



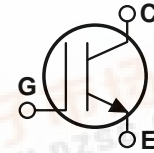
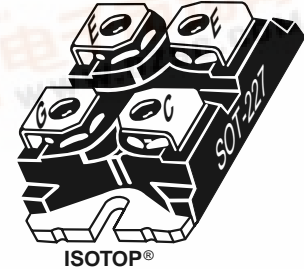
APT100GF60JR

600V 100A

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	± 20	
I_{C1}	Continuous Collector Current ^④ @ $T_C = 25^\circ\text{C}$	100	Amps
I_{C2}	Continuous Collector Current @ $T_C = 60^\circ\text{C}$	100	
I_{CM}	Pulsed Collector Current ^① @ $T_C = 25^\circ\text{C}$	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 ^②	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 ($V_{GE} = \pm 20V, V_{CE} = 0V$)			± 100	nA

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

DYNAMIC CHARACTERISTICS

APT100GF60JR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{ies}	Input Capacitance	Capacitance $V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1\text{ MHz}$		4400		pF
C_{oes}	Output Capacitance			480		
C_{res}	Reverse Transfer Capacitance			300		
Q_g	Total Gate Charge ^③	Gate Charge $V_{GE} = 15V$ $V_{CC} = 0.5V_{CES}$ $I_C = I_{C2}$		335		nC
Q_{ge}	Gate-Emitter Charge			40		
Q_{gc}	Gate-Collector ("Miller") Charge			195		
$t_{d(on)}$	Turn-on Delay Time	Resistive Switching (25°C) $V_{GE} = 15V$ $V_{CC} = 0.66V_{CES}$ $I_C = I_{C2}$ $R_G = 10\Omega$		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	Inductive Switching (150°C) $V_{CLAMP(Peak)} = 0.66V_{CES}$ $V_{GE} = 15V$ $I_C = I_{C2}$ $R_G = 10\Omega$ $T_J = +150^\circ C$		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			6.3		
E_{off}	Turn-off Switching Energy		5.2			
E_{ts}	Total Switching Losses		11.5			
$t_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{CLAMP(Peak)} = 0.66V_{CES}$ $V_{GE} = 15V$ $I_C = I_{C2}$ $R_G = 10\Omega$ $T_J = +25^\circ C$		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

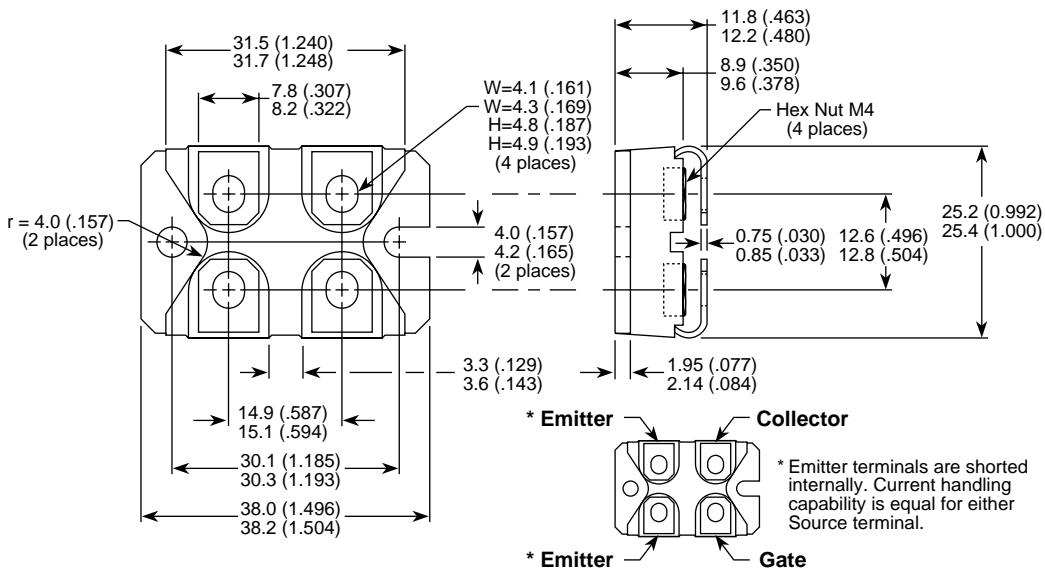
① Repetitive Rating: Pulse width limited by maximum junction temperature.

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)