

Static Characteristics

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

APT56M50B2_L

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{BR(DSS)}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	500			V
$\Delta V_{BR(DSS)}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}, I_D = 250\mu A$		0.60		V/ $^\circ\text{C}$
$R_{DS(on)}$	Drain-Source On Resistance ^③	$V_{GS} = 10V, I_D = 28A$		0.085	0.10	Ω
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5mA$	3	4	5	V
$\Delta V_{GS(th)}/\Delta T_J$	Threshold Voltage Temperature Coefficient			-10		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 500V$ $V_{GS} = 0V$			100	μA
		$T_J = 125^\circ\text{C}$			500	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 30V$			± 100	nA

Dynamic Characteristics

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

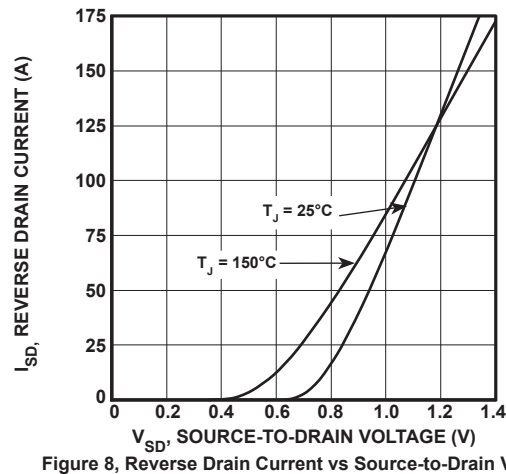
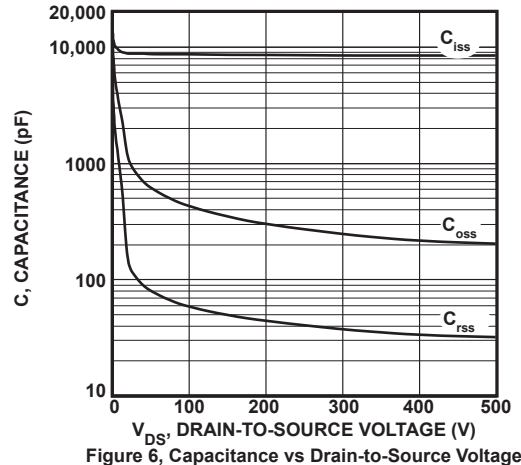
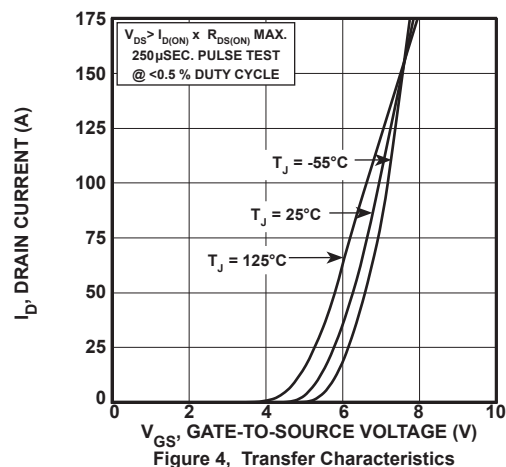
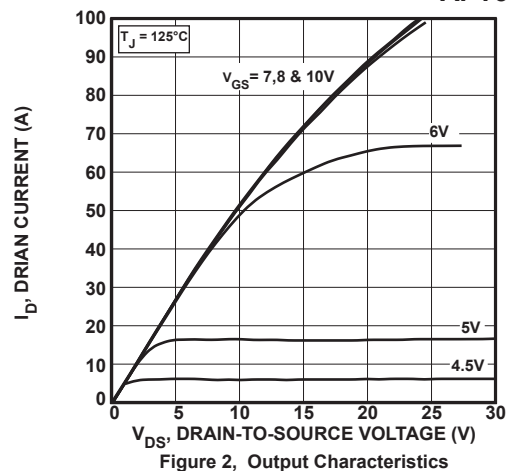
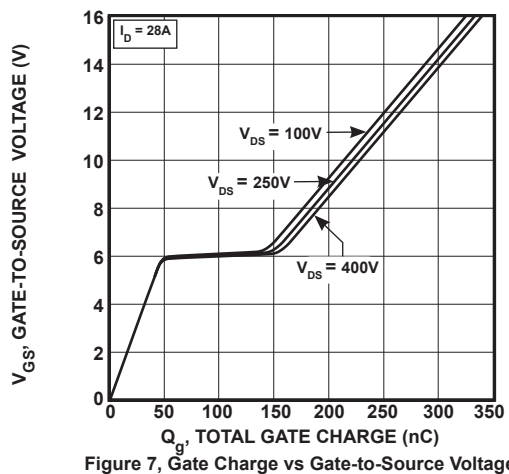
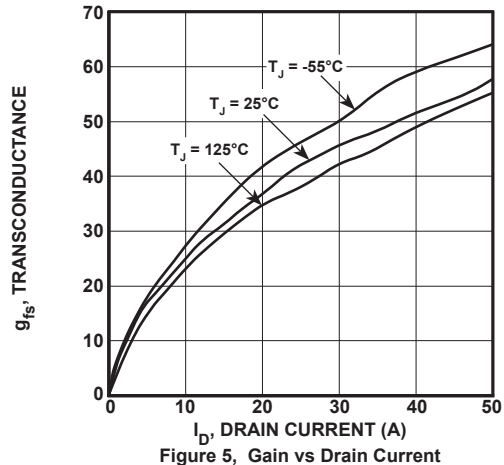
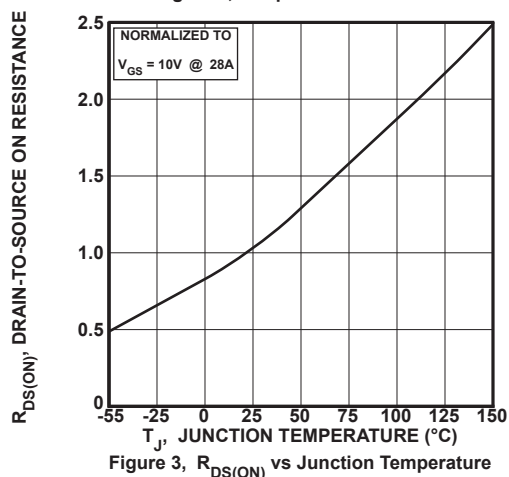
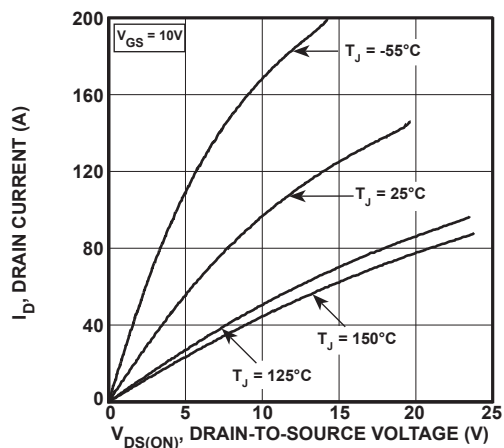
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
g_{fs}	Forward Transconductance	$V_{DS} = 50V, I_D = 28A$		43		S
C_{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1MHz$		8800		pF
C_{rss}	Reverse Transfer Capacitance			120		
C_{oss}	Output Capacitance			945		
$C_{o(cr)}^{④}$	Effective Output Capacitance, Charge Related	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 333V$		550		
$C_{o(er)}^{⑤}$	Effective Output Capacitance, Energy Related			275		
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 10V, I_D = 28A,$ $V_{DS} = 250V$		220		nC
Q_{gs}	Gate-Source Charge			50		
Q_{gd}	Gate-Drain Charge			100		
$t_{d(on)}$	Turn-On Delay Time	Resistive Switching $V_{DD} = 333V, I_D = 28A$ $R_G = 4.7\Omega^{⑥}, V_{GG} = 15V$		38		ns
t_r	Current Rise Time			45		
$t_{d(off)}$	Turn-Off Delay Time			100		
t_f	Current Fall Time			33		

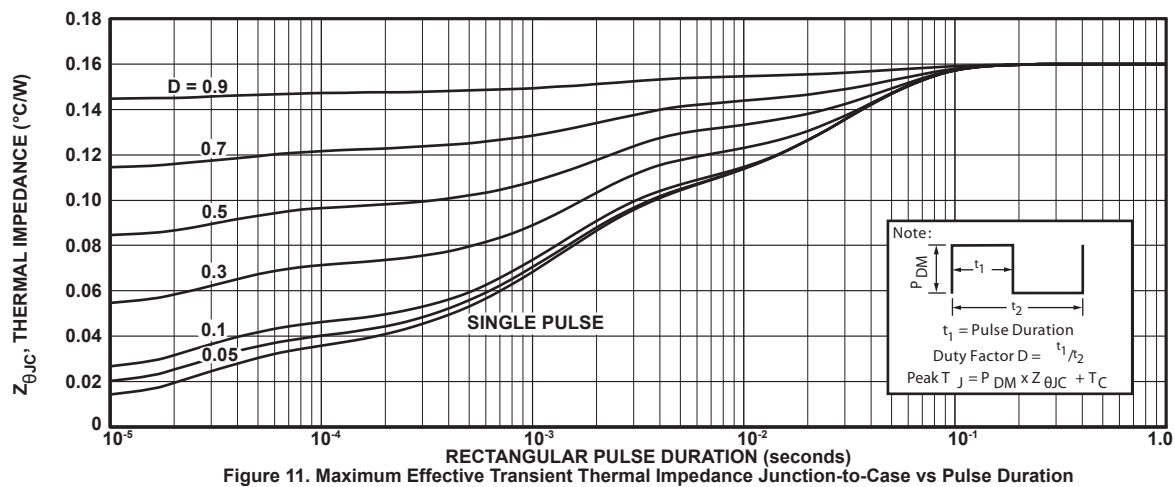
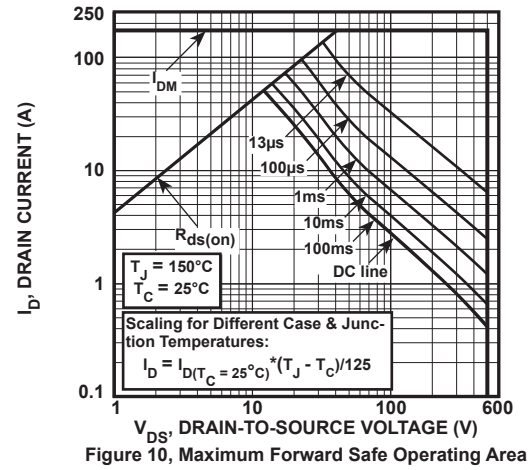
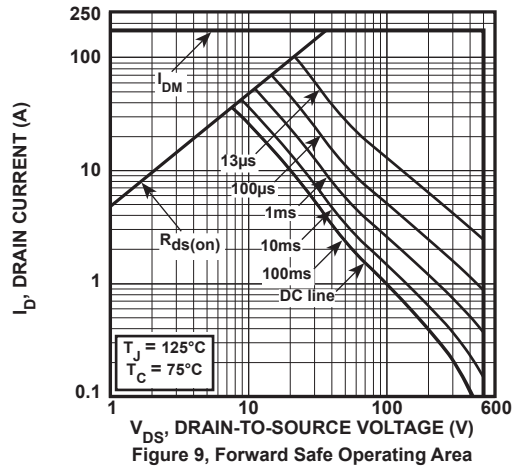
Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_S	Continuous Source Current (Body Diode)	MOSFET symbol showing the integral reverse p-n junction diode (body diode)			56	A
I_{SM}	Pulsed Source Current (Body Diode) ^①				175	
V_{SD}	Diode Forward Voltage	$I_{SD} = 28A, T_J = 25^\circ\text{C}, V_{GS} = 0V$			1	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 28A^{②}$ $di_{SD}/dt = 100A/\mu s, T_J = 25^\circ\text{C}$		660		ns
Q_{rr}	Reverse Recovery Charge			13.2		μC
dv/dt	Peak Recovery dv/dt	$I_{SD} \leq 28A, di/dt \leq 1000A/\mu s, V_{DD} = 333V,$ $T_J = 125^\circ\text{C}$			8	V/ns

- ① Repetitive Rating: Pulse width and case temperature limited by maximum junction temperature.
- ② Starting at $T_J = 25^\circ\text{C}, L = 3.06mH, R_G = 4.7\Omega, I_{AS} = 28A$.
- ③ Pulse test: Pulse Width < 380 μs , duty cycle < 2%.
- ④ $C_{o(cr)}$ is defined as a fixed capacitance with the same stored charge as C_{OSS} with $V_{DS} = 67\%$ of $V_{(BR)DSS}$.
- ⑤ $C_{o(er)}$ is defined as a fixed capacitance with the same stored energy as C_{OSS} with $V_{DS} = 67\%$ of $V_{(BR)DSS}$. To calculate $C_{o(er)}$ for any value of V_{DS} less than $V_{(BR)DSS}$, use this equation: $C_{o(er)} = -2.04E-7/V_{DS}^2 + 4.76E-8/V_{DS} + 1.36E-10$.
- ⑥ R_G is external gate resistance, not including internal gate resistance or gate driver impedance. (MIC4452)

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

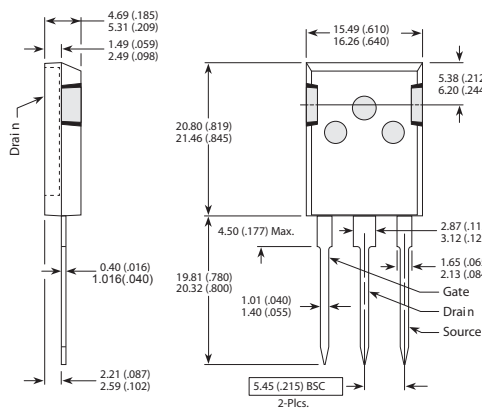




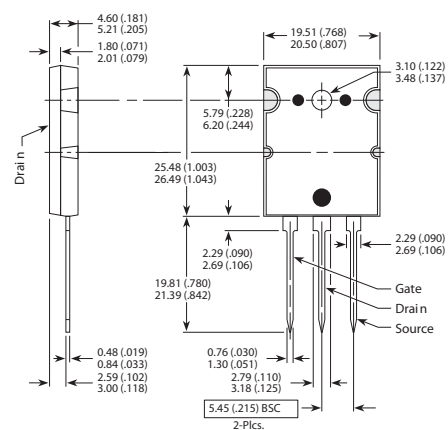
T-MAX™ (B2) Package Outline

TO-264 (L) Package Outline

e3 100% Sn Plated



Dimensions in Millimeters (Inches)



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