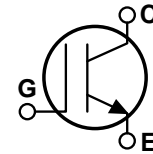
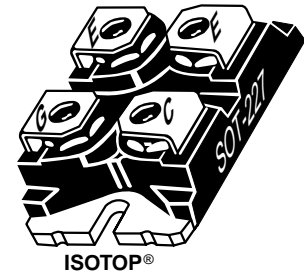


### Fast IGBT

The Fast IGBT is a new generation of high voltage power IGBTs. Using Non-Punch Through Technology the Fast IGBT offers superior ruggedness, fast switching speed and low Collector-Emitter On voltage.

- Low Forward Voltage Drop
- Low Tail Current
- Avalanche Rated
- High Freq. Switching to 20KHz
- Ultra Low Leakage Current
- RBSOA and SCSOA Rated



#### MAXIMUM RATINGS

All Ratings:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	APT100GF60JR	UNIT
$V_{CES}$	Collector-Emitter Voltage	600	Volts
$V_{CGR}$	Collector-Gate Voltage ( $R_{GE} = 20K\Omega$ )	600	
$V_{GE}$	Gate-Emitter Voltage	$\pm 20$	
$I_{C1}$	Continuous Collector Current <sup>(4)</sup> @ $T_C = 25^\circ\text{C}$	100	Amps
$I_{C2}$	Continuous Collector Current @ $T_C = 60^\circ\text{C}$	100	
$I_{CM}$	Pulsed Collector Current <sup>(1)</sup> @ $T_C = 25^\circ\text{C}$	280	
$I_{LM}$	RBSOA Clamped Inductive Load Current @ $R_g = 11\Omega$ $T_C = 125^\circ\text{C}$	200	
$E_{AS}$	Single Pulse Avalanche Energy <sup>(2)</sup>	85	mJ
$P_D$	Total Power Dissipation	500	Watts
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Max. Lead Temp. for Soldering: 0.063" from Case for 10 Sec.	300	

#### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$BV_{CES}$	Collector-Emitter Breakdown Voltage ( $V_{GE} = 0V, I_C = 1.0mA$ )	600			Volts
$V_{GE(TH)}$	Gate Threshold Voltage ( $V_{CE} = V_{GE}, I_C = 700\mu A, T_J = 25^\circ\text{C}$ )	4.5	5.5	6.5	
$V_{CE(ON)}$	Collector-Emitter On Voltage ( $V_{GE} = 15V, I_C = 50A, T_J = 25^\circ\text{C}$ )		2.2	2.7	
	Collector-Emitter On Voltage ( $V_{GE} = 15V, I_C = 50A, T_J = 125^\circ\text{C}$ )		2.8	3.4	
$I_{CES}$	Collector Cut-off Current ( $V_{CE} = V_{CES}, V_{GE} = 0V, T_J = 25^\circ\text{C}$ )			1.0	mA
	Collector Cut-off Current ( $V_{CE} = V_{CES}, V_{GE} = 0V, T_J = 125^\circ\text{C}$ )			5.0	
$I_{GES}$	Gate-Emitter Leakage Current ( $V_{GE} = \pm 20V, V_{CE} = 0V$ )			$\pm 100$	nA

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

APT Website - <http://www.advancedpower.com>

**DYNAMIC CHARACTERISTICS**
**APT100GF60JR**

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C <sub>ies</sub>	Input Capacitance	<b>Capacitance</b> V <sub>GE</sub> = 0V V <sub>CE</sub> = 25V f = 1 MHz		4400		pF
C <sub>oes</sub>	Output Capacitance			480		
C <sub>res</sub>	Reverse Transfer Capacitance			300		
Q <sub>g</sub>	Total Gate Charge <sup>③</sup>	<b>Gate Charge</b> V <sub>GE</sub> = 15V V <sub>CC</sub> = 0.5V <sub>CES</sub> I <sub>C</sub> = I <sub>C2</sub>		335		nC
Q <sub>ge</sub>	Gate-Emitter Charge			40		
Q <sub>gc</sub>	Gate-Collector ("Miller") Charge			195		
t <sub>d(on)</sub>	Turn-on Delay Time	<b>Resistive Switching (25°C)</b> V <sub>GE</sub> = 15V V <sub>CC</sub> = 0.66V <sub>CES</sub> I <sub>C</sub> = I <sub>C2</sub> R <sub>G</sub> = 10Ω		50		ns
t <sub>r</sub>	Rise Time			200		
t <sub>d(off)</sub>	Turn-off Delay Time			190		
t <sub>f</sub>	Fall Time			270		
t <sub>d(on)</sub>	Turn-on Delay Time	<b>Inductive Switching (150°C)</b> V <sub>CLAMP(Peak)</sub> = 0.66V <sub>CES</sub> V <sub>GE</sub> = 15V I <sub>C</sub> = I <sub>C2</sub> R <sub>G</sub> = 10Ω T <sub>J</sub> = +150°C		50		ns
t <sub>r</sub>	Rise Time			170		
t <sub>d(off)</sub>	Turn-off Delay Time			400		
t <sub>f</sub>	Fall Time			95		
E <sub>on</sub>	Turn-on Switching Energy	R <sub>G</sub> = 10Ω T <sub>J</sub> = +150°C		6.3		mJ
E <sub>off</sub>	Turn-off Switching Energy			5.2		
E <sub>ts</sub>	Total Switching Losses			11.5		
t <sub>d(on)</sub>	Turn-on Delay Time	<b>Inductive Switching (25°C)</b> V <sub>CLAMP(Peak)</sub> = 0.66V <sub>CES</sub> V <sub>GE</sub> = 15V I <sub>C</sub> = I <sub>C2</sub> R <sub>G</sub> = 10Ω T <sub>J</sub> = +25°C		55		ns
t <sub>r</sub>	Rise Time			180		
t <sub>d(off)</sub>	Turn-off Delay Time			365		
t <sub>f</sub>	Fall Time			90		
E <sub>ts</sub>	Total Switching Losses			10.5		
g <sub>fe</sub>	Forward Transconductance	V <sub>CE</sub> = 20V, I <sub>C</sub> = I <sub>C2</sub>	6			S

**THERMAL AND MECHANICAL CHARACTERISTICS**

Symbol	Characteristic	MIN	TYP	MAX	UNIT
R <sub>θJC</sub>	Junction to Case			0.32	°C/W
R <sub>θJA</sub>	Junction to Ambient			40	
W <sub>T</sub>	Package Weight		1.03		oz
			29.2		gm
Torque	Mounting Torque (using a 6-32 or 3mm Binding Head Machine Screw)			10	lb•in
				1.5	N•m

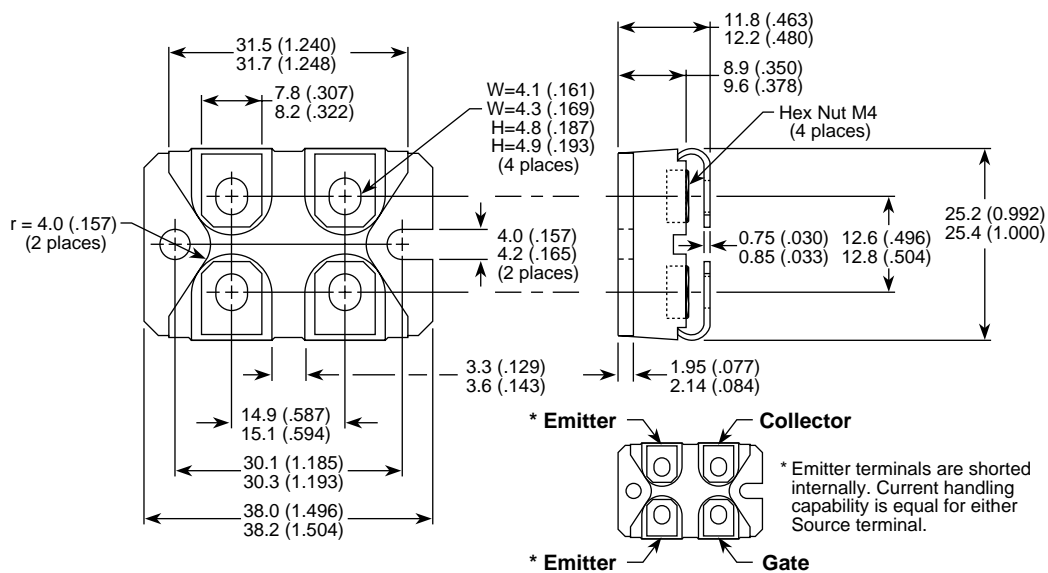
① Repetitive Rating: Pulse width limited by maximum junction temperature.

② I<sub>C</sub> = I<sub>C2</sub>, R<sub>GE</sub> = 25Ω, L = 17μH, T<sub>J</sub> = 25°C

③ See MIL-STD-750 Method 3471

APT Reserves the right to change, without notice, the specifications and information contained herein.

ADVANCE TECHNICAL  
INFORMATION



Dimensions in Millimeters and (Inches)