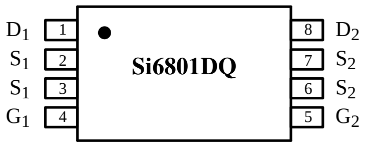
Dual Enhancement-Mode MOSFET (N- and P-Channel)

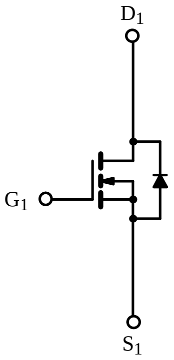
Product Summary

	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.160 @ V_{GS} = 4.5 V	± 1.9
		0.260 @ V_{GS} = 3.0 V	± 1.5
P-Channel	–20	0.190 @ V_{GS} = –4.5 V	± 1.7
		0.280 @ V_{GS} = –3.0 V	± 1.3

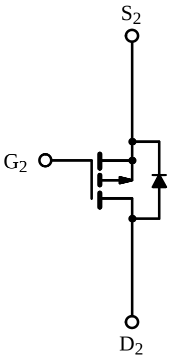
TSSOP-8



Top View



N-Channel MOSFET



P-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	20	–20	V
Gate-Source Voltage		V_{GS}	± 12		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	± 1.9	± 1.7	A
	T_A = 70°C		± 1.5	± 1.3	
Pulsed Drain Current		I_{DM}	± 8		
Continuous Source Current (Diode Conduction)[a]		I_S	1.0	–1.0	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.0		W
	T_A = 70°C		0.64		
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150		°C

Thermal Resistance Ratings

Parameter	Symbol	N- or P-Channel	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	125	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

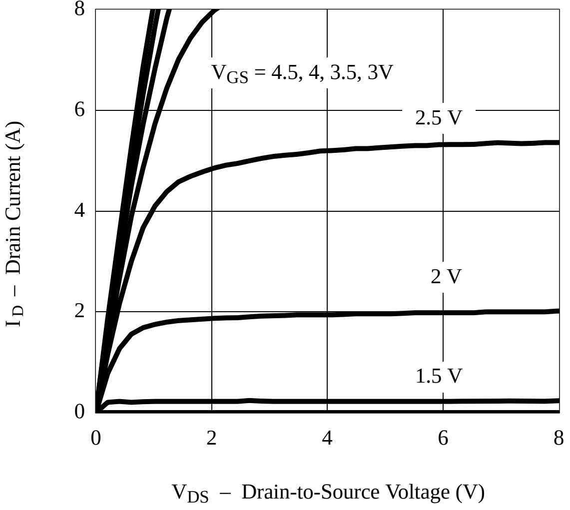
Specifications (T_J = 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 µA	N-Ch	0.6			V
		$V_{DS} = V_{GS}$, I_D = –250 µA	P-Ch	–0.6			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V	N-Ch			± 100	nA
			P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	N-Ch			1	µA
		V_{DS} = –20 V, V_{GS} = 0 V	P-Ch			–1	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 70°C	N-Ch			25	
		V_{DS} = –20 V, V_{GS} = 0 V, T_J = 70°C	P-Ch			–25	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 4.5 V	N-Ch	6			A
		V_{DS} = –5 V, V_{GS} = –4.5 V	P-Ch	–6			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 1.9 A	N-Ch		0.120	0.160	Ω
		V_{GS} = –4.5 V, I_D = 1.7 A	P-Ch		0.155	0.190	
		V_{GS} = 3.0 V, I_D = 1.5 A	N-Ch		0.160	0.260	
		V_{GS} = –3.0 V, I_D = 1.3 A	P-Ch		0.210	0.280	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 1.9 A	N-Ch		5.4		S
		V_{DS} = –15 V, I_D = –1.7 A	P-Ch		4.0		
Diode Forward Voltage[a]	V_{SD}	I_S = 1.0 A, V_{GS} = 0 V	N-Ch		0.77	1.2	V
		I_S = –1.0 A, V_{GS} = 0 V	P-Ch		–0.77	–1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 3.5 V, V_{GS} = 4.5 V, I_D = 0.3 A P-Channel V_{DS} = –3.5 V, V_{GS} = –4.5 V I_D = –0.3 A	N-Ch		1.7	3.5	nC
			P-Ch		3.5	7.0	
Gate-Source Charge	Q_{gs}		N-Ch		0.26		
			P-Ch		0.76		
Gate-Drain Charge	Q_{gd}		N-Ch		0.41		
			P-Ch		0.70		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 3.5 V, R_L = 11.5 Ω I_D ≅ 0.3 A, V_{GEN} = 4.5 V, R_G = 6 Ω P-Channel V_{DD} = –3.5 V, R_L = 11.5 Ω I_D ≅ –0.3 A, V_{GEN} = –4.5 V, R_G = 6 Ω	N-Ch		7.3	15	ns
			P-Ch		6.0	15	
Rise Time	t_r		N-Ch		10.0	20.0	
			P-Ch		10.0	20.0	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		11.0	20.0	
			P-Ch		10.0	20.0	
Fall Time	t_f		N-Ch		6.0	15	
			P-Ch		7.0	15	
Source-Drain Reverse Recovery Time	t_{rr}	N-Channel—I_F = 1.0 A, di/dt = 100 A/µs	N-Ch		31	60	
		P-Channel—I_F = –1.0 A, di/dt = 100 A/µs	P-Ch		35	60	

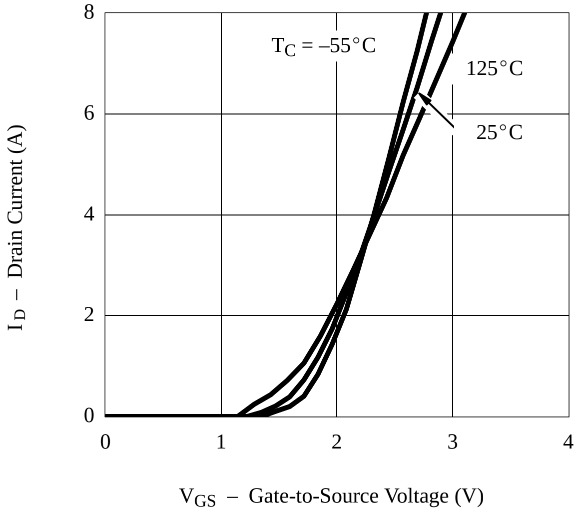
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

Typical Characteristics (25°C Unless Noted) N-Channel

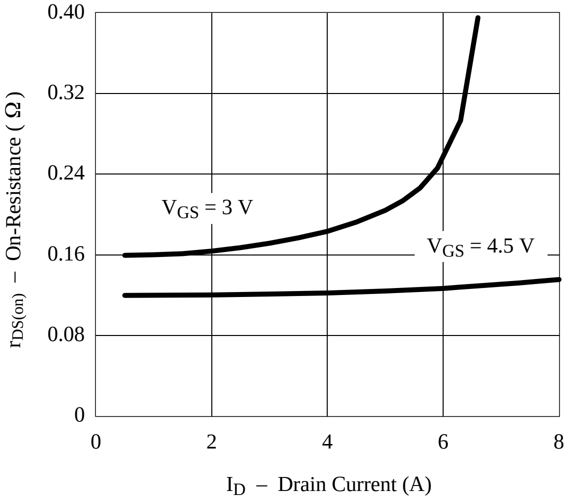
Output Characteristics



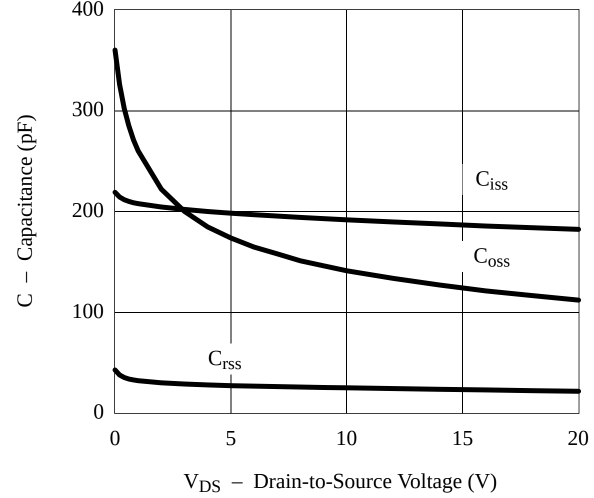
Transfer Characteristics



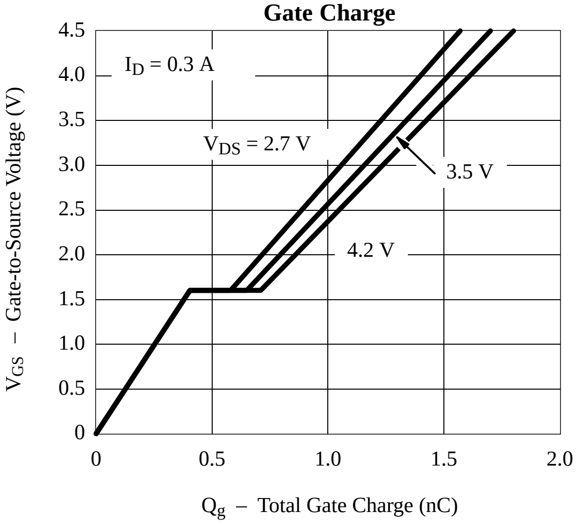
On-Resistance vs. Drain Current



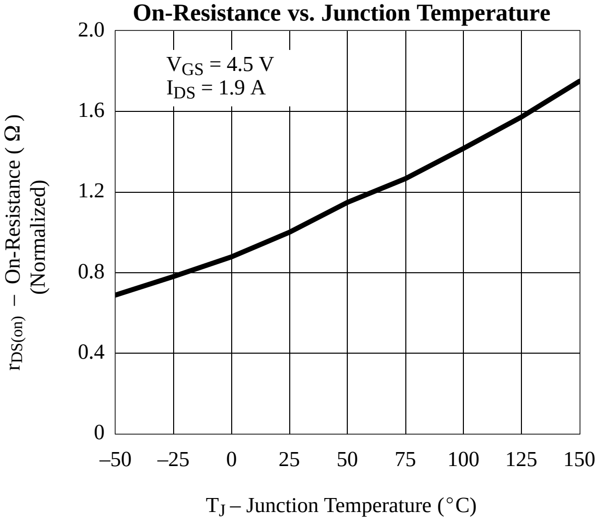
Capacitance



Gate Charge

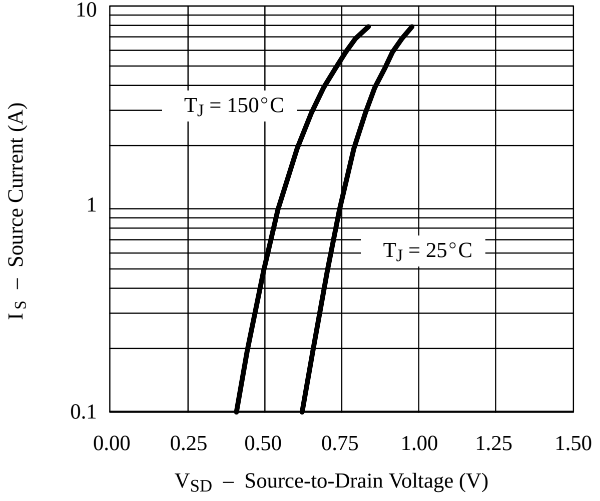


On-Resistance vs. Junction Temperature

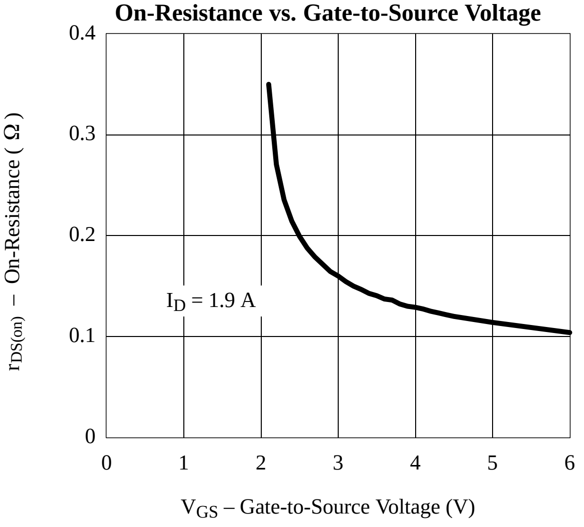


New Product

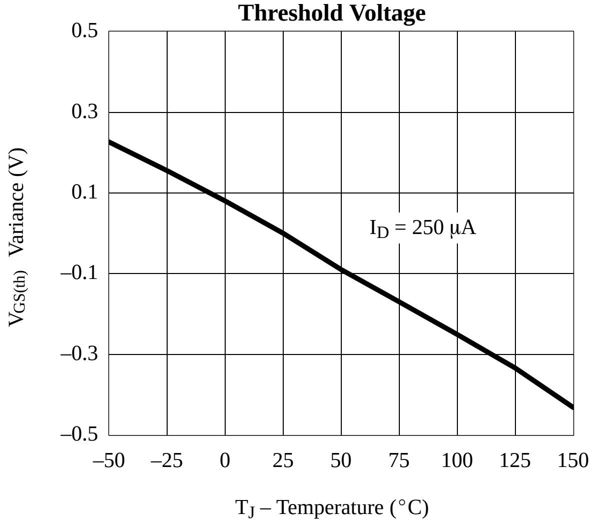
Typical Characteristics (25°C Unless Noted) N-Channel



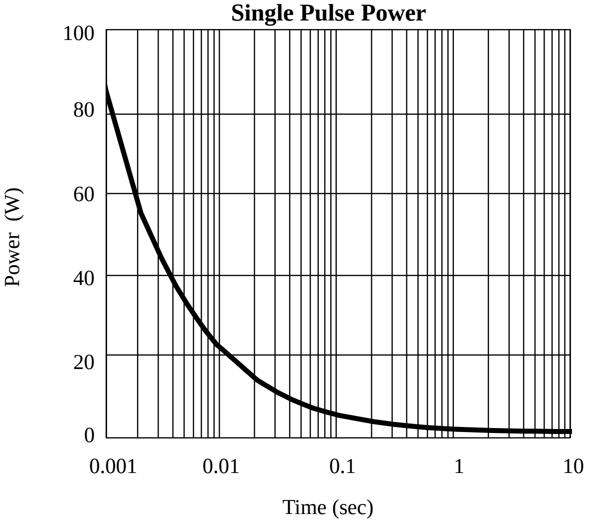
Source-Drain Diode Forward Voltage



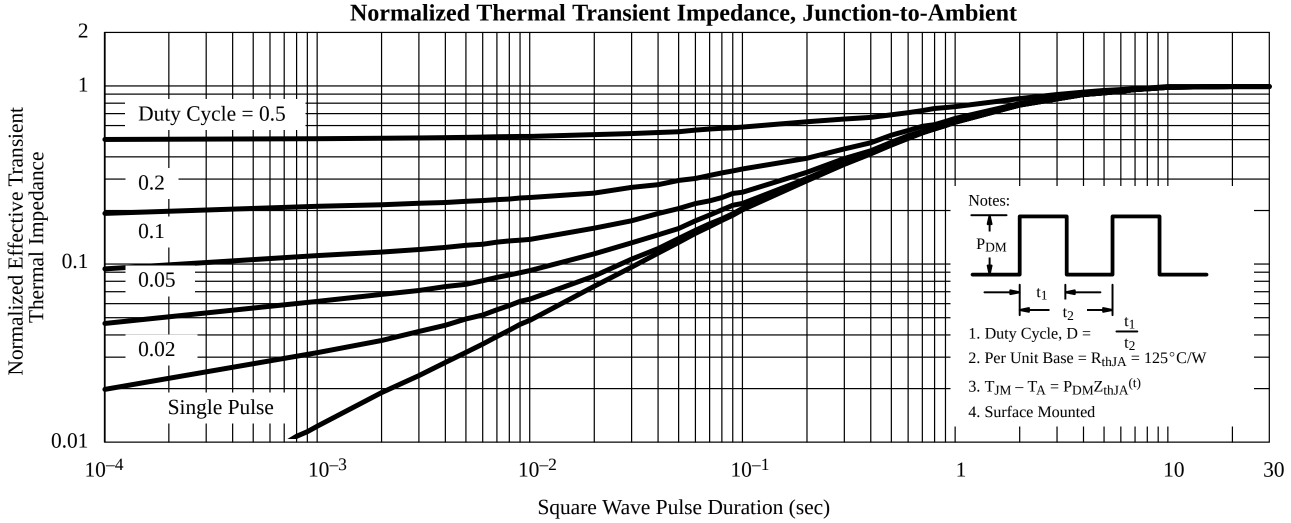
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



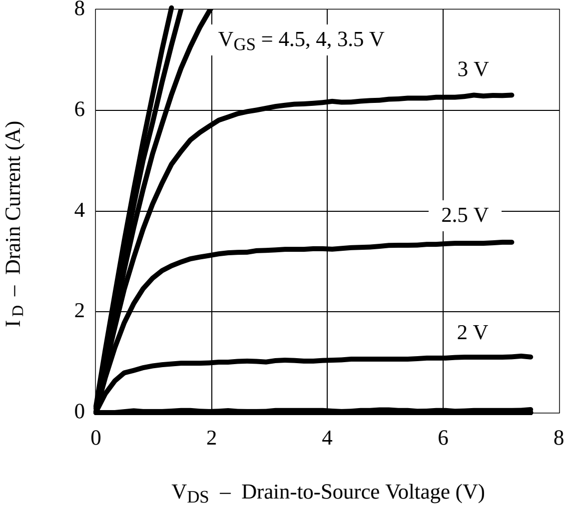
Single Pulse Power



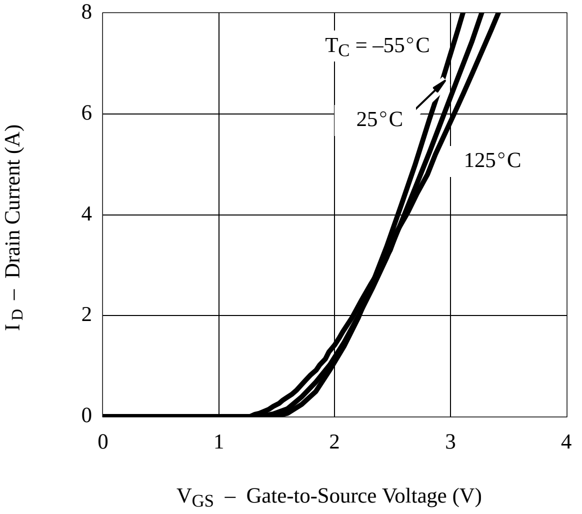
Normalized Thermal Transient Impedance, Junction-to-Ambient

Typical Characteristics (25°C Unless Noted) P-Channel

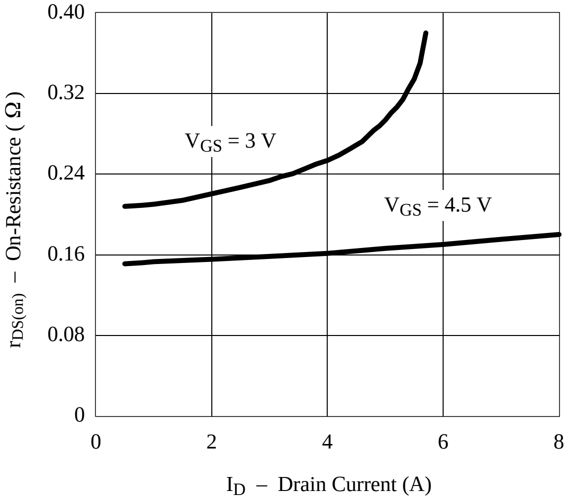
Output Characteristics



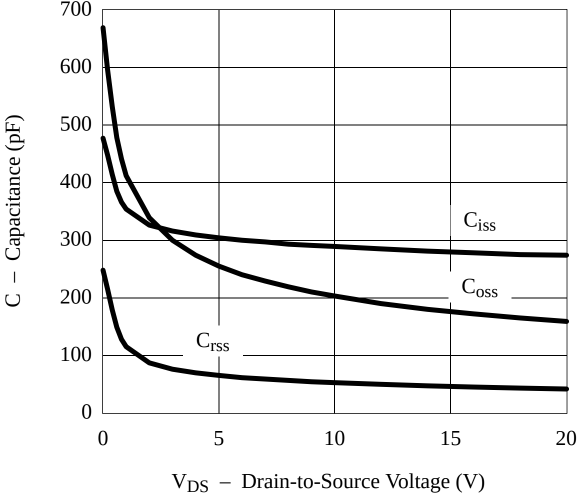
Transfer Characteristics



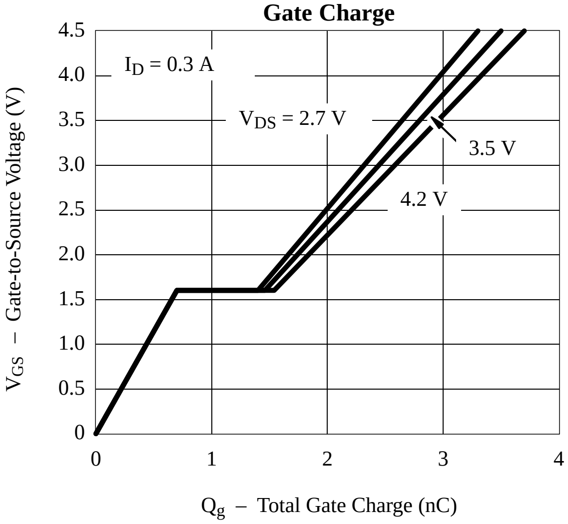
On-Resistance vs. Drain Current



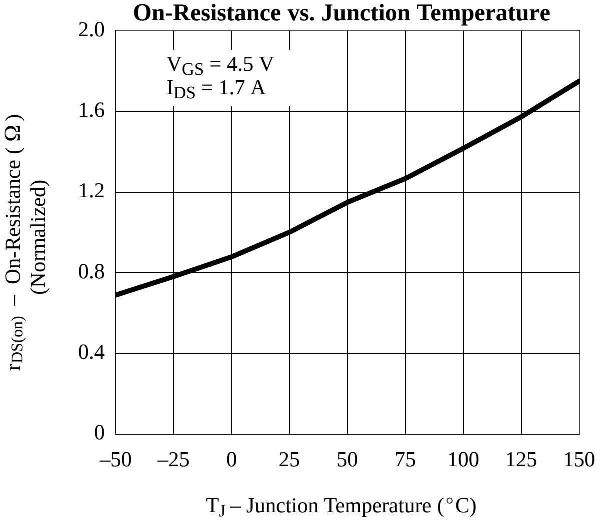
Capacitance



Gate Charge

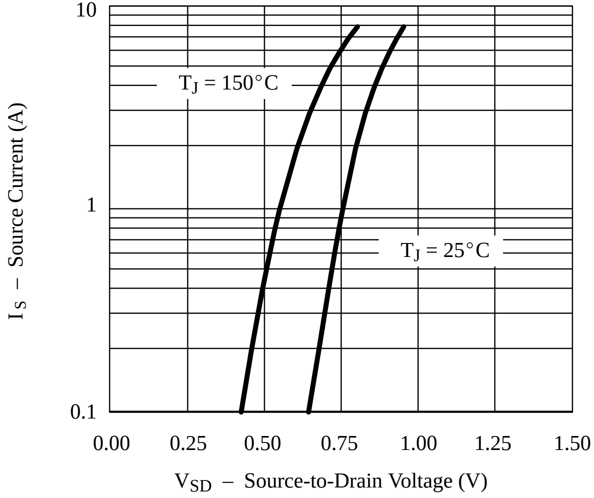


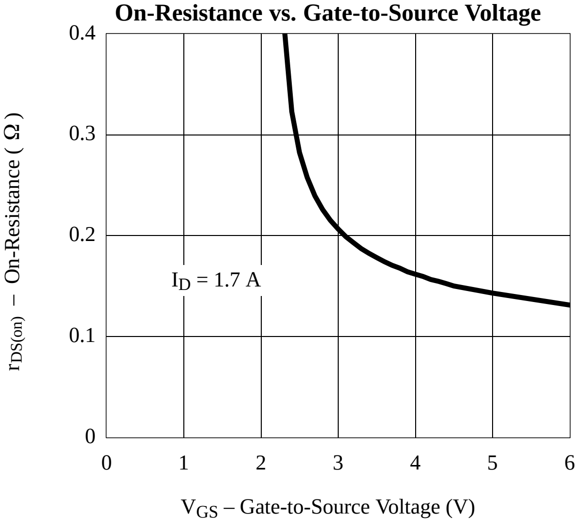
On-Resistance vs. Junction Temperature

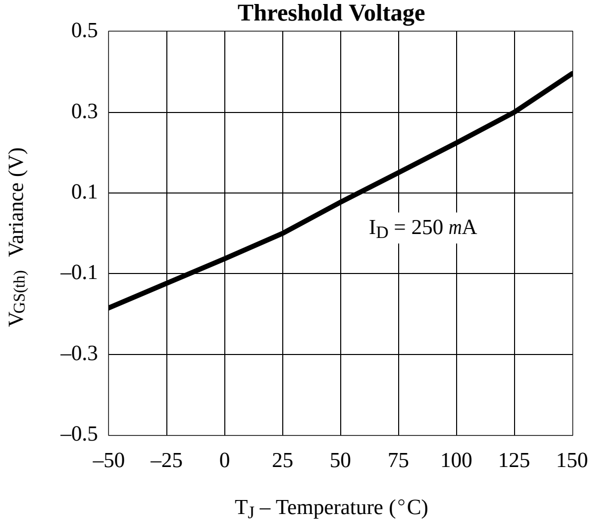


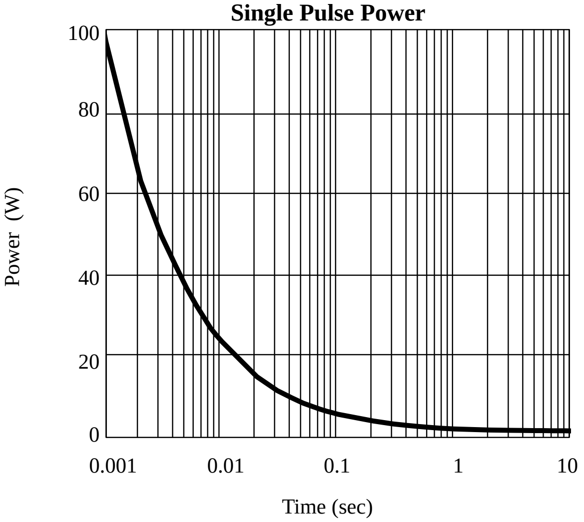
New Product

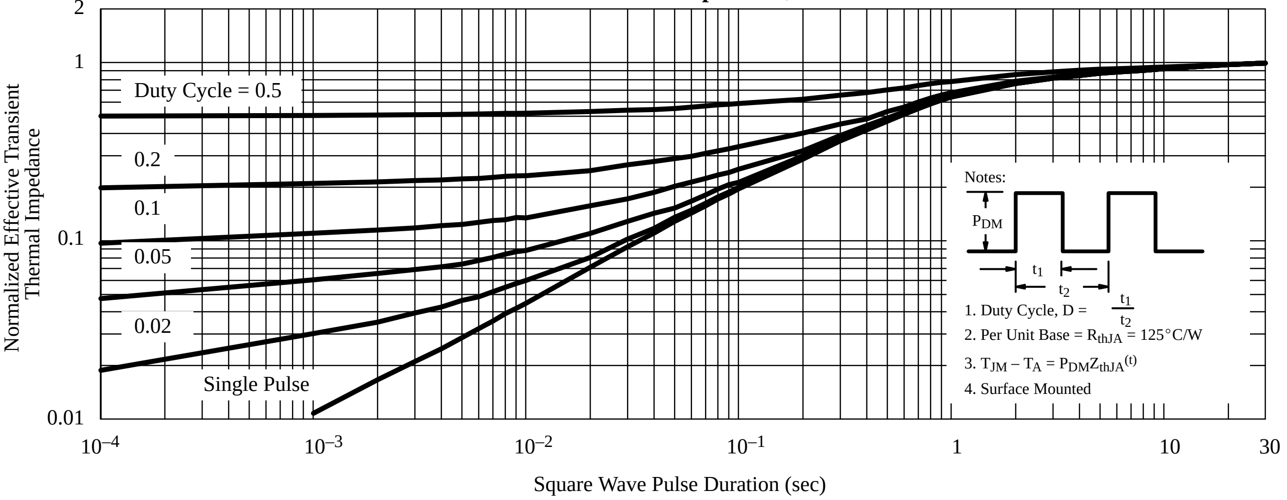
Typical Characteristics (25°C Unless Noted) P-Channel


Source-Drain Diode Forward Voltage


On-Resistance vs. Gate-to-Source Voltage


Threshold Voltage


Single Pulse Power


Normalized Thermal Transient Impedance, Junction-to-Ambient

Notes:

1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 125°C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}^{(t)}$
4. Surface Mounted