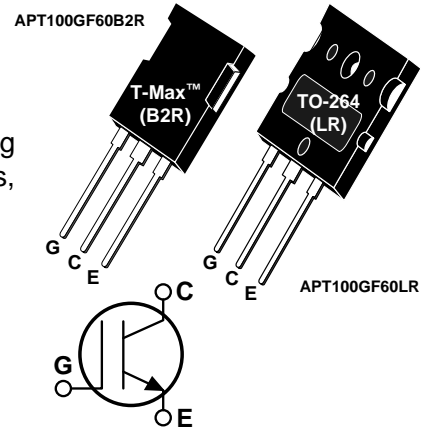


Fast IGBT

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	APT100GF60B2R/LR	UNIT
V_{CES}	Collector-Emitter Voltage	600	Volts
V_{CGR}	Collector-Gate Voltage ($R_{GE} = 20\text{K}\Omega$)	600	
V_{EC}	Emitter-Collector Voltage	15	
V_{GE}	Gate-Emitter Voltage	± 20	
I_{C1}	Continuous Collector Current ⁽⁵⁾ @ $T_C = 25^\circ\text{C}$	100	Amps
I_{C2}	Continuous Collector Current @ $T_C = 90^\circ\text{C}$	100	
I_{CM1}	Pulsed Collector Current ⁽¹⁾ @ $T_C = 25^\circ\text{C}$	280	
I_{CM2}	Pulsed Collector Current ⁽¹⁾ @ $T_C = 90^\circ\text{C}$	200	
E_{AS}	Single Pulse Avalanche Energy ⁽²⁾	85	mJ
P_D	Total Power Dissipation	390	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 ($V_{GE} = 0\text{V}, I_C = 1.0\text{mA}$)	600			Volts
RBV_{CES}	Collector-Emitter Reverse Breakdown Voltage ($V_{GE} = 0\text{V}, I_C = 50\text{mA}$)	-15			
$V_{GE(TH)}$	Gate Threshold Voltage ($V_{CE} = V_{GE}, I_C = 700\mu\text{A}, T_J = 25^\circ\text{C}$)	4.5	5.5	6.5	
$V_{CE(ON)}$	Collector-Emitter On Voltage ($V_{GE} = 15\text{V}, I_C = 50\text{A}, T_J = 25^\circ\text{C}$)		2.2	2.7	
	Collector-Emitter On Voltage ($V_{GE} = 15\text{V}, I_C = 50\text{A}, T_J = 125^\circ\text{C}$)		2.8	3.4	
I_{CES}	Collector Cut-off Current ($V_{CE} = V_{CES}, V_{GE} = 0\text{V}, T_J = 25^\circ\text{C}$)			1.0	mA
	Collector Cut-off Current ($V_{CE} = V_{CES}, V_{GE} = 0\text{V}, T_J = 125^\circ\text{C}$)			TBD	
I_{GES}	Gate-Emitter Leakage Current ($V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}$)			± 100	nA

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

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DYNAMIC CHARACTERISTICS (IGBT)

APT100GF60B2R/LR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C _{ies}	Input Capacitance	Capacitance V _{GE} = 0V V _{CE} = 25V f = 1 MHz		4400	6000	pF
C _{oes}	Output Capacitance			480	675	
C _{res}	Reverse Transfer Capacitance			300	450	
Q _g	Total Gate Charge ^③	Gate Charge V _{GE} = 15V V _{CC} = 0.5V _{CES} I _C = I _{C2}		126		nC
Q _{ge}	Gate-Emitter Charge			20		
Q _{gc}	Gate-Collector ("Miller") Charge			75		
t _{d(on)}	Turn-on Delay Time	Resistive Switching (25°C) V _{GE} = 15V V _{CC} = 0.80V _{CES} I _C = I _{C2} R _G = 10Ω		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 = 10Ω T _J = +150°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	T _J = +150°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	Inductive Switching (25°C) V _{CLAMP(Peak)} = 0.66V _{CES} V _{GE} = 15V I _C = I _{C2} R _G = 10Ω T _J = +25°C		5.5		ns
t _r	Rise Time			180		
t _{d(off)}	Turn-off Delay Time			360		
t _f	Fall Time			90		
E _{ts}	Total Switching Losses ^④			10.5		
g _{fe}	Forward Transconductance	V _{CE} = 20V, I _C = I _{C2}	6			S

THERMAL AND MECHANICAL CHARACTERISTICS (IGBT and FRED)

Symbol	Characteristic	MIN	TYP	MAX	UNIT
R _{θJC}	Junction to Case (IGBT)			0.42	°C/W
	Junction to Case (FRED)			0.90	
R _{θJA}	Junction to Ambient			40	
W _T	Package Weight		0.22		oz
			6.1		gm
Torque	Mounting Torque using a 6-32 or 3mm Binding Head Machine Screw			10	lb•in
				1.1	N•m

① Repetitive Rating: Pulse width limited by maximum junction temperature. ⑤ The maximum current is limited by lead temperature.

② I_C = I_{C2}, V_{CC} = 50V, R_{GE} = 25Ω, L = 17μH, T_J = 25°C

③ See MIL-STD-750 Method 3471

④ The maximum current is limited by lead temperature.

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

PRELIMINARY

