

Static Characteristics
T_J = 25°C unless otherwise specified
APT38F80B2_L

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _{BR(DSS)}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	800			V
ΔV _{BR(DSS)} /ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D = 250μA		0.87		V/°C
R _{DS(on)}	Drain-Source On Resistance ^③	V _{GS} = 10V, I _D = 20A		0.19	0.24	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} = 800V V _{GS} = 0V			250	μA
		T _J = 25°C T _J = 125°C			1000	
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 = 20A		38		S
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V f = 1MHz		8070		pF
C _{rss}	Reverse Transfer Capacitance			140		
C _{oss}	Output Capacitance			805		
C _{o(cr)} ^④	Effective Output Capacitance, Charge Related	V _{GS} = 0V, V _{DS} = 0V to 533V		380		
C _{o(er)} ^⑤	Effective Output Capacitance, Energy Related			190		
Q _g	Total Gate Charge	V _{GS} = 0 to 10V, I _D = 20A, V _{DS} = 400V		260		nC
Q _{gs}	Gate-Source Charge			44		
Q _{gd}	Gate-Drain Charge			135		
t _{d(on)}	Turn-On Delay Time	Resistive Switching V _{DD} = 533V, I _D = 20A R _G = 2.2Ω ^⑥ , V _{GG} = 15V		46		ns
t _r	Current Rise Time			65		
t _{d(off)}	Turn-Off Delay Time			200		
t _f	Current Fall Time			60		

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)			41	A
I _{SM}	Pulsed Source Current (Body Diode) ^①				150	
V _{SD}	Diode Forward Voltage	I _{SD} = 20A, T _J = 25°C, V _{GS} = 0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} = 20A ^③ V _{DD} = 100V di _{SD} /dt = 100A/μs	T _J = 25°C	250	300	ns
			T _J = 125°C	485	600	
Q _{rr}	Reverse Recovery Charge		T _J = 25°C	2		μC
			T _J = 125°C	6.7		
I _{rrm}	Reverse Recovery Current		T _J = 25°C	13		A
			T _J = 125°C	22		
dv/dt	Peak Recovery dv/dt	I _{SD} ≤ 20A, di/dt ≤ 1000A/μs, V _{DD} = 533V, 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 = 8.55mH, R_G = 25Ω, I_{AS} = 20A.

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)} = -2.17E-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.

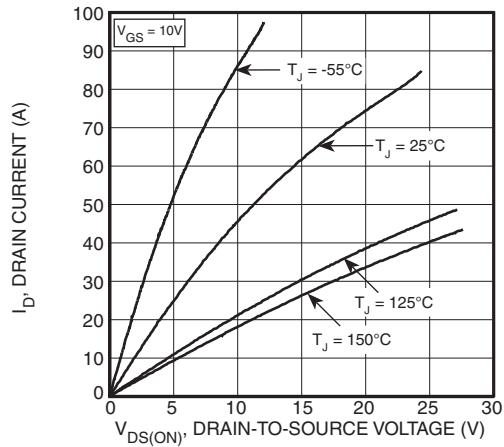


Figure 1, Output Characteristics

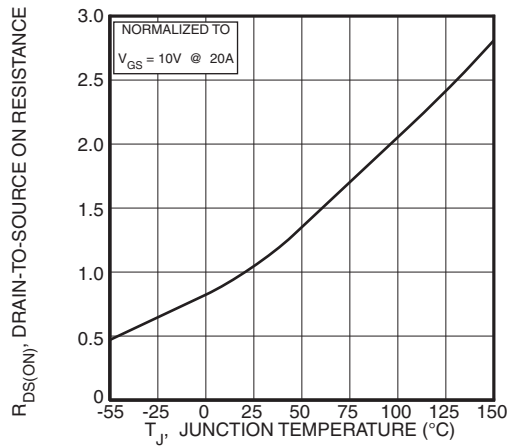
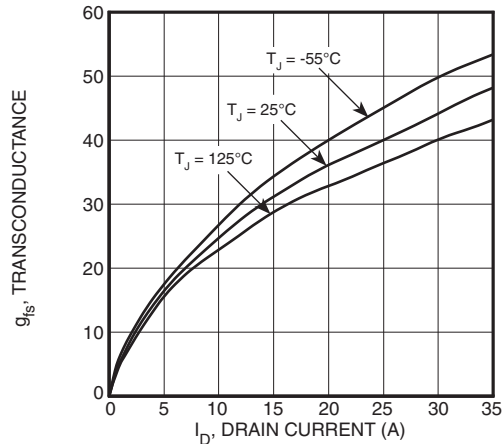
Figure 3, $R_{DS(ON)}$ vs Junction Temperature

Figure 5, Gain vs Drain Current

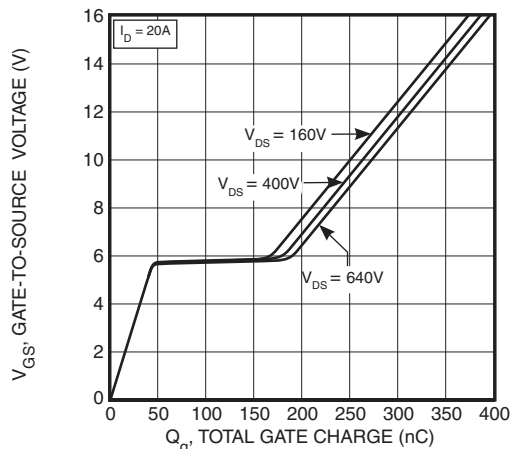


Figure 7, Gate Charge vs Gate-to-Source Voltage

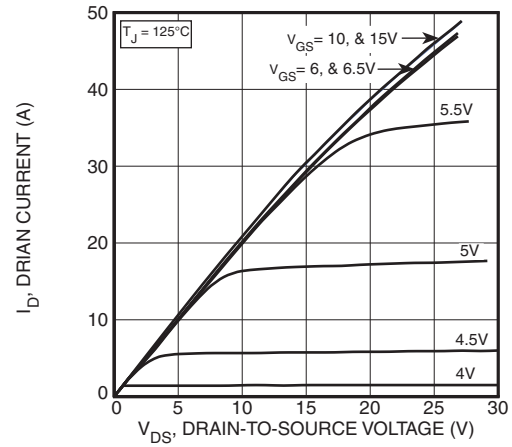


Figure 2, Output Characteristics

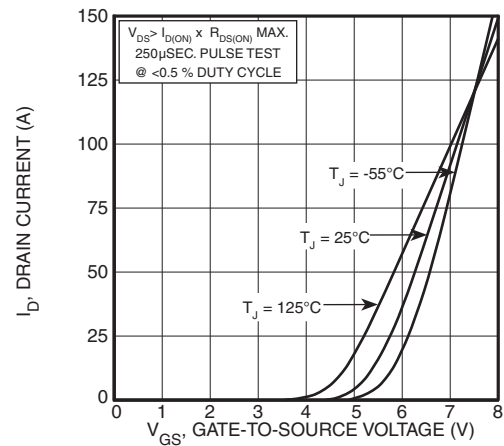


Figure 4, Transfer Characteristics

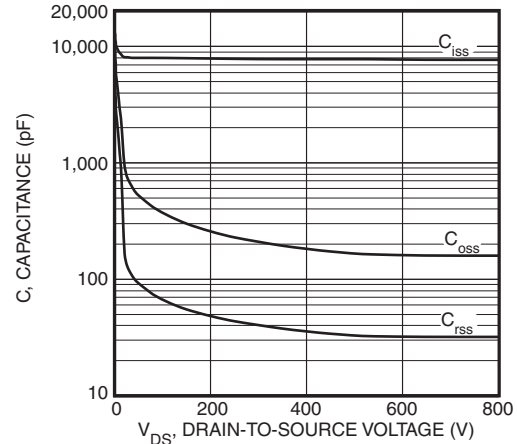


Figure 6, Capacitance vs Drain-to-Source Voltage

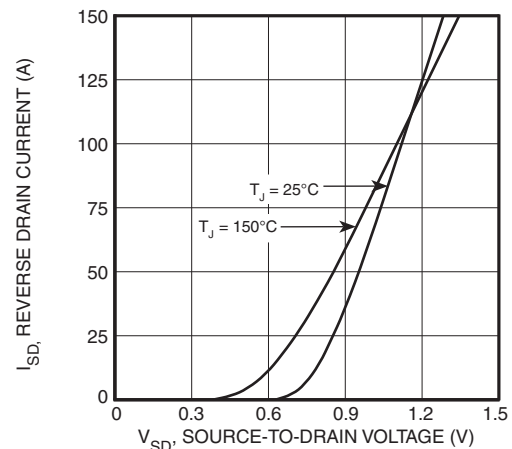


Figure 8, Reverse Drain Current vs Source-to-Drain Voltage

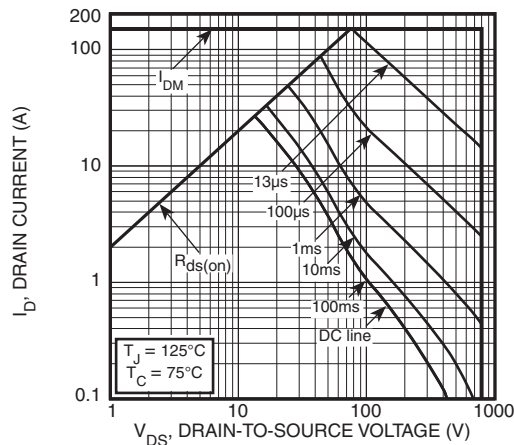


Figure 9, Forward Safe Operating Area

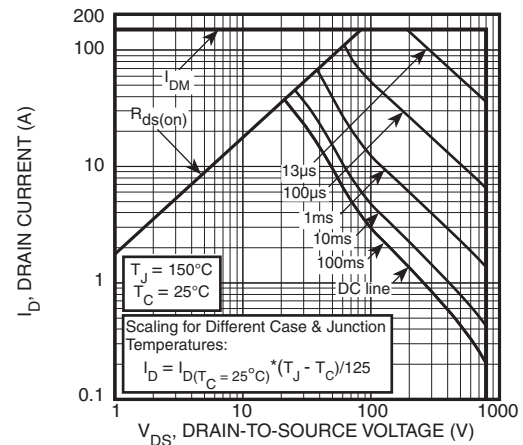


Figure 10, Maximum Forward Safe Operating Area

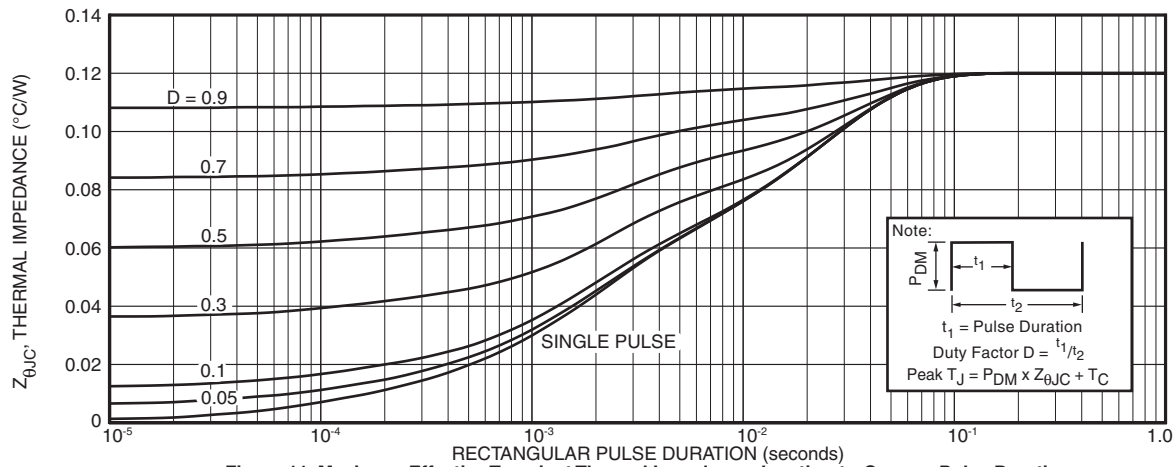


Figure 11. Maximum Effective Transient Thermal Impedance Junction-to-Case vs Pulse Duration

T-MAX[®] (B2) Package Outline

TO-264 (L) Package Outline

e3 100% Sn Plated

