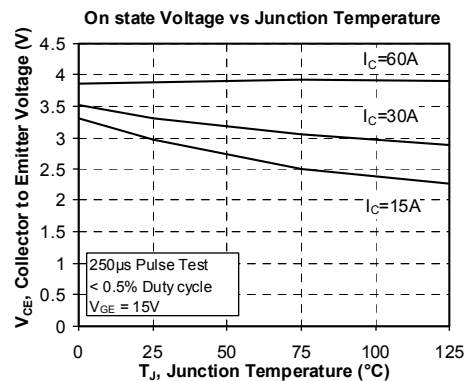
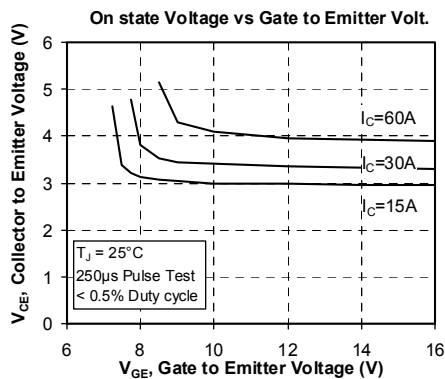
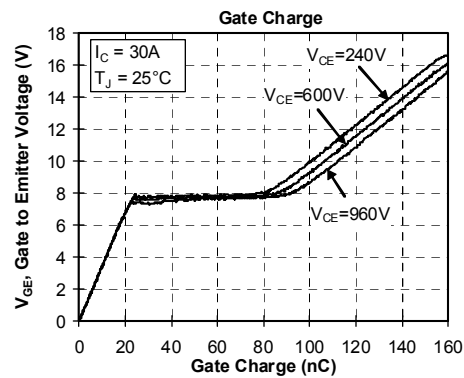
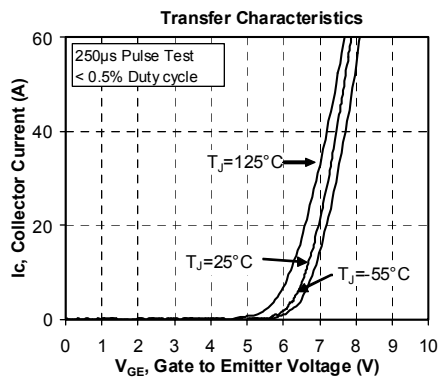
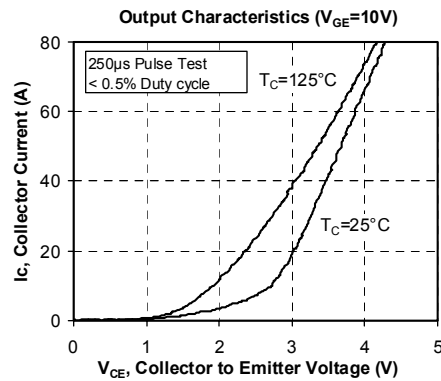
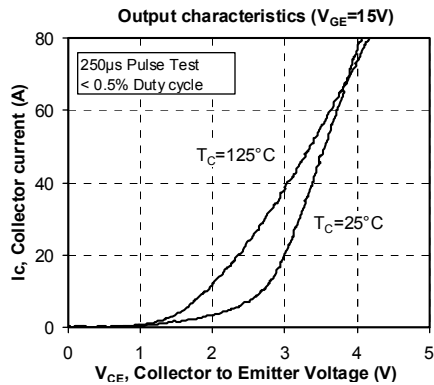
Thermal and package characteristics

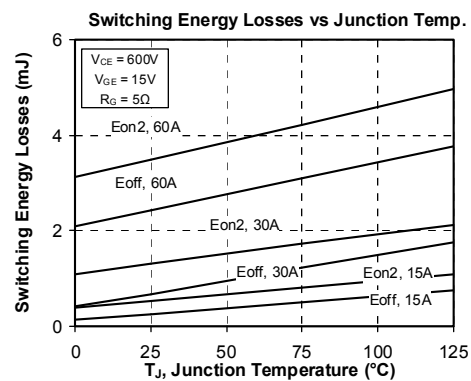
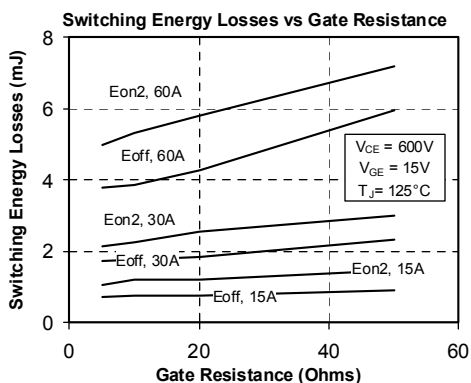
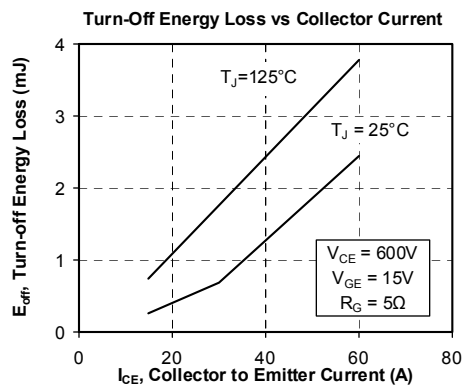
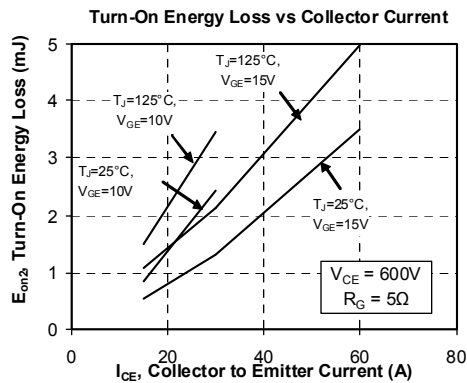
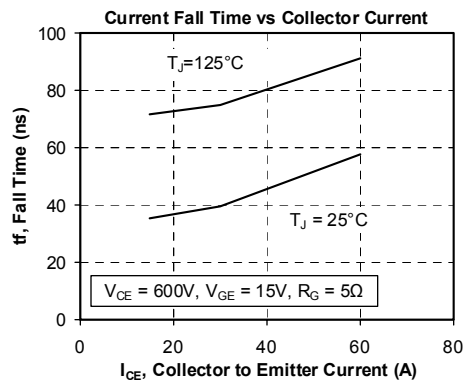
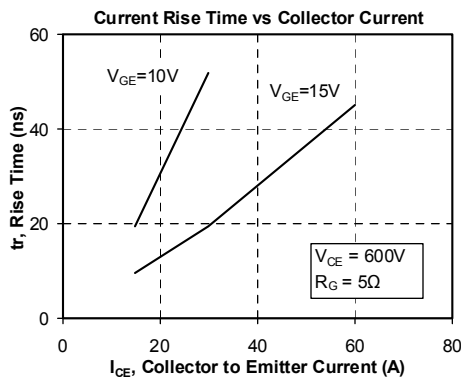
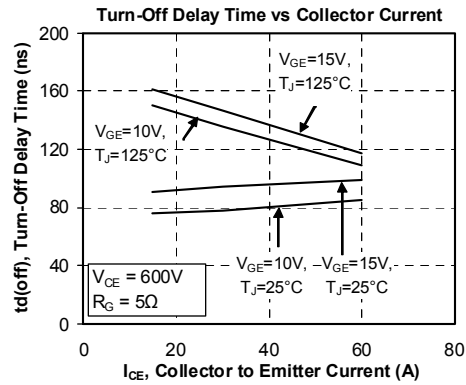
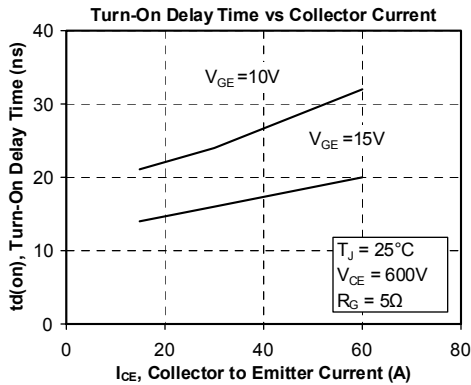
Symbol	Characteristic			Min	Typ	Max	Unit
R_{thJC}	Junction to Case	IGBT				0.6	$^\circ C/W$
		Diode				1	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1 \text{ min}$, $I_{isol} < 1mA$, 50/60Hz			2500			V
T_J	Operating junction temperature range			-40		150	$^\circ C$
T_{STG}	Storage Temperature Range			-40		125	
T_C	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsink	M4			4.7	N.m
Wt	Package Weight					110	g

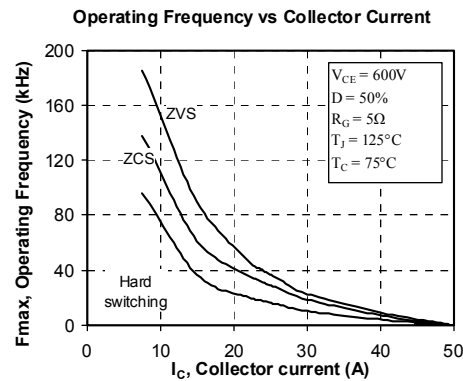
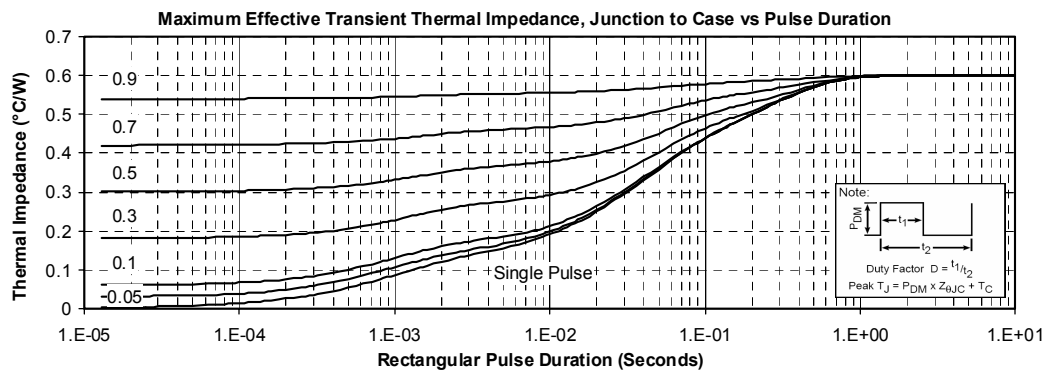
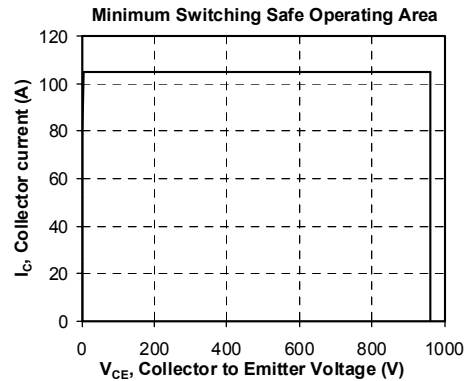
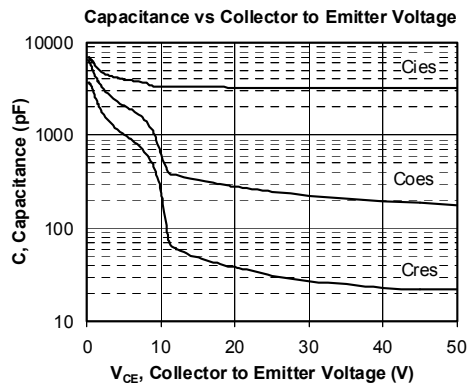
Package outline



Typical Performance Curve







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.