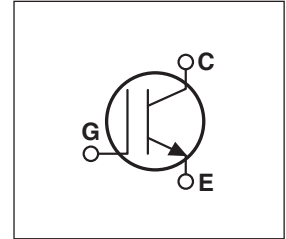
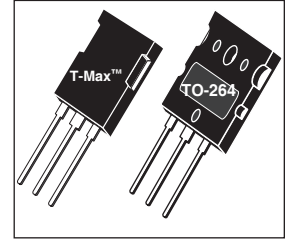


Utilizing the latest Non-Punch Through (NPT) Field Stop technology, these IGBT's have a very short, low amplitude tail current and low Eoff. The Trench Gate design results in superior $V_{CE(on)}$ performance. Easy paralleling results from very tight parameter distribution and slightly positive $V_{CE(on)}$ temperature coefficient. Built-in gate resistance ensures ultra-reliable operation. Low gate charge simplifies gate drive design and minimizes losses.

- **1200V NPT Field Stop**
- **Trench Gate: Low VCE(on)**
- **Easy Paralleling**
- **10µs Short Circuit Capability**
- **Intergrated Gate Resistor: Low EMI, High Reliability**



Applications: Welding, Inductive Heating, Solar Inverters, SMPS, Motor drives, UPS

MAXIMUM RATINGS

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

Symbol	Parameter	APT75GN120B2(G)_L(G)	UNIT
V_{CES}	Collector-Emitter Voltage	1200	Volts
V_{GE}	Gate-Emitter Voltage	± 20	
I_{C1}	Continuous Collector Current ^③ @ $T_C = 25^\circ\text{C}$	199	Amps
I_{C2}	Continuous Collector Current @ $T_C = 110^\circ\text{C}$	99	
I_{CM}	Pulsed Collector Current ^① @ $T_C = 150^\circ\text{C}$	225	
SSOA	Switching Safe Operating Area @ $T_J = 150^\circ\text{C}$	225A @ 1200V	
P_D	Total Power Dissipation	833	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	Units
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage ($V_{GE} = 0V, I_C = 3mA$)	1200			Volts
$V_{GE(TH)}$	Gate Threshold Voltage ($V_{CE} = V_{GE}, I_C = 3mA, T_J = 25^\circ\text{C}$)	5.0	5.8	6.5	
$V_{CE(ON)}$	Collector-Emitter On Voltage ($V_{GE} = 15V, I_C = 75A, T_J = 25^\circ\text{C}$)	1.4	1.7	2.1	
	Collector-Emitter On Voltage ($V_{GE} = 15V, I_C = 75A, T_J = 125^\circ\text{C}$)		3		
I_{CES}	Collector Cut-off Current ($V_{CE} = 1200V, V_{GE} = 0V, T_J = 25^\circ\text{C}$) ^②			500	μA
	Collector Cut-off Current ($V_{CE} = 1200V, V_{GE} = 0V, T_J = 125^\circ\text{C}$) ^②			TBD	
I_{GES}	Gate-Emitter Leakage Current ($V_{GE} = \pm 20V$)			600	nA
R_{GINT}	Intergrated Gate Resistor		10		Ω



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

DYNAMIC CHARACTERISTICS

APT75GN120B2(G)_L(G)

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT	
C_{ies}	Input Capacitance	Capacitance $V_{GE} = 0V, V_{CE} = 25V$ $f = 1 \text{ MHz}$		4800		pF	
C_{oes}	Output Capacitance			275			
C_{res}	Reverse Transfer Capacitance			210			
V_{GEP}	Gate-to-Emitter Plateau Voltage	Gate Charge $V_{GE} = 15V$ $V_{CE} = 600V$ $I_C = 75A$		9.0		V	
Q_g	Total Gate Charge ^③			425			
Q_{ge}	Gate-Emitter Charge			30			
Q_{gc}	Gate-Collector ("Miller") Charge			245			
SSOA	Switching Safe Operating Area	$T_J = 150^\circ\text{C}, R_G = 4.3\Omega^{\text{⑦}}, V_{GE} = 15V, L = 100\mu\text{H}, V_{CE} = 1200V$	225			A	
SCSOA	Short Circuit Safe Operating Area	$V_{CC} = 960V, V_{GE} = 15V, T_J = 125^\circ\text{C}, R_G = 5\Omega^{\text{⑦}}$	45			μs	
$t_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{CC} = 800V$ $V_{GE} = 15V$ $I_C = 75A$ $R_G = 5\Omega^{\text{⑦}}$ $T_J = +25^\circ\text{C}$		TBD		ns	
t_r	Current Rise Time			TBD			
$t_{d(off)}$	Turn-off Delay Time			TBD			
t_f	Current Fall Time			TBD			
E_{on1}	Turn-on Switching Energy ^④				TBD		μJ
E_{on2}	Turn-on Switching Energy (Diode) ^⑤				TBD		
E_{off}	Turn-off Switching Energy ^⑥				TBD		
$t_{d(on)}$	Turn-on Delay Time		Inductive Switching (125°C) $V_{CC} = 800V$ $V_{GE} = 15V$ $I_C = 75A$ $R_G = 5\Omega^{\text{⑦}}$ $T_J = +125^\circ\text{C}$		TBD		ns
t_r	Current Rise Time				TBD		
$t_{d(off)}$	Turn-off Delay Time				TBD		
t_f	Current Fall Time			TBD			
E_{on1}	Turn-on Switching Energy ^④				TBD		μJ
E_{on2}	Turn-on Switching Energy (Diode) ^⑤				TBD		
E_{off}	Turn-off Switching Energy ^⑥				TBD		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case (IGBT)			.15	$^\circ\text{C/W}$
$R_{\theta JC}$	Junction to Case (DIODE)			N/A	
W_T	Package Weight		5.9		gm

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

② For Combi devices, I_{ces} includes both IGBT and FRED leakages

③ See MIL-STD-750 Method 3471.

④ E_{on1} is the clamped inductive turn-on-energy of the IGBT only, without the effect of a commutating diode reverse recovery current adding to the IGBT turn-on loss. (See Figure 24.)

⑤ E_{on2} is the clamped inductive turn-on energy that includes a commutating diode reverse recovery current in the IGBT turn-on switching loss. (See Figures 21, 22.)

⑥ E_{off} is the clamped inductive turn-off energy measured in accordance with JEDEC standard JESD24-1. (See Figures 21, 23.)

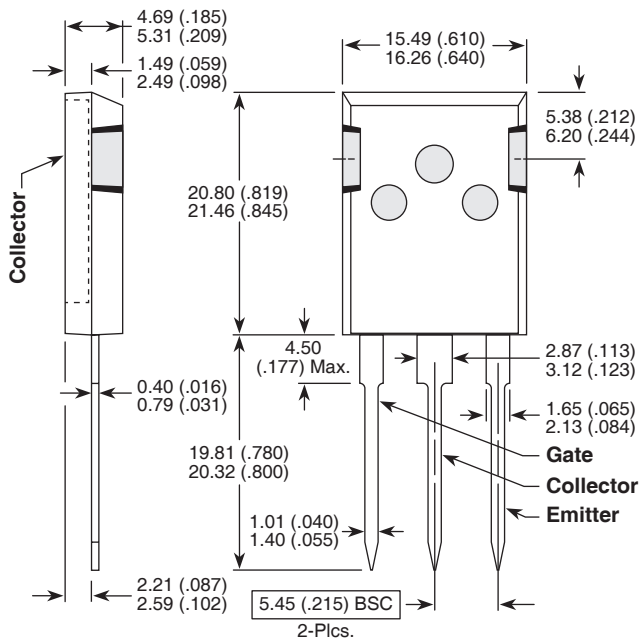
⑦ R_G is external gate resistance, not including R_{Gint} nor gate driver impedance. (MIC4452)

⑧ Current limited by lead temperature.

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

T-MAX™ (B2) Package Outline

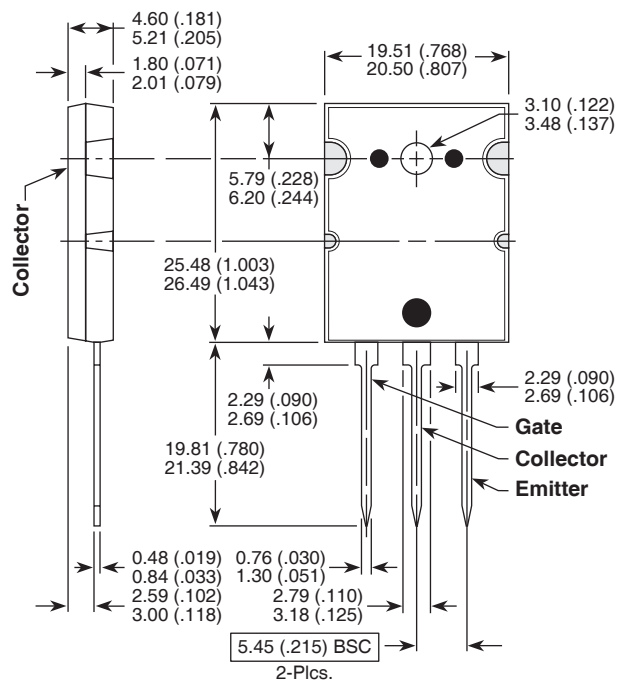
ⓔ1 SAC: Tin, Silver, Copper



Dimensions in Millimeters and (Inches)

TO-264(L) Package Outline

ⓔ1 SAC: Tin, Silver, Copper



Dimensions in Millimeters and (Inches)

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. US and Foreign patents pending. All Rights Reserved.