

Static Characteristics

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

APT14M120B_S

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{BR(DSS)}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	1200			V
$\Delta V_{BR(DSS)}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}, I_D = 250\mu A$		1.41		V/ $^\circ\text{C}$
$R_{DS(on)}$	Drain-Source On Resistance ^③	$V_{GS} = 10V, I_D = 7A$		0.87	1.10	Ω
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 1mA$	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	$V_{DS} = 1200V, T_J = 25^\circ\text{C}$ $V_{GS} = 0V, T_J = 125^\circ\text{C}$			100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 30V$			500	nA

Dynamic Characteristics

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
g_{fs}	Forward Transconductance	$V_{DS} = 50V, I_D = 7A$		15		S
C_{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1MHz$		4765		pF
C_{rss}	Reverse Transfer Capacitance			55		
C_{oss}	Output Capacitance			350		
$C_{o(cr)}^{④}$	Effective Output Capacitance, Charge Related	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 800V$		135		
$C_{o(er)}^{⑤}$	Effective Output Capacitance, Energy Related			70		
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 10V, I_D = 7A,$ $V_{DS} = 600V$		145		nC
Q_{gs}	Gate-Source Charge			24		
Q_{gd}	Gate-Drain Charge			70		
$t_{d(on)}$	Turn-On Delay Time	Resistive Switching $V_{DD} = 800V, I_D = 7A$ $R_G = 4.7\Omega^{⑥}, V_{GG} = 15V$		26		ns
t_r	Current Rise Time			15		
$t_{d(off)}$	Turn-Off Delay Time			85		
t_f	Current Fall Time			24		

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)			14	A
I_{SM}	Pulsed Source Current (Body Diode) ^①				51	
V_{SD}	Diode Forward Voltage	$I_{SD} = 7A, T_J = 25^\circ\text{C}, V_{GS} = 0V$			1.0	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 7A^{③}$ $di_{SD}/dt = 100A/\mu s, T_J = 25^\circ\text{C}$		1205		ns
Q_{rr}	Reverse Recovery Charge			23		μC
dv/dt	Peak Recovery dv/dt	$I_{SD} \leq 7A, di/dt \leq 1000A/\mu s, V_{DD} = 800V,$ $T_J = 125^\circ\text{C}$			10	V/ns

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

② Starting at $T_J = 25^\circ\text{C}$, $L = 43.59mH$, $R_G = 4.7\Omega$, $I_{AS} = 7A$.

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: $C_{o(er)} = -2.17E-7/V_{DS}^2 + 2.63E-8/V_{DS} + 3.74E-11$.

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.

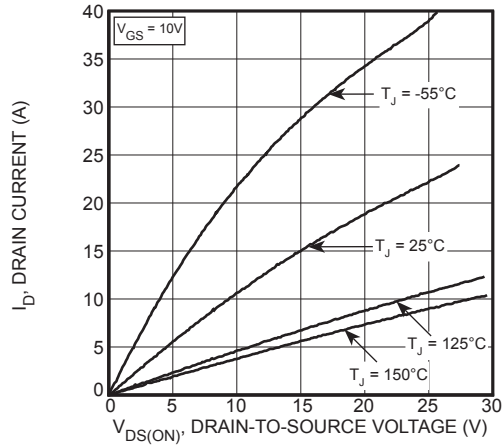


Figure 1, Output Characteristics

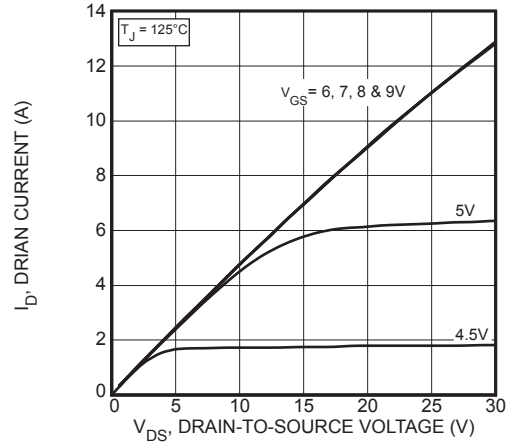


Figure 2, Output Characteristics

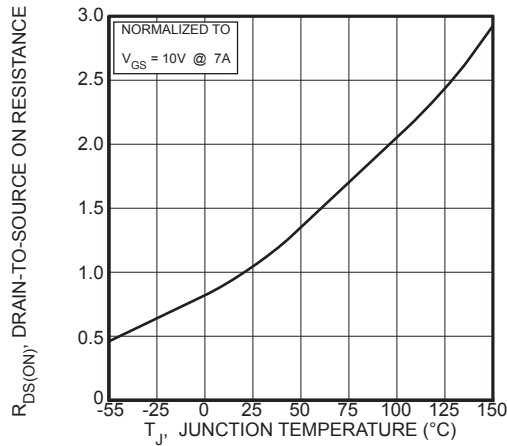


Figure 3, $R_{DS(ON)}$ vs Junction Temperature

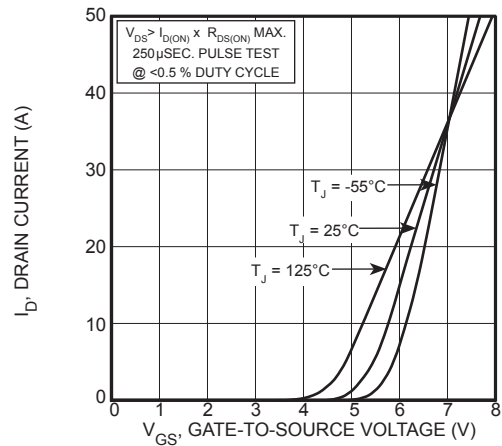


Figure 4, Transfer Characteristics

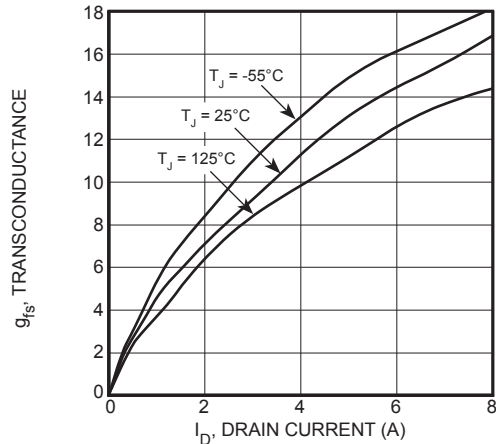


Figure 5, Gain vs Drain Current

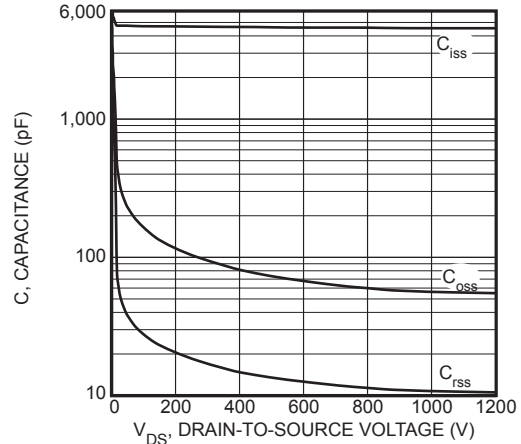


Figure 6, Capacitance vs Drain-to-Source Voltage

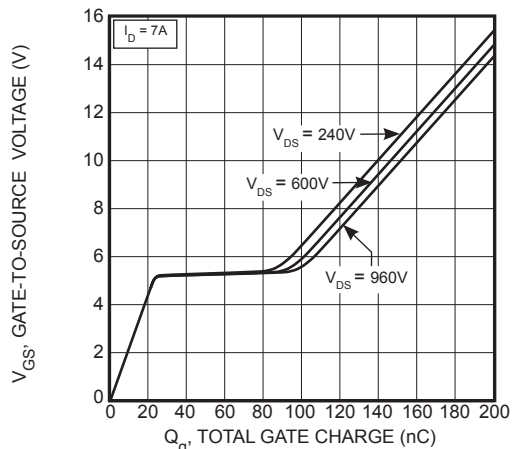


Figure 7, Gate Charge vs Gate-to-Source Voltage

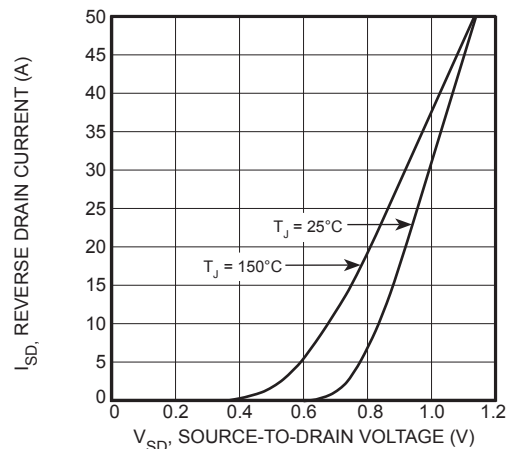


Figure 8, Reverse Drain Current vs Source-to-Drain Voltage

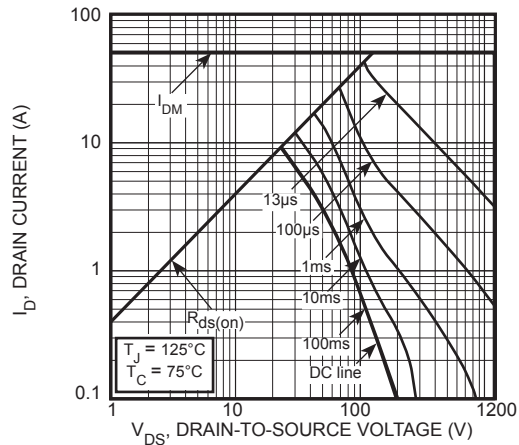


Figure 9, Forward Safe Operating Area

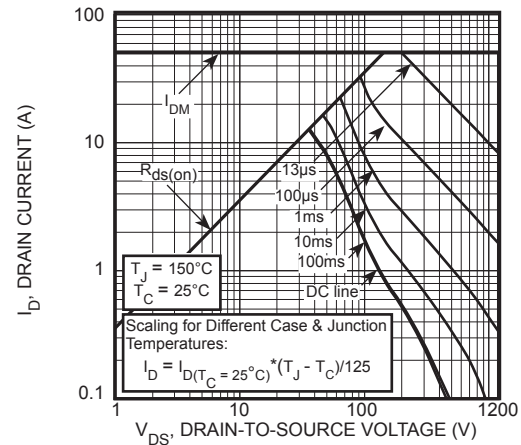


Figure 10, Maximum Forward Safe Operating Area

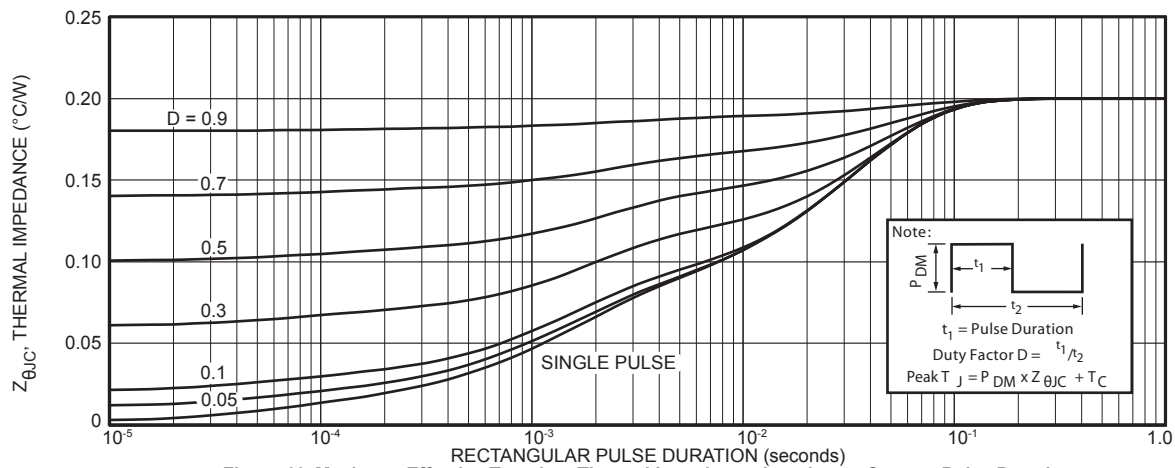
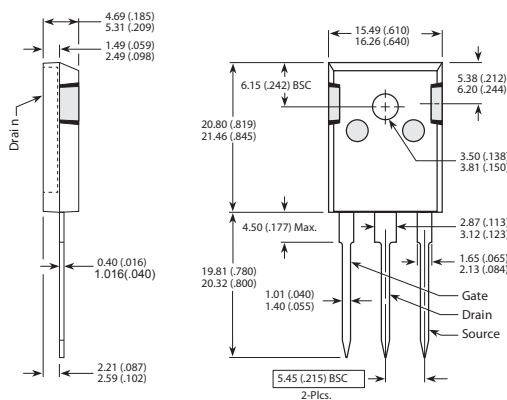


Figure 11. Maximum Effective Transient Thermal Impedance Junction-to-Case vs Pulse Duration

TO-247 (B) Package Outline

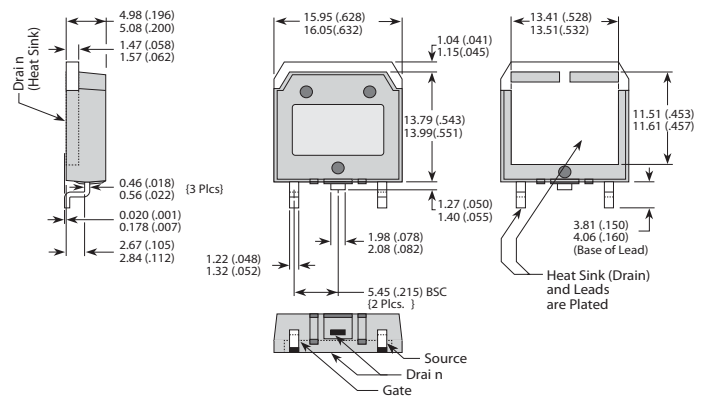
e1 SAC: Tin, Silver, Copper



Dimensions in Millimeters (Inches)

D³PAK Package Outline

e3 100% Sn Plated



Dimensions in Millimeters (Inches)