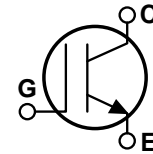
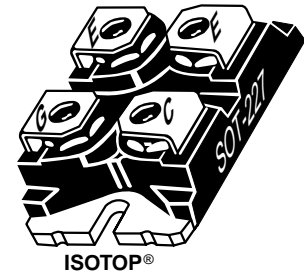


### Fast IGBT

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
$C_{ies}$	Input Capacitance	<b>Capacitance</b> $V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1\text{ MHz}$		4400		pF
$C_{oes}$	Output Capacitance			480		
$C_{res}$	Reverse Transfer Capacitance			300		
$Q_g$	Total Gate Charge <sup>③</sup>	<b>Gate Charge</b> $V_{GE} = 15V$ $V_{CC} = 0.5V_{CES}$ $I_C = I_{C2}$		335		nC
$Q_{ge}$	Gate-Emitter Charge			40		
$Q_{gc}$	Gate-Collector ("Miller") Charge			195		
$t_{d(on)}$	Turn-on Delay Time	<b>Resistive Switching (25°C)</b> $V_{GE} = 15V$ $V_{CC} = 0.66V_{CES}$ $I_C = I_{C2}$ $R_G = 10\Omega$		50		ns
$t_r$	Rise Time			200		
$t_{d(off)}$	Turn-off Delay Time			190		
$t_f$	Fall Time			270		
$t_{d(on)}$	Turn-on Delay Time	<b>Inductive Switching (150°C)</b> $V_{CLAMP(Peak)} = 0.66V_{CES}$ $V_{GE} = 15V$ $I_C = I_{C2}$ $R_G = 10\Omega$ $T_J = +150^\circ C$		50		ns
$t_r$	Rise Time			170		
$t_{d(off)}$	Turn-off Delay Time			400		
$t_f$	Fall Time			95		
$E_{on}$	Turn-on Switching Energy	$R_G = 10\Omega$ $T_J = +150^\circ C$		6.3		mJ
$E_{off}$	Turn-off Switching Energy			5.2		
$E_{ts}$	Total Switching Losses			11.5		
$t_{d(on)}$	Turn-on Delay Time	<b>Inductive Switching (25°C)</b> $V_{CLAMP(Peak)} = 0.66V_{CES}$ $V_{GE} = 15V$ $I_C = I_{C2}$ $R_G = 10\Omega$ $T_J = +25^\circ C$		55		ns
$t_r$	Rise Time			180		
$t_{d(off)}$	Turn-off Delay Time			365		
$t_f$	Fall Time			90		
$E_{ts}$	Total Switching Losses			10.5		
$g_{fe}$	Forward Transconductance	$V_{CE} = 20V, I_C = I_{C2}$	6			S

**THERMAL AND MECHANICAL CHARACTERISTICS**

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.32	°C/W
$R_{\theta JA}$	Junction to Ambient			40	
$W_T$	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

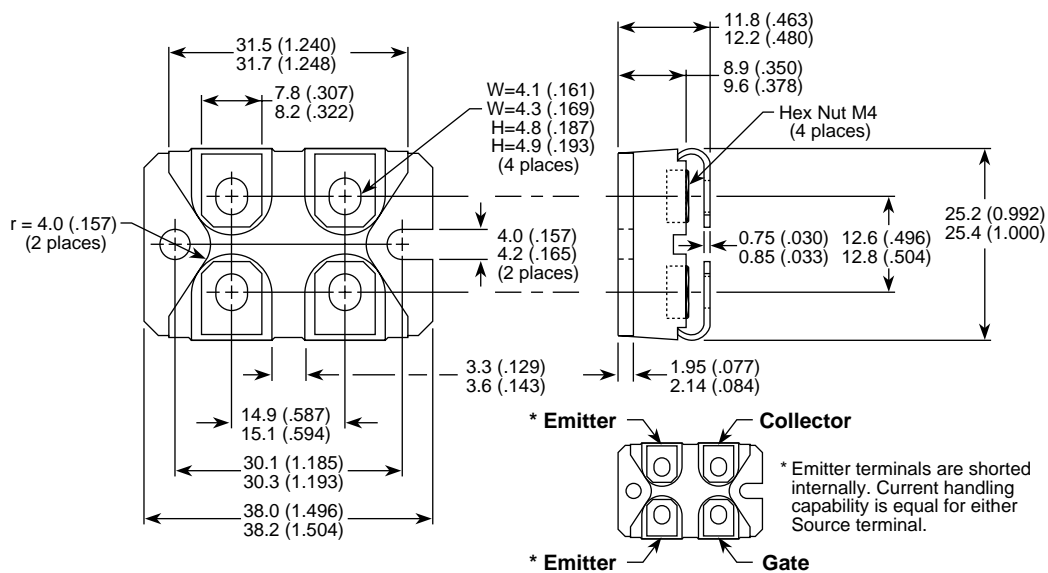
① Repetitive Rating: Pulse width limited by maximum junction temperature.

②  $I_C = I_{C2}$ ,  $R_{GE} = 25\Omega$ ,  $L = 17\mu H$ ,  $T_J = 25^\circ C$

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)