

Dynamic Characteristics

$T_J = 25^{\circ}\text{C}$ unless otherwise specified

APT68GA60B_S

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	Capacitance $V_{GE} = 0V, V_{CE} = 25V$ $f = 1\text{MHz}$		5230		pF
C_{oes}	Output Capacitance			526		
C_{res}	Reverse Transfer Capacitance			59		
Q_g	Total Gate Charge ³	Gate Charge $V_{GE} = 15V$ $V_{CE} = 300V$ $I_C = 40A$		198		nC
Q_{ge}	Gate-Emitter Charge			32		
Q_{gc}	Gate- Collector Charge			66		
SSOA	Switching Safe Operating Area	$T_J = 150^{\circ}\text{C}, R_G = 4.7\Omega^4, V_{GE} = 15V,$ $L = 100\mu\text{H}, V_{CE} = 600V$	202			A
$t_{d(on)}$	Turn-On Delay Time	Inductive Switching (25°C) $V_{CC} = 400V$ $V_{GE} = 15V$ $I_C = 40A$ $R_G = 4.7\Omega^4$ $T_J = +25^{\circ}\text{C}$		21		ns
t_r	Current Rise Time			27		
$t_{d(off)}$	Turn-Off Delay Time			133		
t_f	Current Fall Time			88		
E_{on2}	Turn-On Switching Energy			715		μJ
E_{off}	Turn-Off Switching Energy ⁶			607		
$t_{d(on)}$	Turn-On Delay Time	Inductive Switching (125°C) $V_{CC} = 400V$ $V_{GE} = 15V$ $I_C = 40A$ $R_G = 4.7\Omega^4$ $T_J = +125^{\circ}\text{C}$		20		ns
t_r	Current Rise Time			26		
$t_{d(off)}$	Turn-Off Delay Time			175		
t_f	Current Fall Time			129		
E_{on2}	Turn-On Switching Energy			1117		μJ
E_{off}	Turn-Off Switching Energy ⁶			1025		

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

2 Pulse test: Pulse Width $< 380\mu\text{s}$, duty cycle $< 2\%$.

3 See Mil-Std-750 Method 3471.

4 R_G is external gate resistance, not including internal gate resistance or gate driver impedance. (MIC4452)

5 E_{on2} is the clamped inductive turn on energy that includes a commutating diode reverse recovery current in the IGBT turn on energy loss. A combi device is used for the clamping diode.

6 E_{off} is the clamped inductive turn-off energy measured in accordance with JEDEC standard JESD24-1.

7 Continuous current limited by package lead temperature.

Microsemi reserves the right to change, without notice, the specifications and information contained herein.

Typical Performance Curves

APT68GA60B_S

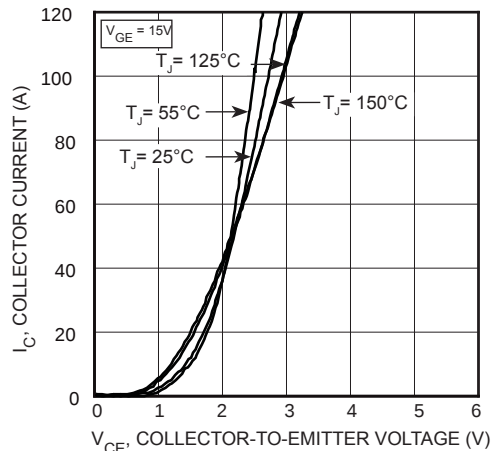


FIGURE 1, Output Characteristics ($T_J = 25^\circ\text{C}$)

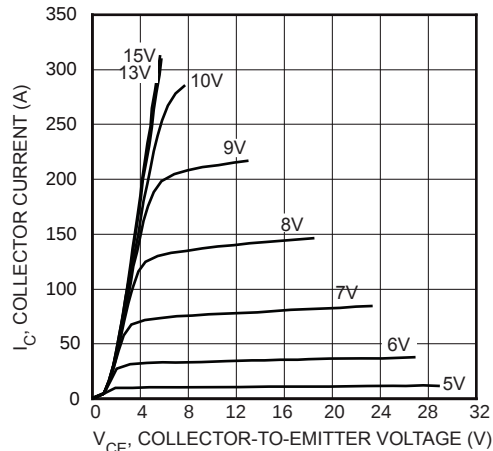


FIGURE 2, Output Characteristics ($T_J = 25^\circ\text{C}$)

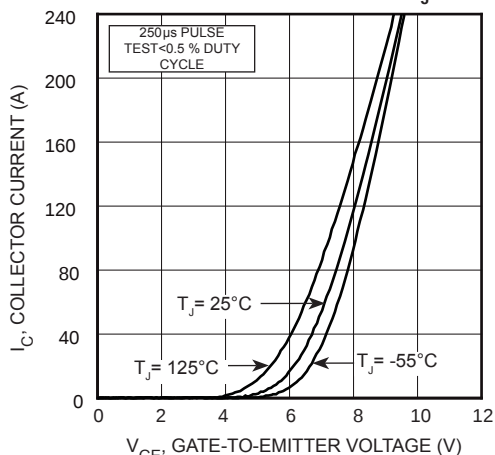


FIGURE 3, Transfer Characteristics

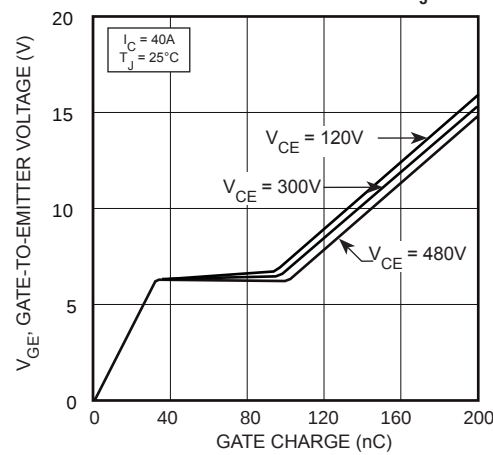


FIGURE 4, Gate charge

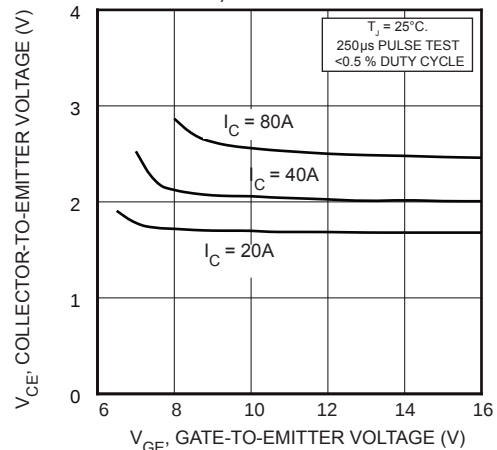


FIGURE 5, On State Voltage vs Gate-to-Emitter Voltage

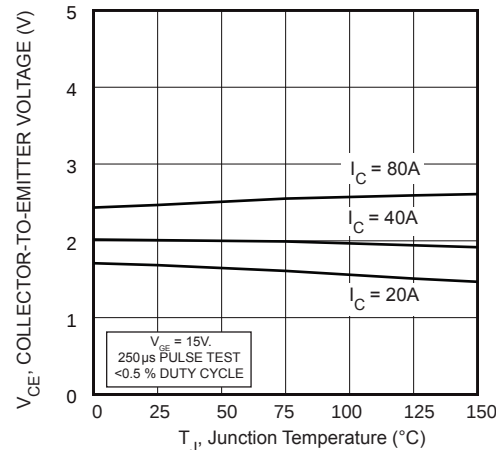


FIGURE 6, On State Voltage vs Junction Temperature

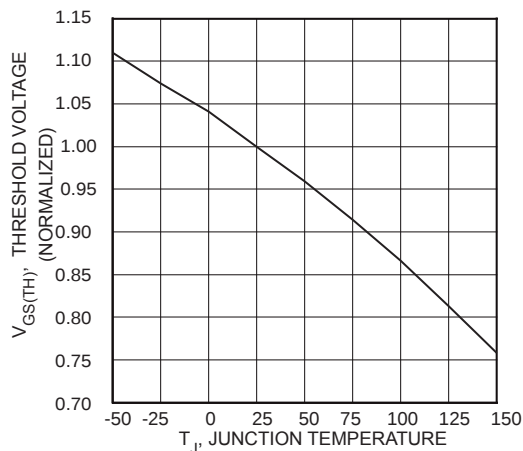


FIGURE 7, Threshold Voltage vs Junction Temperature

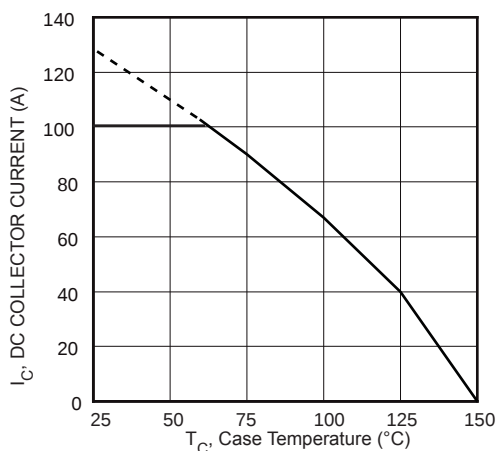


FIGURE 8, DC Collector Current vs Case Temperature

Typical Performance Curves

APT68GA60B_S

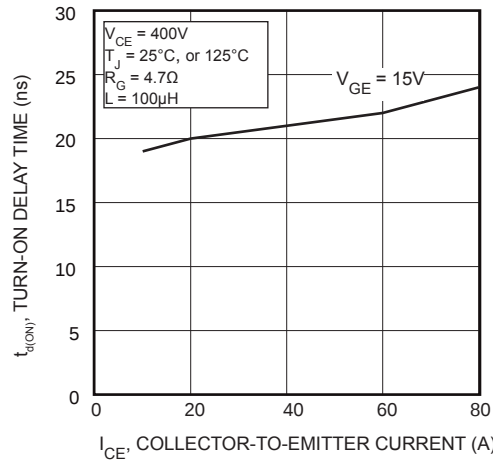


FIGURE 9, Turn-On Delay Time vs Collector Current

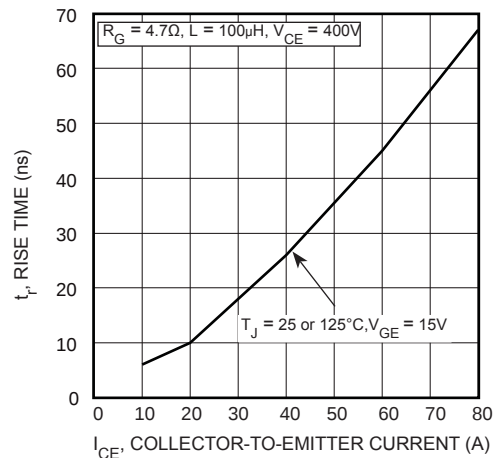


FIGURE 11, Current Rise Time vs Collector Current

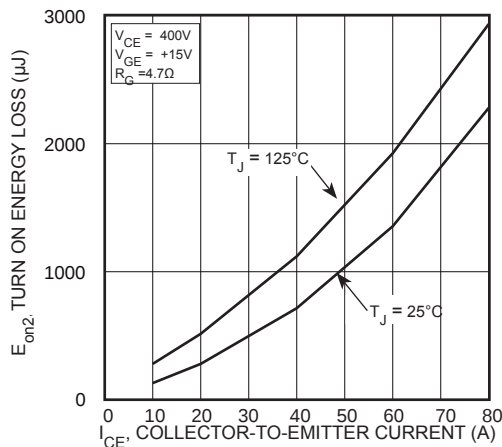


FIGURE 13, Turn-On Energy Loss vs Collector Current

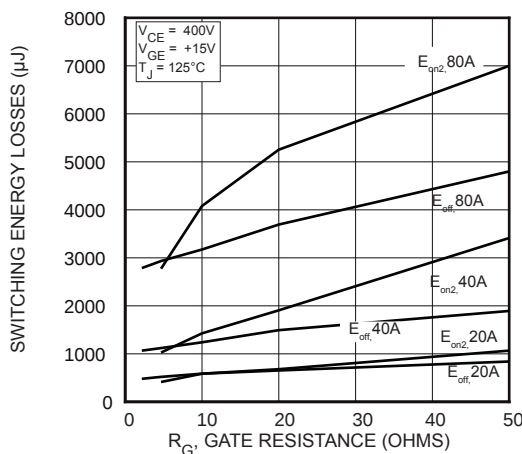


FIGURE 15, Switching Energy Losses vs Gate Resistance

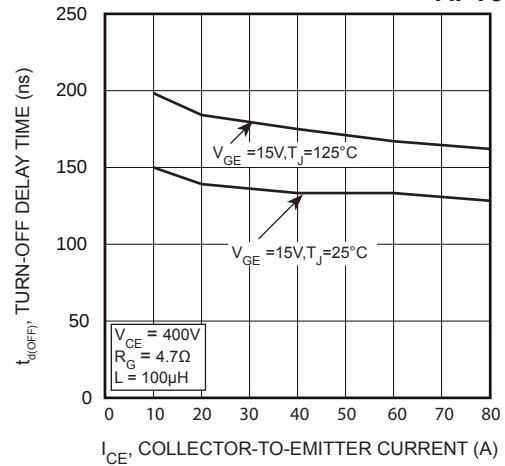


FIGURE 10, Turn-Off Delay Time vs Collector Current

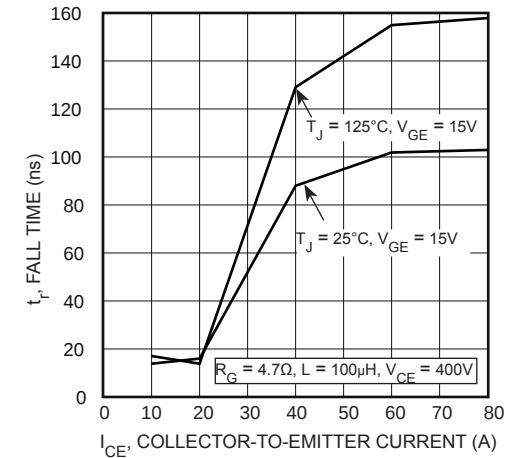


FIGURE 12, Current Fall Time vs Collector Current

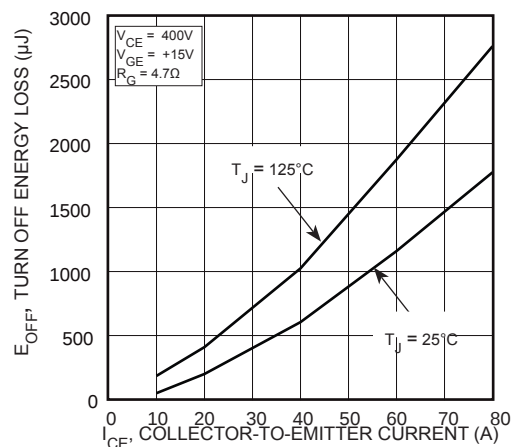


FIGURE 14, Turn-Off Energy Loss vs Collector Current

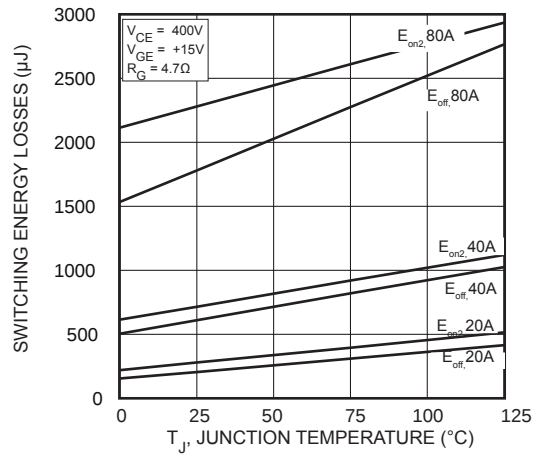


FIGURE 16, Switching Energy Losses vs Junction Temperature

Typical Performance Curves

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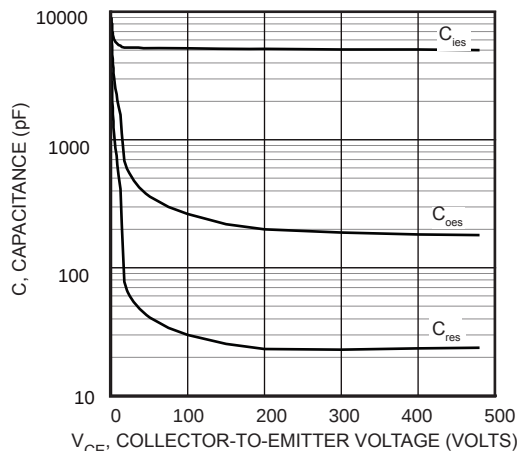


FIGURE 17, Capacitance vs Collector-To-Emitter Voltage

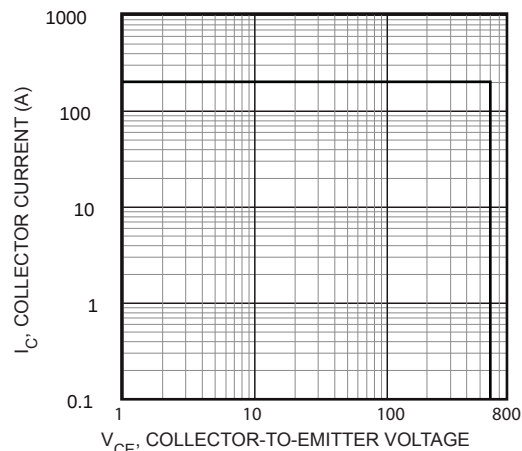


FIGURE 18, Minimum Switching Safe Operating Area

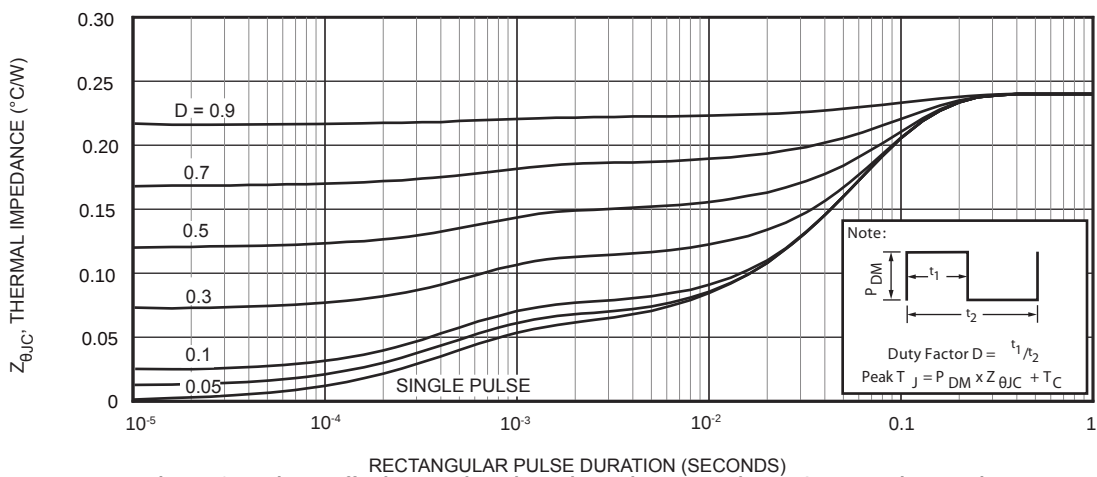
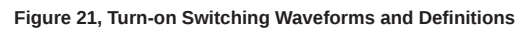


Figure 19, Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration



ⓔ1 SAC: Tin, Silver, Copper



③ 100% Sn

