

Static Characteristics

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

APT13F120B_S

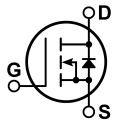
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{BR(DSS)}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	1200			V
$\Delta V_{BR(DSS)}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25°C , $I_D = 250\mu A$		1.41		V/ $^{\circ}\text{C}$
$R_{DS(on)}$	Drain-Source On Resistance ^③	$V_{GS} = 10V, I_D = 7A$		.91	1.2	Ω
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 1mA$	2.5	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	$V_{DS} = 1200V, T_J = 25^{\circ}\text{C}$ $V_{GS} = 0V, T_J = 125^{\circ}\text{C}$			250 1000	μA
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	$V_{DS} = 50V, I_D = 7A$		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				50	
V_{SD}	Diode Forward Voltage	$I_{SD} = 7A, T_J = 25^{\circ}\text{C}, V_{GS} = 0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 7A^{③}$ $di_{SD}/dt = 100A/\mu s$ $V_{DD} = 100V$	$T_J = 25^{\circ}\text{C}$		250	ns
			$T_J = 125^{\circ}\text{C}$		520	
Q_{rr}	Reverse Recovery Charge		$T_J = 25^{\circ}\text{C}$	1.12		μC
			$T_J = 125^{\circ}\text{C}$	3.03		
I_{rrm}	Reverse Recovery Current		$T_J = 25^{\circ}\text{C}$	10		A
			$T_J = 125^{\circ}\text{C}$	13.5		
dv/dt	Peak Recovery dv/dt	$I_{SD} \leq 7A, di/dt \leq 1000A/\mu s, V_{DD} = 800V,$ $T_J = 125^{\circ}\text{C}$			25	V/ns

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

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

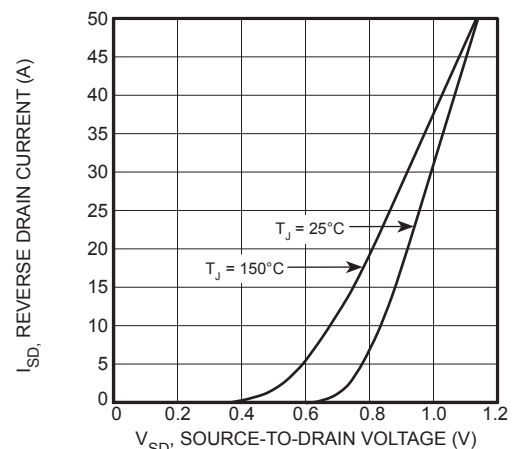
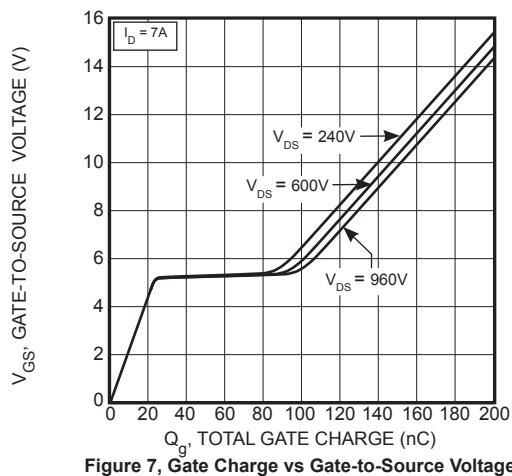
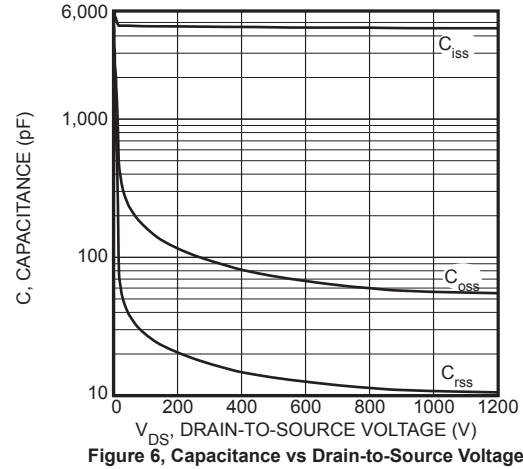
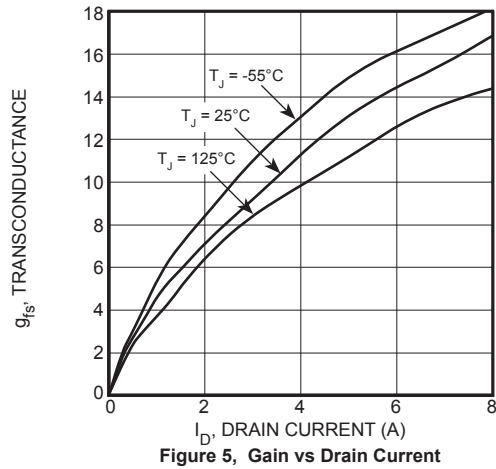
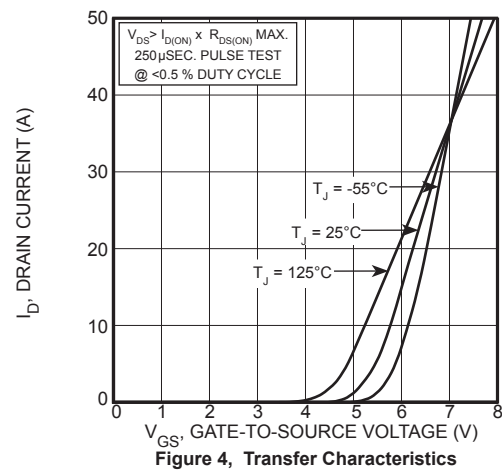
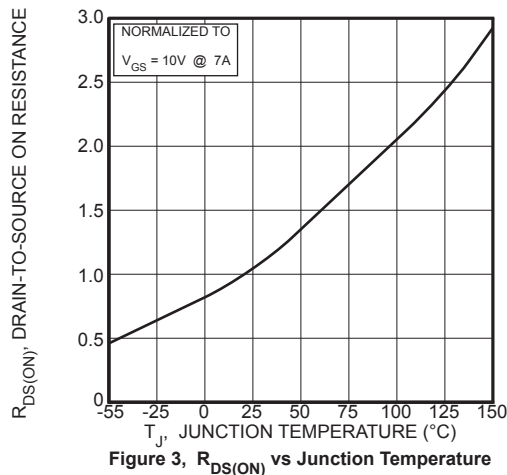
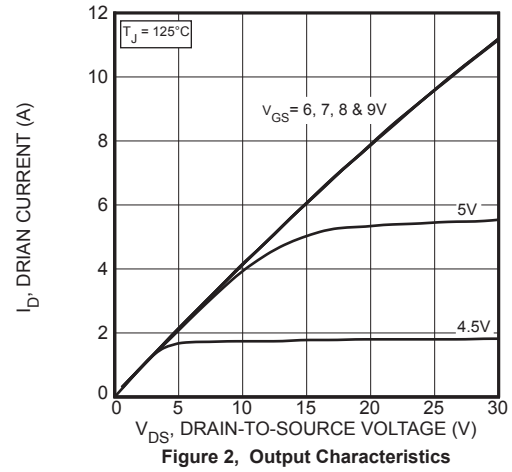
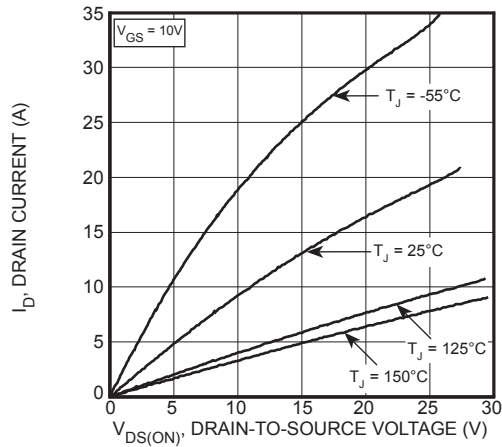
③ Pulse test: Pulse Width < 380 μs , duty cycle < 2%.

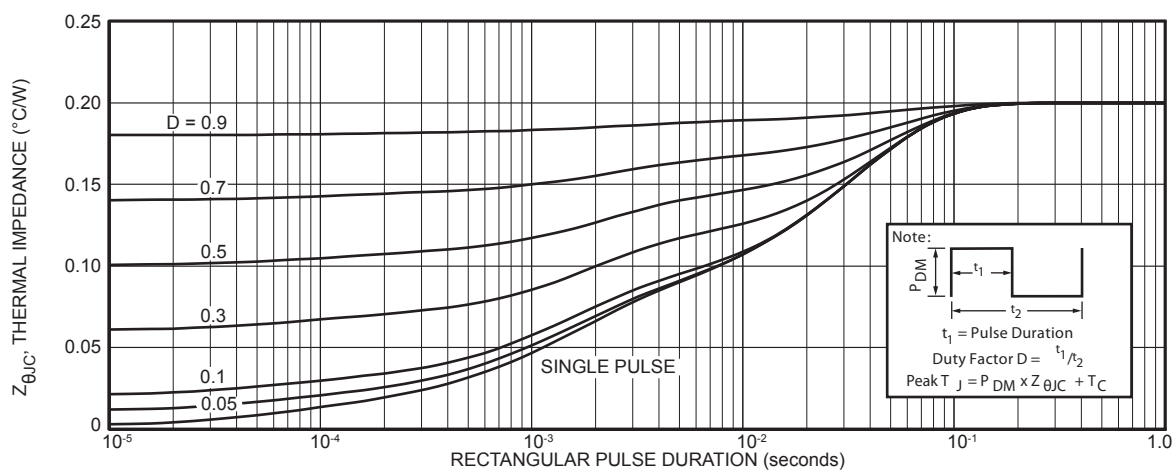
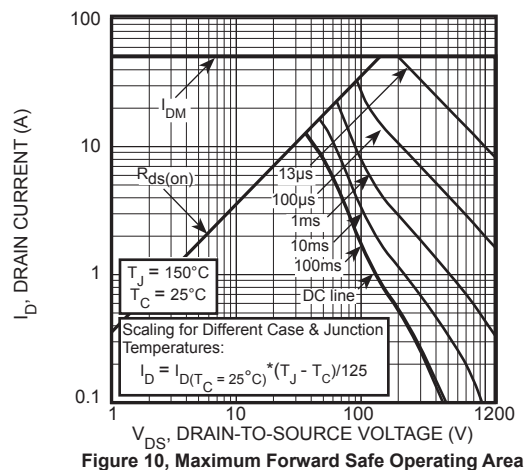
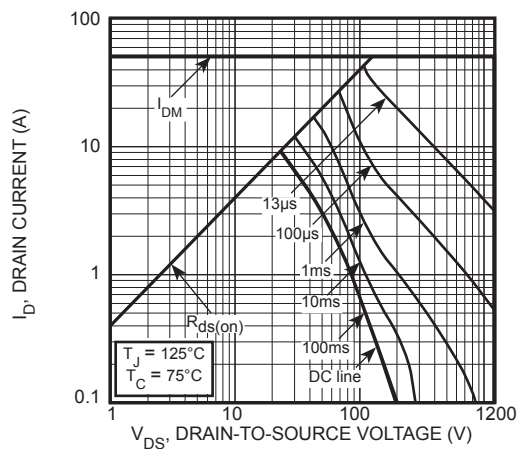
④ $C_{o(cr)}$ is defined as a fixed capacitance with the same stored charge as C_{OSS} with $V_{DS} = 67\%$ of $V_{(BR)DSS}$.

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)

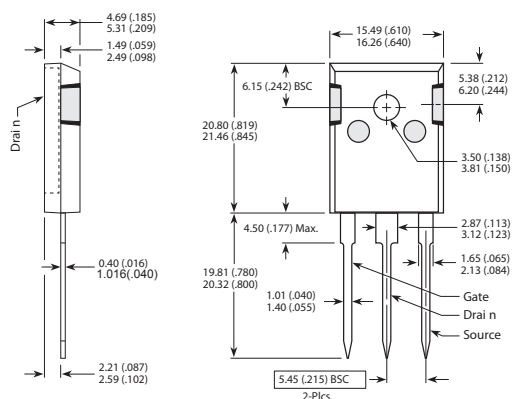
Microsemi reserves the right to change, without notice, the specifications and information contained herein.





TO-247 (B) Package Outline

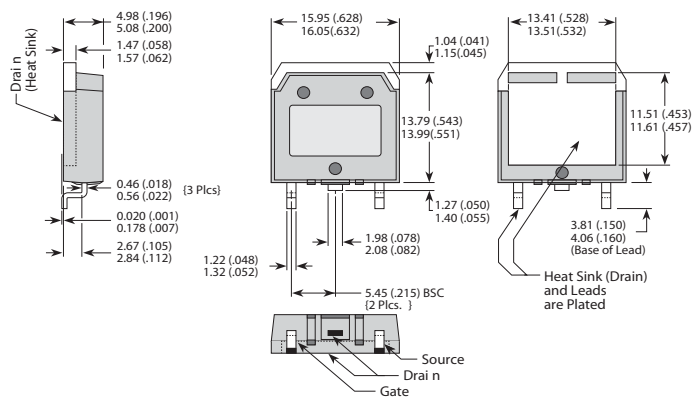
(e1) SAC: Tin, Silver, Copper



Dimensions in Millimeters (Inches)

D³PAK Package Outline

(e3) 100% Sn Plated



Dimensions in Millimeters (Inches)