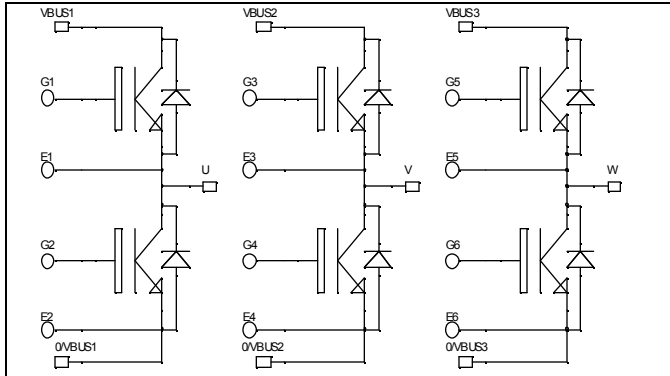


Triple phase leg PT IGBT Power Module

$$V_{CES} = 600V$$

$$I_C = 50A @ T_c = 80^{\circ}C$$

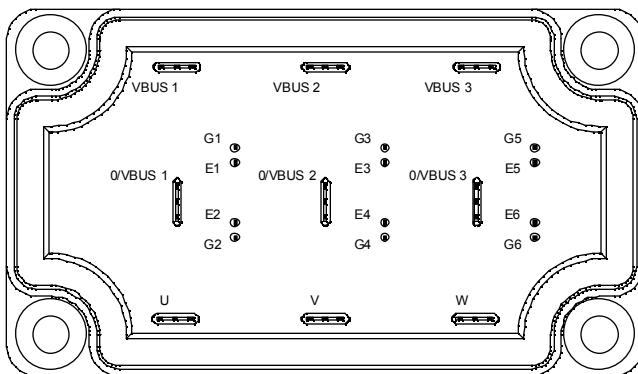


Application

- 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
 - Lead frames for power connections
- 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
- Very low (12mm) profile
- Each leg can be easily paralleled to achieve a phase leg of three times the current capability
- Module can be configured as a three phase bridge
- Module can be configured as a boost followed by a full bridge

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	600	V
I_C	Continuous Collector Current	$T_c = 25^{\circ}C$	A
		$T_c = 80^{\circ}C$	
I_{CM}	Pulsed Collector Current	$T_c = 25^{\circ}C$	200
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_c = 25^{\circ}C$	227
SSOA	Switching Safe Operating Area	$T_j = 150^{\circ}C$	190A @ 600V

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

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{CES}	Collector - Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 500\mu A$	600			V
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 600V$			500 2500	μA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 50A$		2.2 2.1	2.7	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 1mA$	3		6	V
I_{GES}	Gate - Emitter Leakage Current	$V_{GE} = \pm 20V, V_{CE} = 0V$			± 100	nA

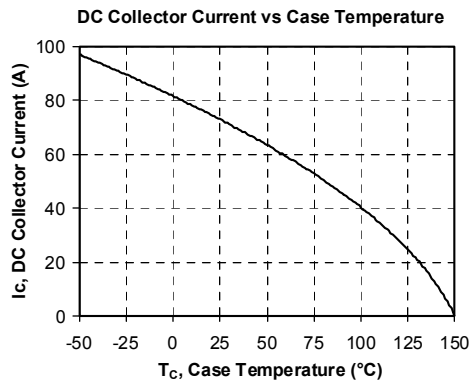
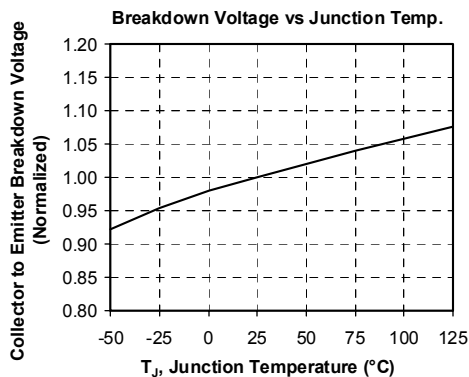
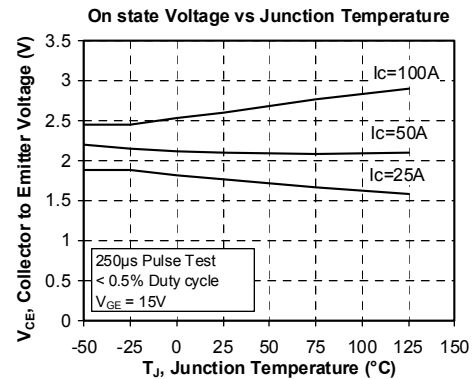
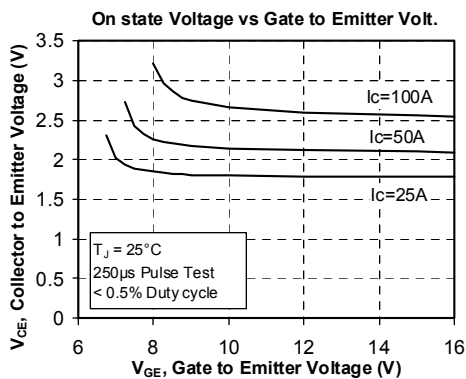
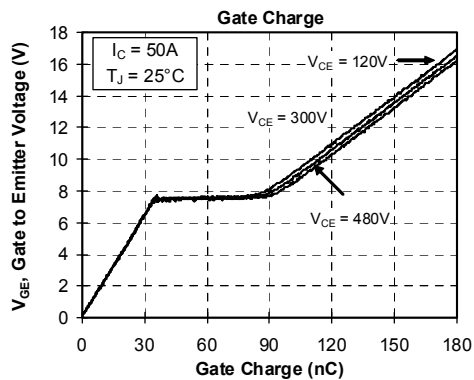
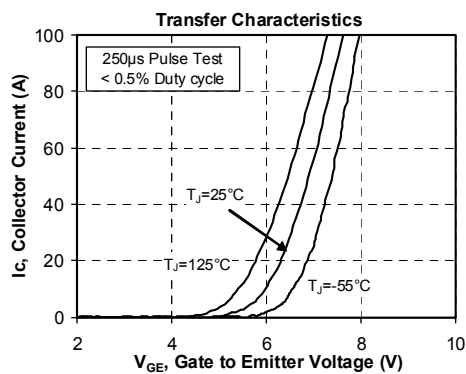
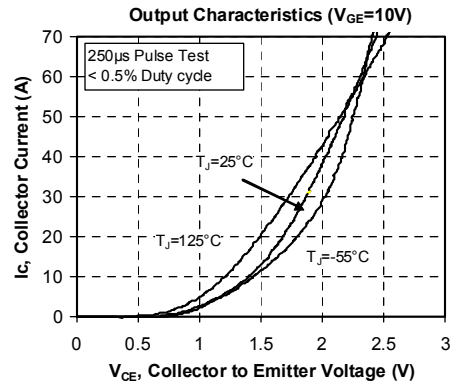
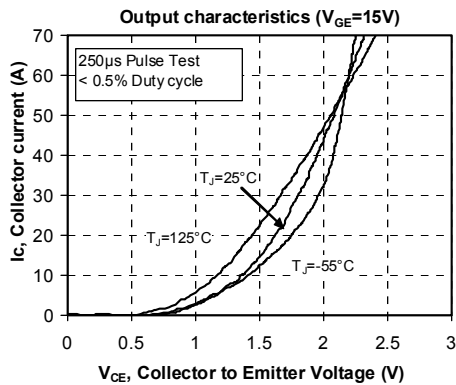
Dynamic Characteristics

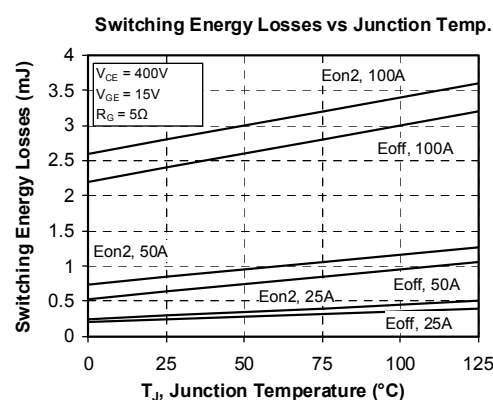
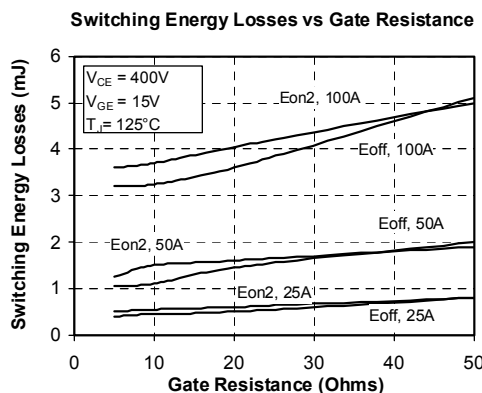
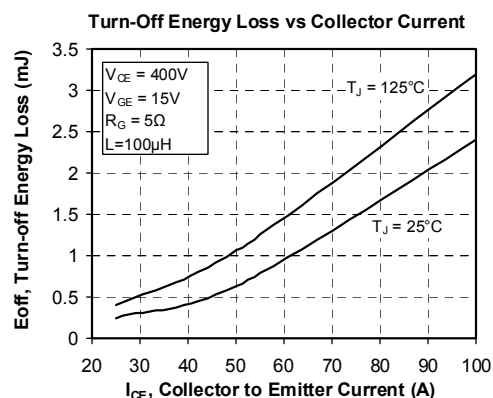
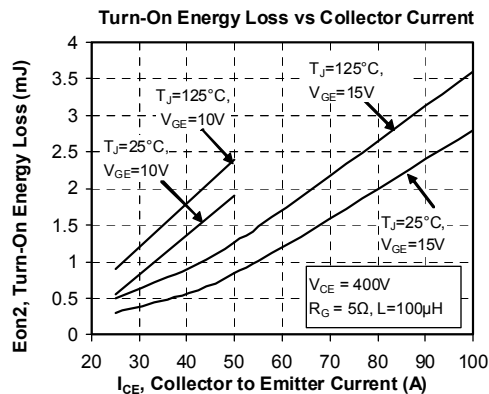
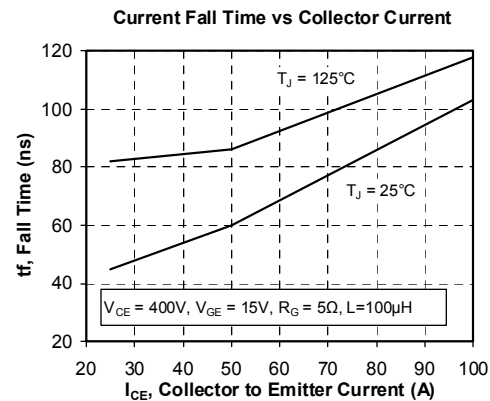
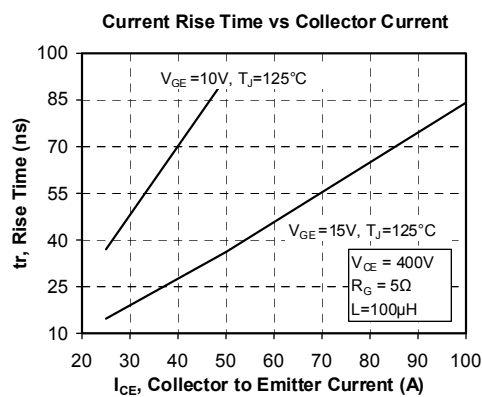
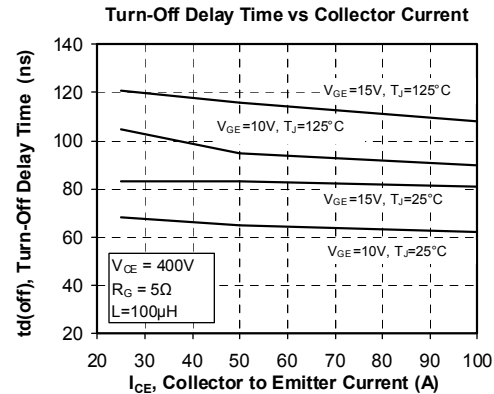
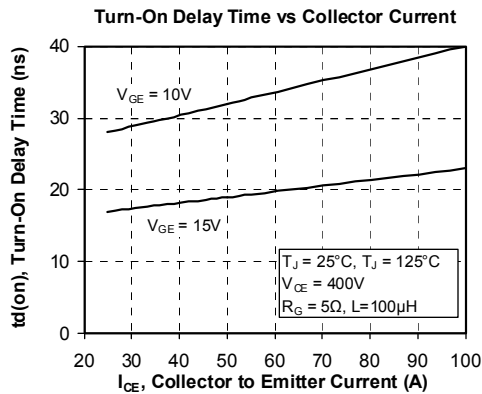
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V$		5700		pF
C_{oes}	Output Capacitance	$V_{CE} = 25V$		465		
C_{res}	Reverse Transfer Capacitance	$f = 1MHz$		30		
Q_g	Total gate Charge	$V_{GE} = 15V$		165		nC
Q_{ge}	Gate - Emitter Charge	$V_{Bus} = 300V$		40		
Q_{gc}	Gate - Collector Charge	$I_C = 50A$		50		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = 15V$ $V_{Bus} = 400V$ $I_C = 50A$ $R_G = 5\Omega$		19		ns
T_r	Rise Time			36		
$T_{d(off)}$	Turn-off Delay Time			83		
T_f	Fall Time			60		
E_{on1}	Turn-on Switching Energy			465		μJ
E_{on2}	Turn-on Switching Energy ❶			837		
E_{off}	Turn-off Switching Energy ❷			637		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = 15V$ $V_{Bus} = 400V$ $I_C = 50A$ $R_G = 5\Omega$		19		ns
T_r	Rise Time			36		
$T_{d(off)}$	Turn-off Delay Time			116		
T_f	Fall Time			86		
E_{on1}	Turn-on Switching Energy			465		μJ
E_{on2}	Turn-on Switching Energy ❶			1261		
E_{off}	Turn-off Switching Energy ❷			1058		

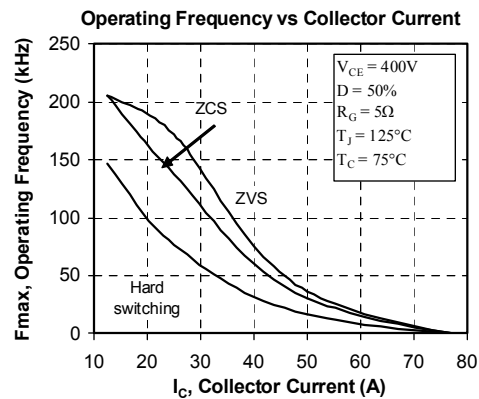
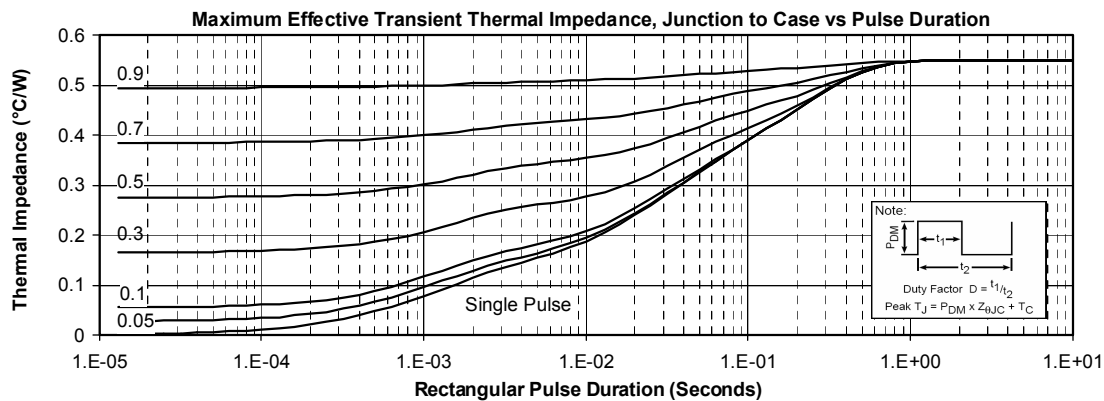
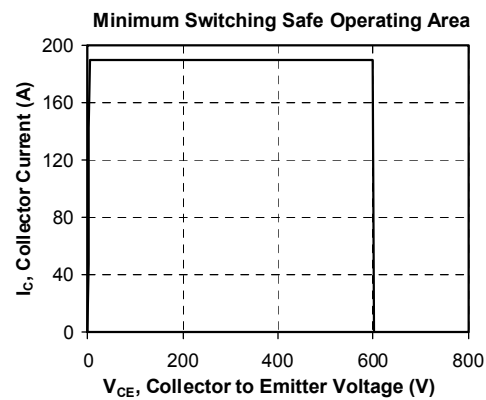
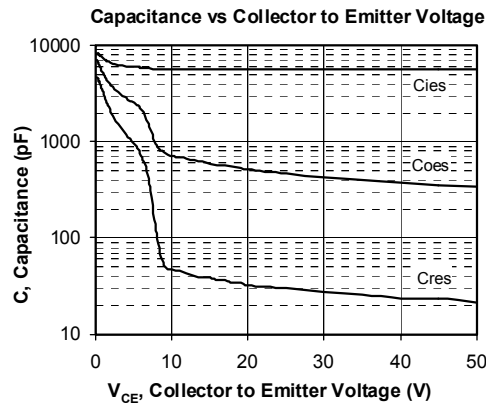
❶ E_{on2} includes diode reverse recovery

❷ In accordance with JEDEC standard JESD24-1

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.