

Static Characteristics
T_J = 25°C unless otherwise specified
APT56F50B2_L

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _{BR(DSS)}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	500			V
ΔV _{BR(DSS)} /ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D = 250μA		0.60		V/°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	2.5	4	5	V
ΔV _{GS(th)} /ΔT _J	Threshold Voltage Temperature Coefficient			-10		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 500V V _{GS} = 0V			250 1000	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±30V			±100	nA

Dynamic Characteristics
T_J = 25°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 to 333V		550		
C _{o(er)} ^⑤	Effective Output Capacitance, Energy Related			275		
Q _g	Total Gate Charge	V _{GS} = 0 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 = 4.7Ω ^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)			38	A
I _{SM}	Pulsed Source Current (Body Diode) ^①				175	
V _{SD}	Diode Forward Voltage	I _{SD} = 28A, T _J = 25°C, V _{GS} = 0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} = 28A ^③ di _{SD} /dt = 100A/μs V _{DD} = 100V	T _J = 25°C		280	ns
			T _J = 125°C		520	
Q _{rr}	Reverse Recovery Charge		T _J = 25°C	1.20		μC
			T _J = 125°C	3.07		
I _{rrm}	Reverse Recovery Current		T _J = 25°C	10.1		A
			T _J = 125°C	14.5		
dv/dt	Peak Recovery dv/dt	I _{SD} ≤ 28A, di/dt ≤ 1000A/μs, V _{DD} = 333V, T _J = 125°C			20	V/ns

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

② Starting at T_J = 25°C, L = 3.06mH, R_G = 25Ω, I_{AS} = 28A.

③ Pulse test: Pulse Width < 380μs, 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.

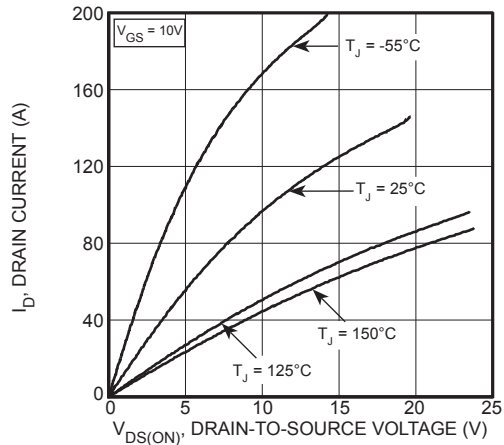


Figure 1, Output Characteristics

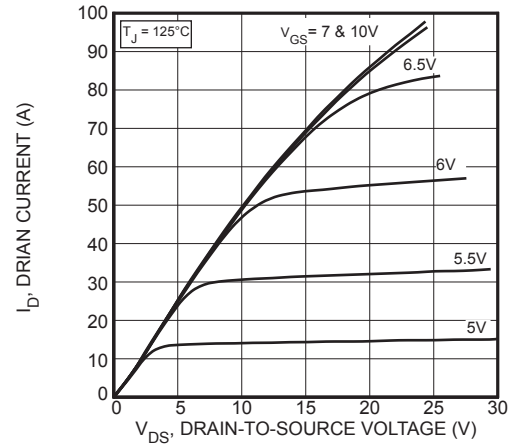


Figure 2, Output Characteristics

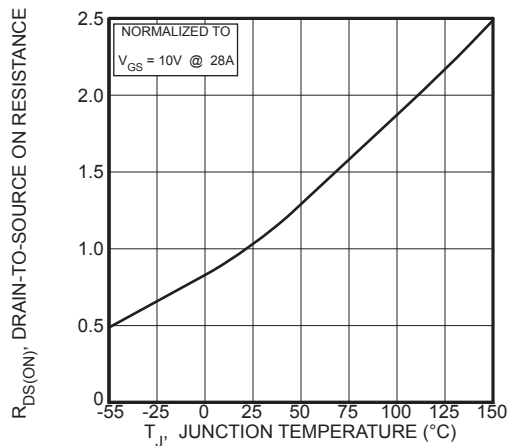
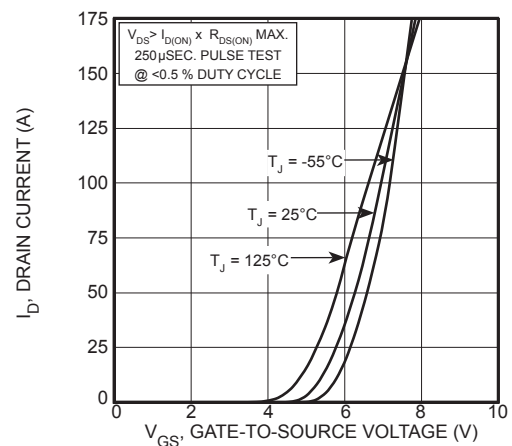
Figure 3, $R_{DS(ON)}$ vs Junction Temperature

Figure 4, Transfer Characteristics

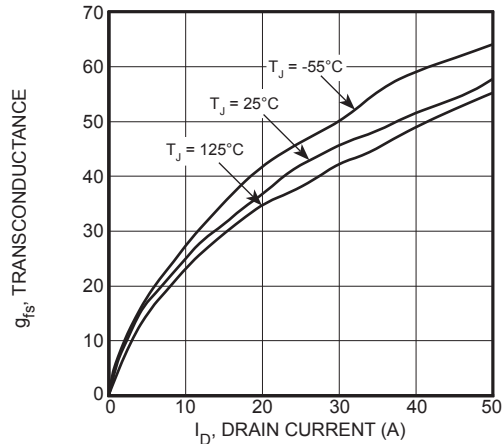


Figure 5, Gain vs Drain Current

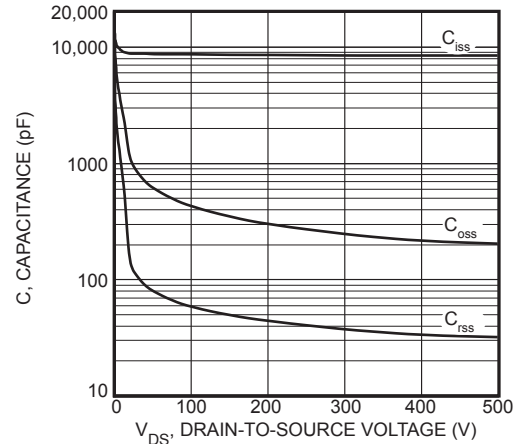


Figure 6, Capacitance vs Drain-to-Source Voltage

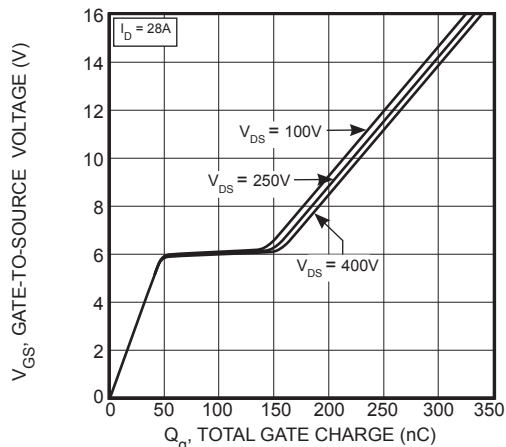


Figure 7, Gate Charge vs Gate-to-Source Voltage

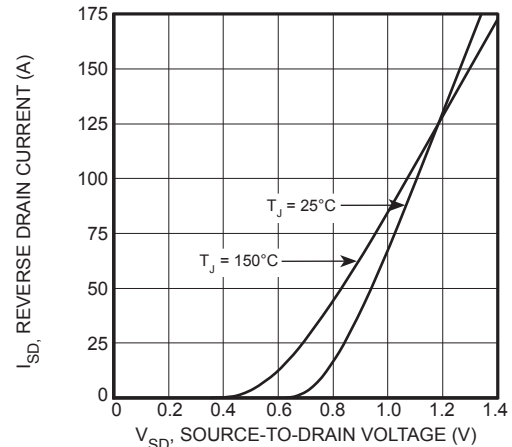
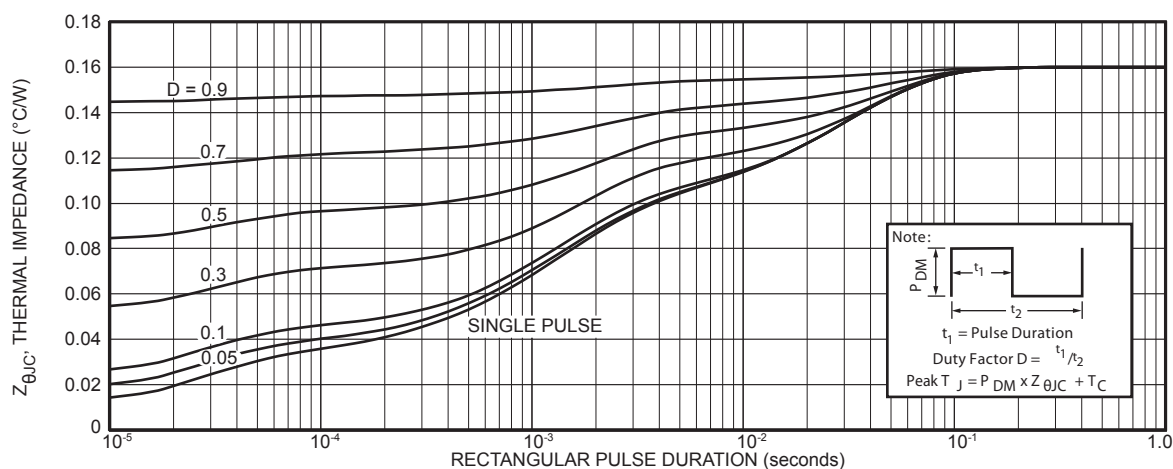
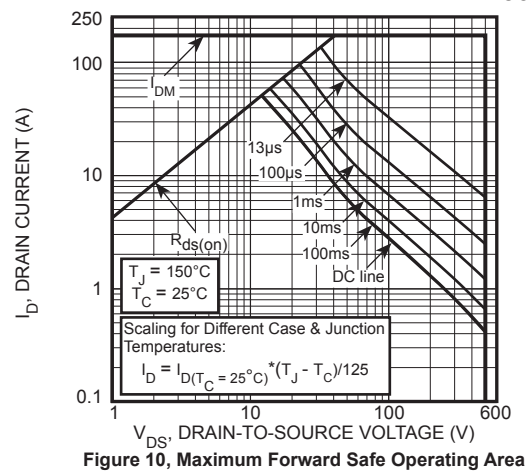
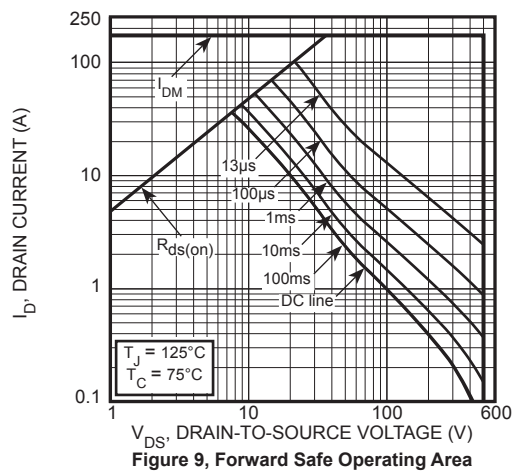
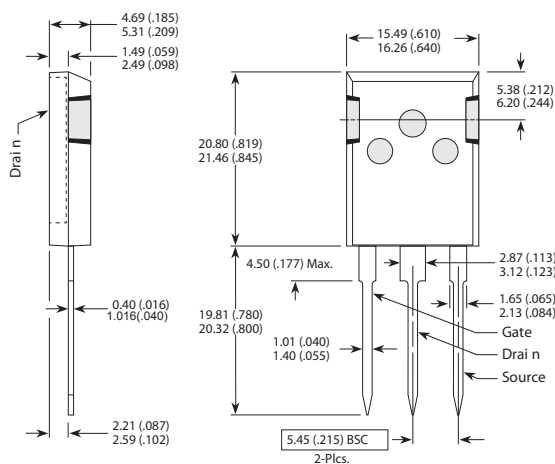


Figure 8, Reverse Drain Current vs Source-to-Drain Voltage



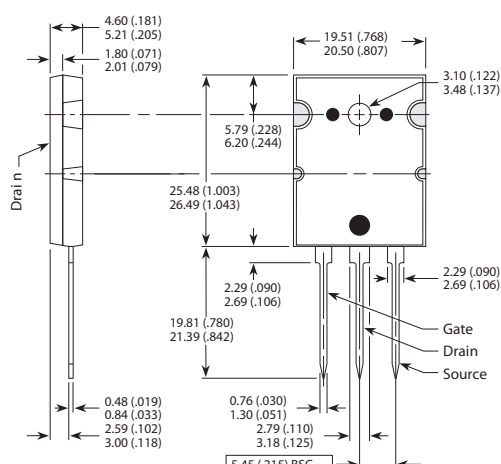
T-MAX® (B2) Package Outline

e3 100% Sn Plated



These dimensions are equal to the TO-247 without the mounting hole.
Dimensions in Millimeters and (Inches)

TO-264 (L) Package Outline



Dimensions in Millimeters and (Inches)