

Static Characteristics

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

APT6M100K

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{BR(DSS)}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	1000			V
$\Delta V_{BR(DSS)}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}, I_D = 250\mu A$		1.15		V/°C
$R_{DS(on)}$	Drain-Source On Resistance ^③	$V_{GS} = 10V, I_D = 3A$		2.05	2.50	Ω
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 0.5mA$	3	4	5	V
$\Delta V_{GS(th)}/\Delta T_J$	Threshold Voltage Temperature Coefficient			-10		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 1000V, T_J = 25^\circ\text{C}$ $V_{GS} = 0V, T_J = 125^\circ\text{C}$			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	$V_{DS} = 50V, I_D = 3A$		5.6		S
C_{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1MHz$		1410		pF
C_{rss}	Reverse Transfer Capacitance			19		
C_{oss}	Output Capacitance			120		
$C_{o(cr)}^{④}$	Effective Output Capacitance, Charge Related	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 667V$		48		
$C_{o(er)}^{⑤}$	Effective Output Capacitance, Energy Related			25		
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 10V, I_D = 3A,$ $V_{DS} = 500V$		43		nC
Q_{gs}	Gate-Source Charge			8		
Q_{gd}	Gate-Drain Charge			21		
$t_{d(on)}$	Turn-On Delay Time	Resistive Switching $V_{DD} = 667V, I_D = 3A$ $R_G = 10\Omega^{⑥}, V_{GG} = 15V$		6.4		ns
t_r	Current Rise Time			5.8		
$t_{d(off)}$	Turn-Off Delay Time			22		
t_f	Current Fall Time			5.4		

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)			6	A
I_{SM}	Pulsed Source Current (Body Diode) ^①				20	
V_{SD}	Diode Forward Voltage	$I_{SD} = 3A, T_J = 25^\circ\text{C}, V_{GS} = 0V$			1.3	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 3A, V_{DD} = 100V^{②}$ $di_{SD}/dt = 100A/\mu s, T_J = 25^\circ\text{C}$		1025		ns
Q_{rr}	Reverse Recovery Charge			17		μC
dv/dt	Peak Recovery dv/dt	$I_{SD} \leq 3A, di/dt \leq 1000A/\mu s, V_{DD} = 667V,$ $T_J = 125^\circ\text{C}$			10	V/ns

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

② Starting at $T_J = 25^\circ\text{C}, L = 68.89mH, R_G = 25\Omega, I_{AS} = 3A$.

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: $C_{o(er)} = -4.09E-8/V_{DS}^2 + 7.21E-9/V_{DS} + 1.40E-11$.

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.

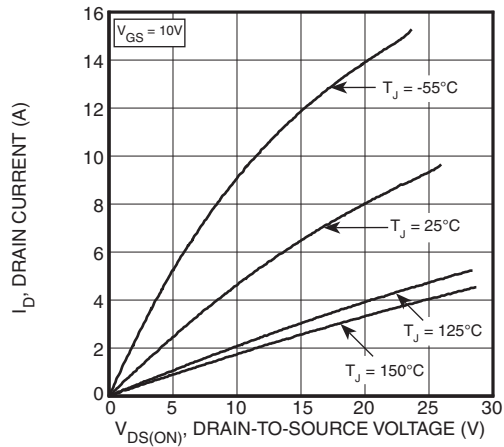


Figure 1, Output Characteristics

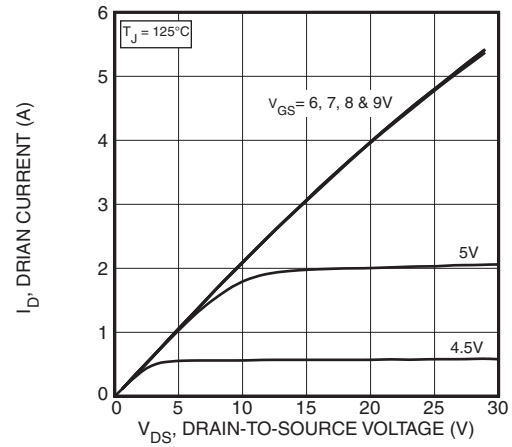


Figure 2, Output Characteristics

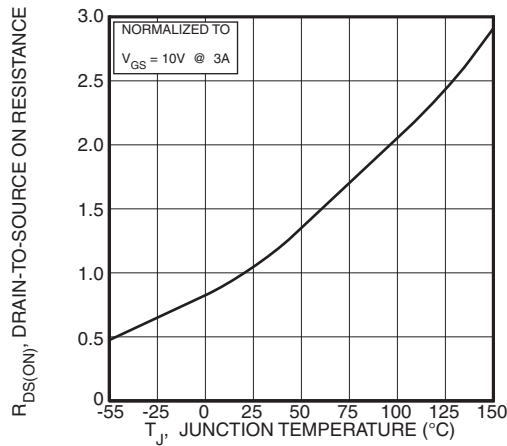
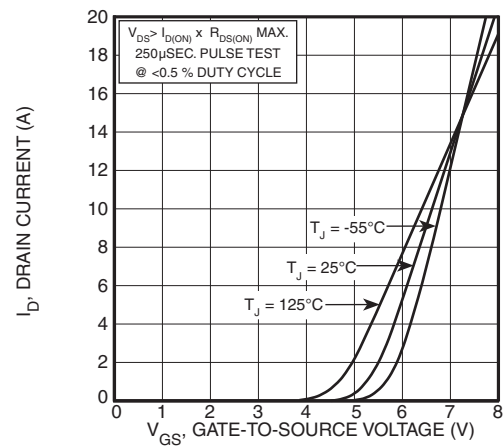
Figure 3, $R_{DS(ON)}$ vs Junction Temperature

Figure 4, Transfer Characteristics

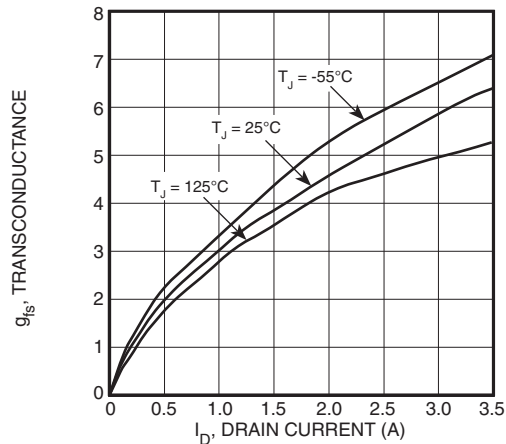


Figure 5, Gain vs Drain Current

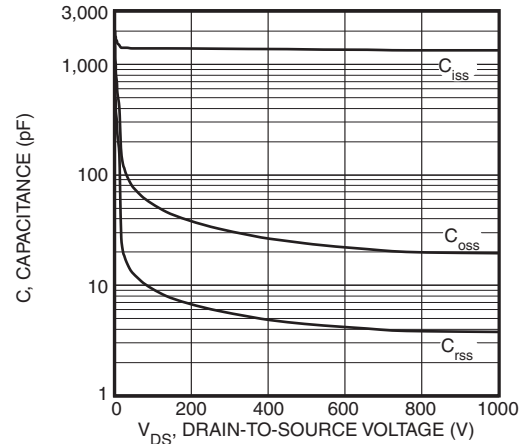


Figure 6, Capacitance vs Drain-to-Source Voltage

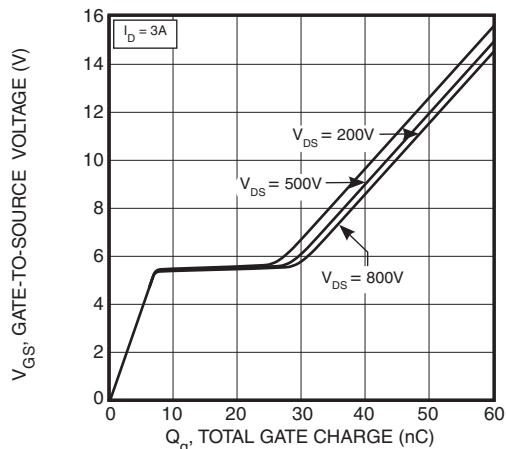


Figure 7, Gate Charge vs Gate-to-Source Voltage

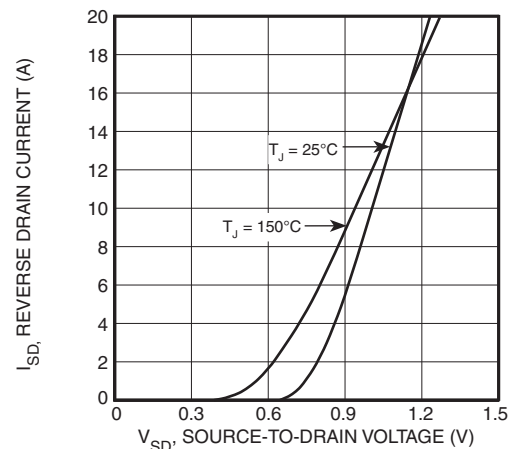
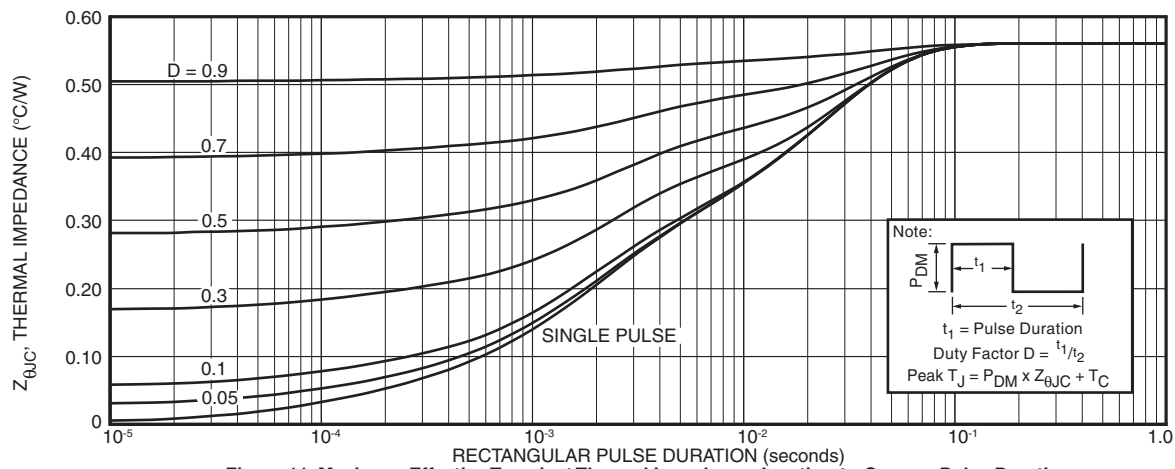
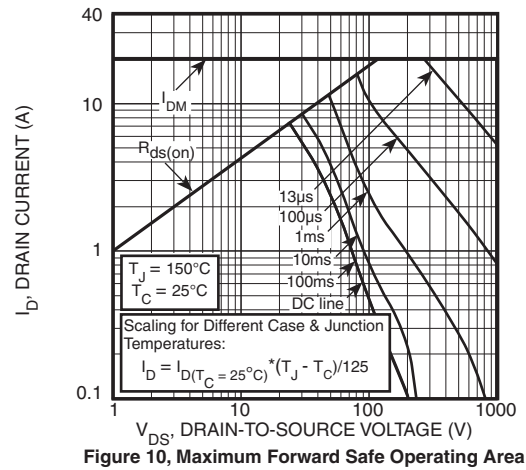
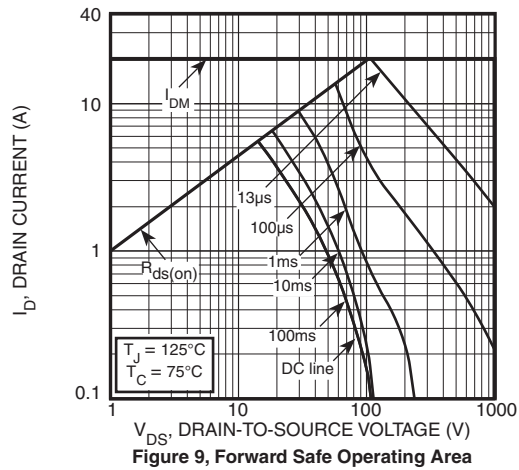


Figure 8, Reverse Drain Current vs Source-to-Drain Voltage



TO-220 (K) Package Outline

ⓔ3 100% Sn Plated

