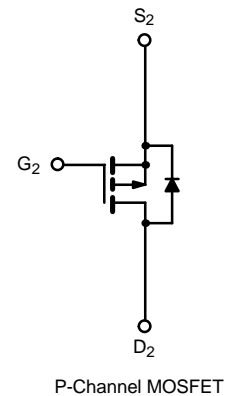
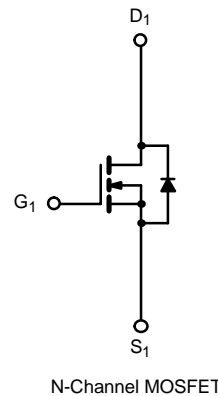
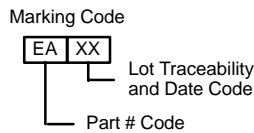
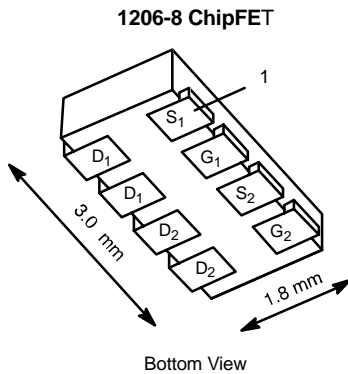


## Complementary 30-V (D-S) MOSFET

PRODUCT SUMMARY			
	$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
N-Channel	30	0.085 @ $V_{GS} = 10$ V	$\pm 3.9$
		0.143 @ $V_{GS} = 4.5$ V	$\pm 3.0$
P-Channel	-30	0.165 @ $V_{GS} = -10$ V	$\pm 2.8$
		0.290 @ $V_{GS} = -4.5$ V	$\pm 2.1$

**TrenchFET<sup>®</sup>**  
Power MOSFETs



Ordering Information: Si5504DC-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		5 secs	Steady State	5 secs	Steady State		
Drain-Source Voltage	$V_{DS}$	30		-30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$					
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$\pm 3.9$	$\pm 2.9$	$\pm 2.8$	$\pm 2.1$	A	
	$T_A = 85^\circ\text{C}$	$\pm 2.8$	$\pm 2.1$	$\pm 2.0$	$\pm 1.5$		
Pulsed Drain Current	$I_{DM}$	$\pm 10$					
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.8	0.9	-1.8	-0.9		
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	2.1	1.1	2.1	1.1	W	
	$T_A = 85^\circ\text{C}$	1.1	0.6	1.1	0.6		
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150					
Soldering Recommendations (Peak Temperature) <sup>b, c</sup>		260					

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	50	60	$^\circ\text{C/W}$
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	30	40	

**Notes**

- Surface Mounted on 1" x 1" FR4 Board.
- See Reliability Manual for profile. The ChipFET/PowerPAK is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
- Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
<b>Static</b>							
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	N-Ch	1.0			V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-1.0			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V	N-Ch P-Ch			±100 ±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V	N-Ch			1	μA
		V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V	P-Ch			-1	
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	N-Ch			5	
		V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	P-Ch			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	N-Ch	10			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	P-Ch	-10			
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.9 A	N-Ch		0.072	0.085	Ω
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -2.1 A	P-Ch		0.137	0.165	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 2.2 A	N-Ch		0.120	0.143	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -1.6 A	P-Ch		0.240	0.290	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 2.9 A	N-Ch		6		S
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -2.1 A	P-Ch		3		
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 0.9 A, V <sub>GS</sub> = 0 V	N-Ch		0.8	1.2	V
		I <sub>S</sub> = -0.9 A, V <sub>GS</sub> = 0 V	P-Ch		-0.8	-1.2	
<b>Dynamic<sup>b</sup></b>							
Total Gate Charge	Q <sub>g</sub>	<b>N-Channel</b> V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.9 A <b>P-Channel</b> V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -2.1 A	N-Ch		5	7.5	nC
Gate-Source Charge	Q <sub>gs</sub>		P-Ch		5.5	6.6	
Gate-Drain Charge	Q <sub>gd</sub>		N-Ch		1.0		
Turn-On Delay Time	t <sub>d(on)</sub>	<b>N-Channel</b> V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω <b>P-Channel</b> V <sub>DD</sub> = -15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω	N-Ch		7	11	ns
Rise Time	t <sub>r</sub>		P-Ch		8	12	
			N-Ch		12	18	
Turn-Off Delay Time	t <sub>d(off)</sub>		P-Ch		11	18	
			N-Ch		12	18	
Fall Time	t <sub>f</sub>		P-Ch		14	21	
			N-Ch		7	11	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 0.9 A, di/dt = 100 A/μs	N-Ch		40	80	
		I <sub>F</sub> = -0.9 A, di/dt = 100 A/μs	P-Ch		40	80	

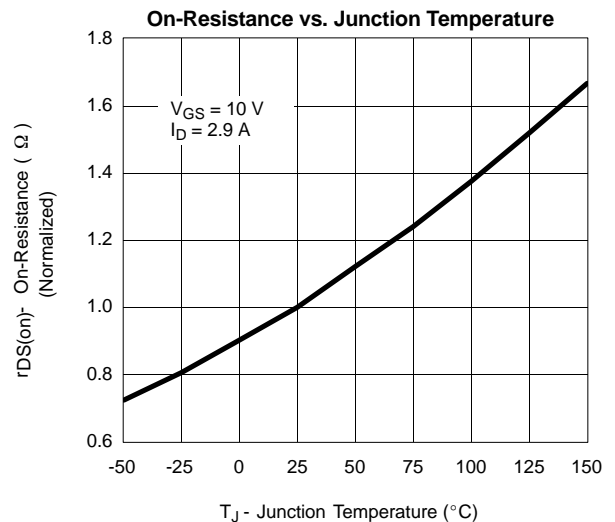
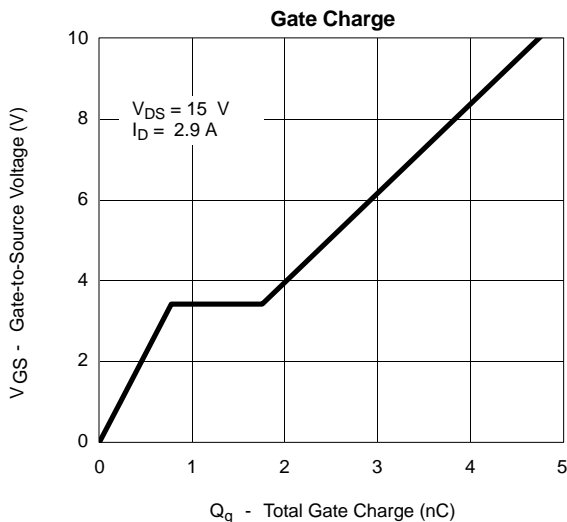
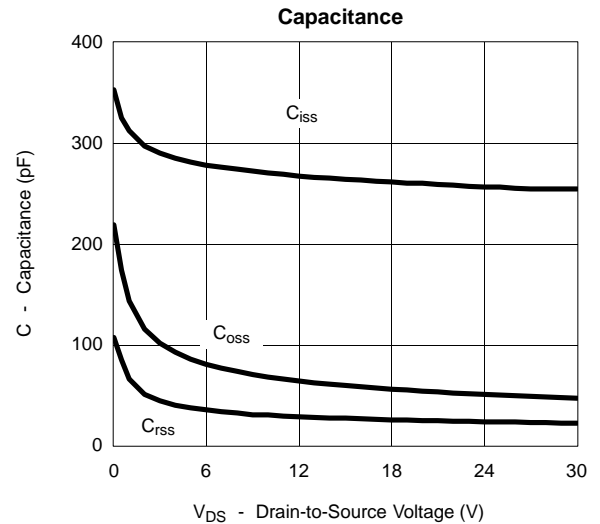
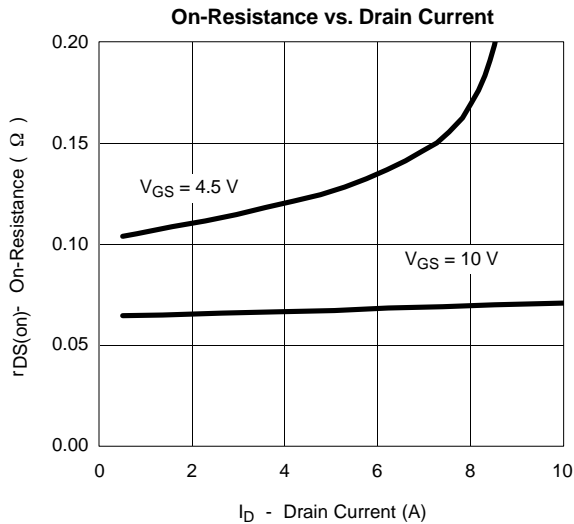
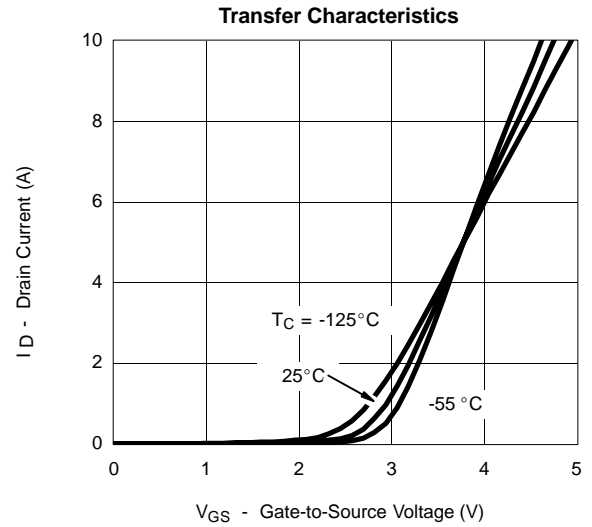
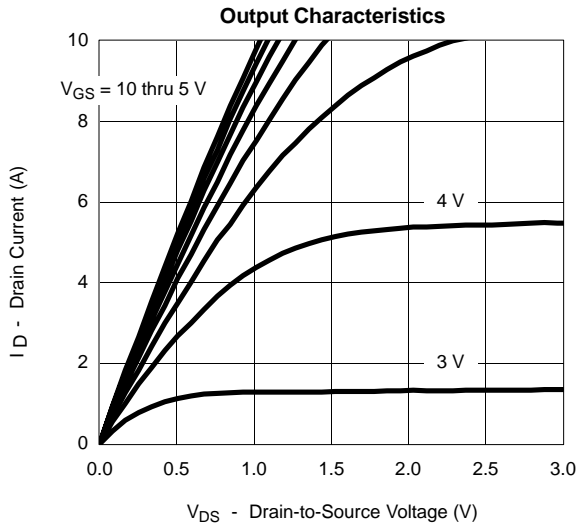
## Notes

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

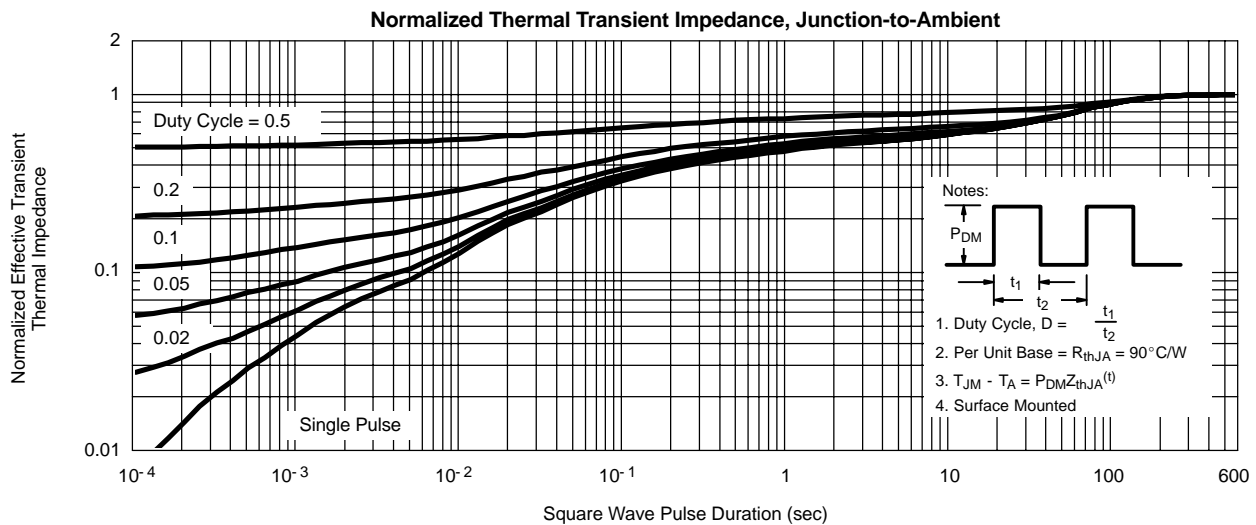
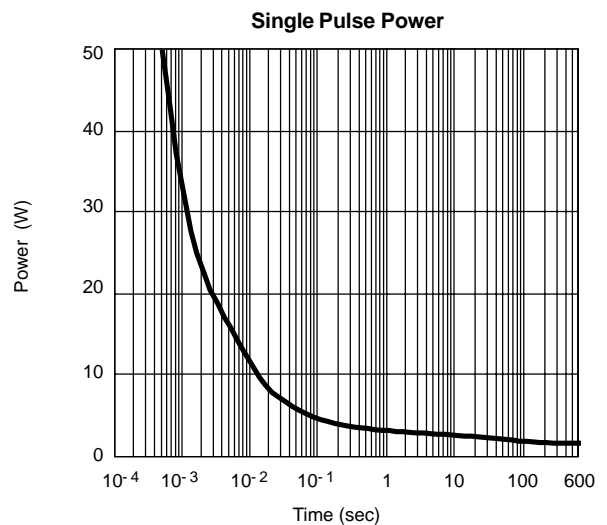
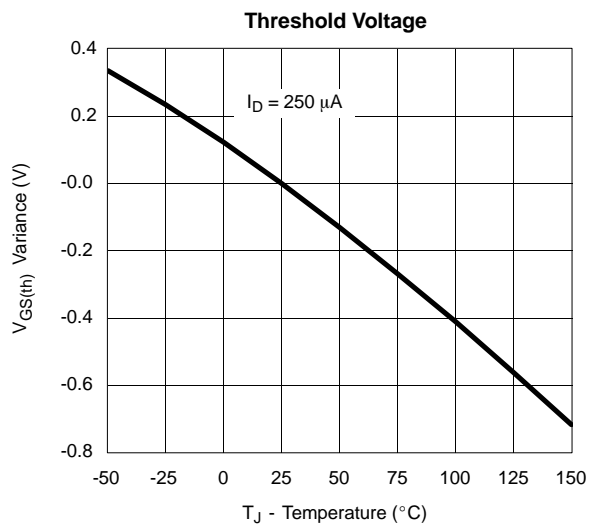
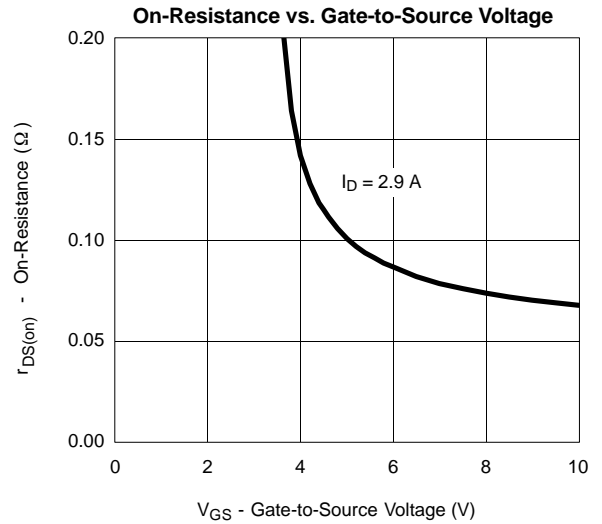
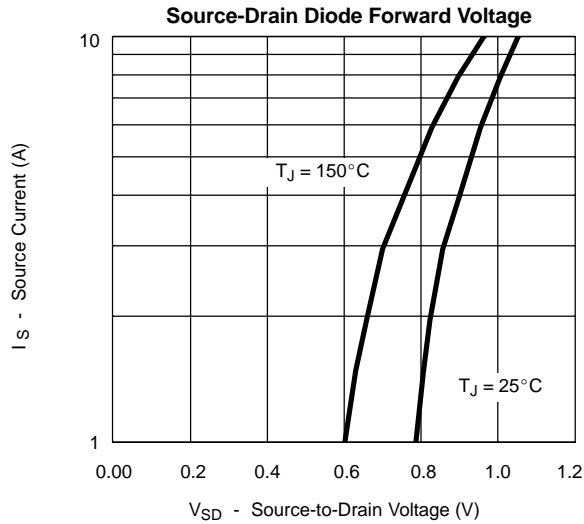


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**



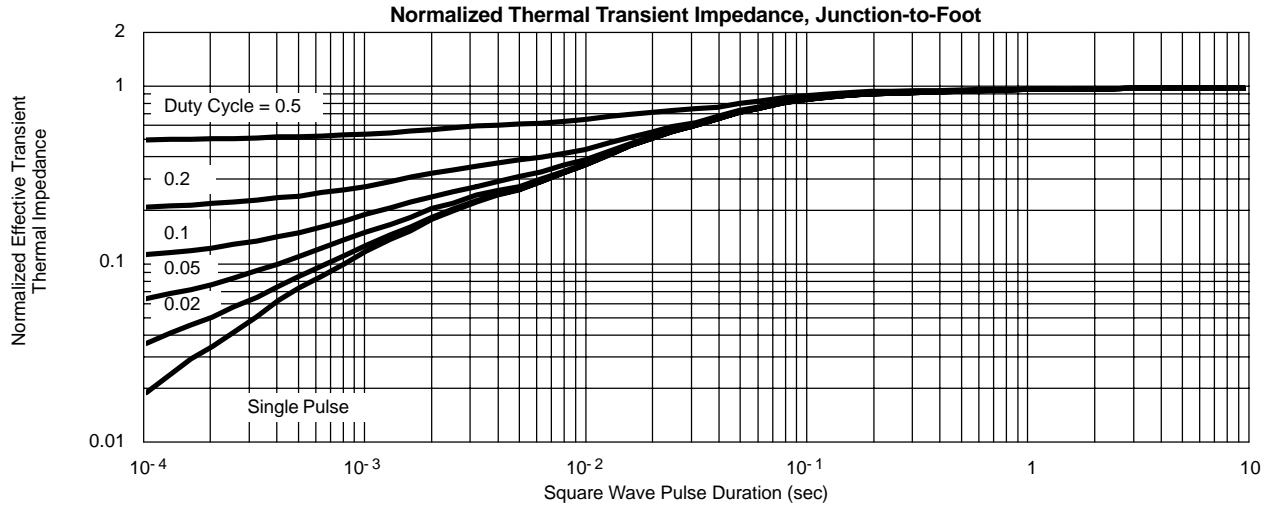
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) N-CHANNEL**





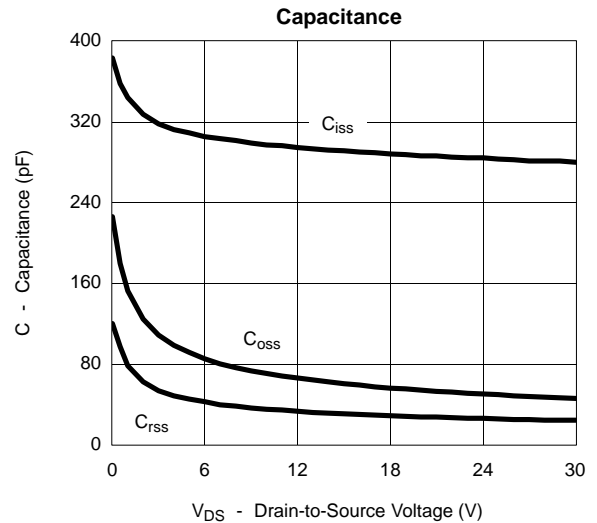
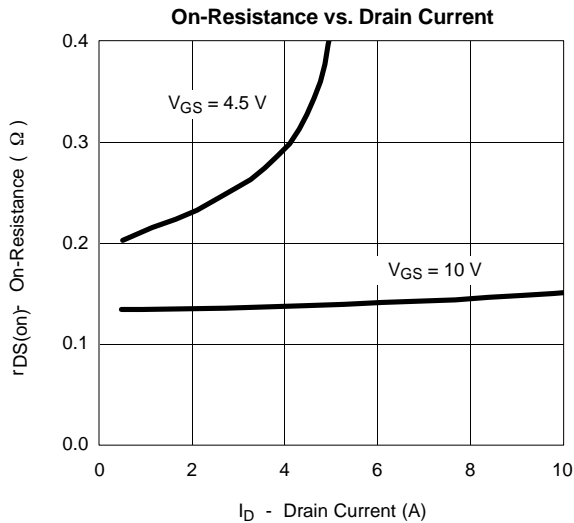
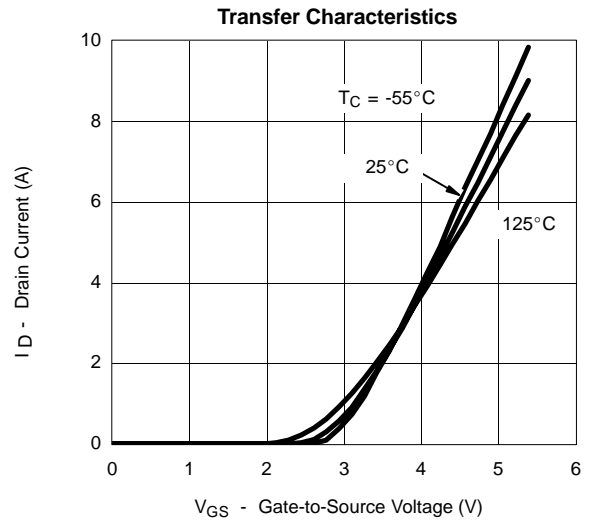
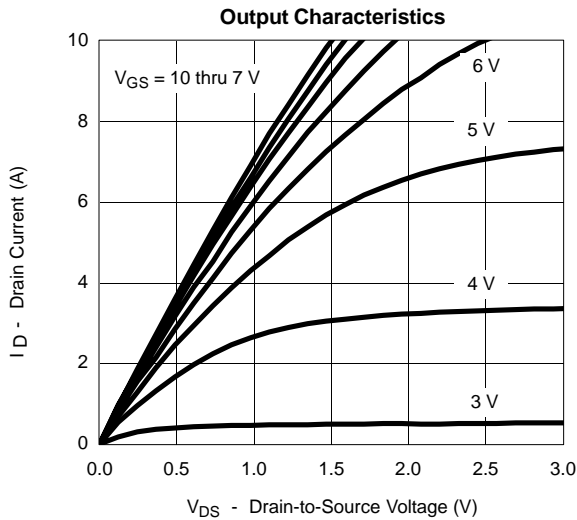
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

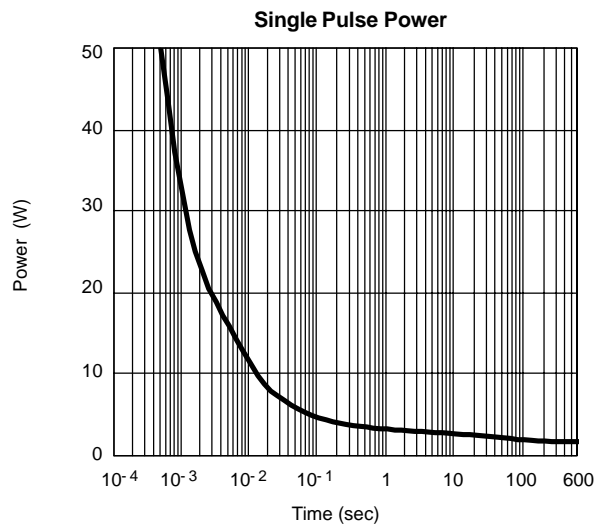
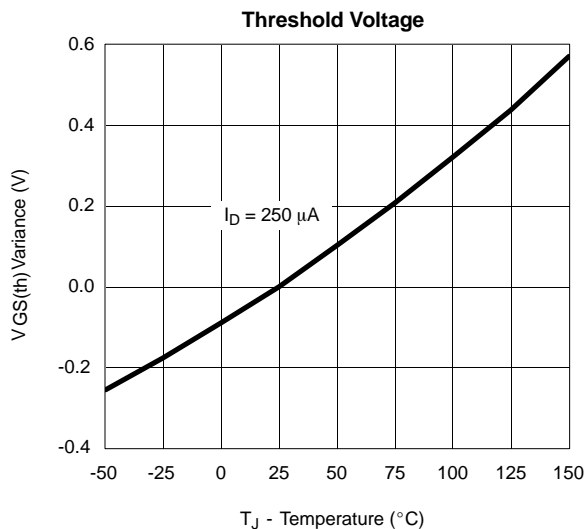
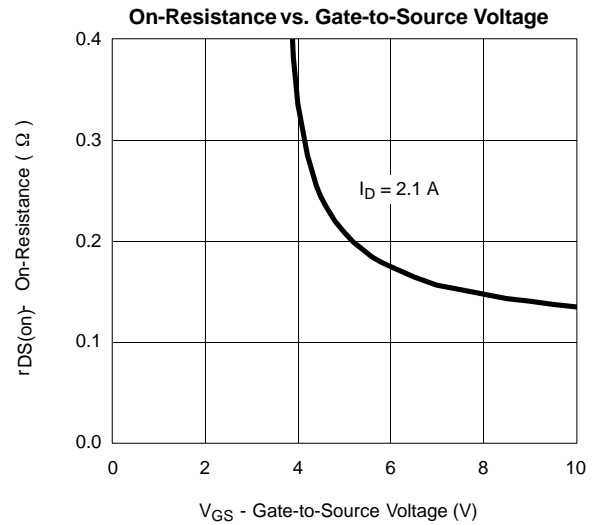
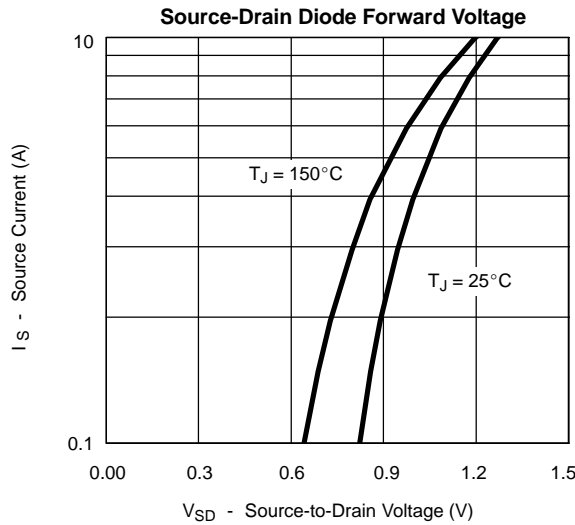
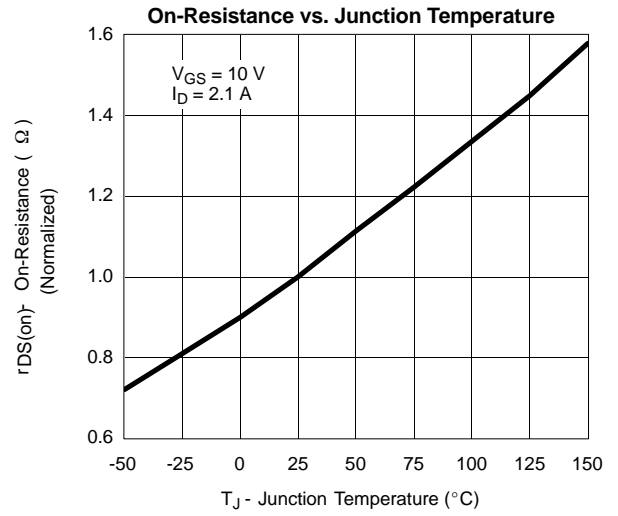
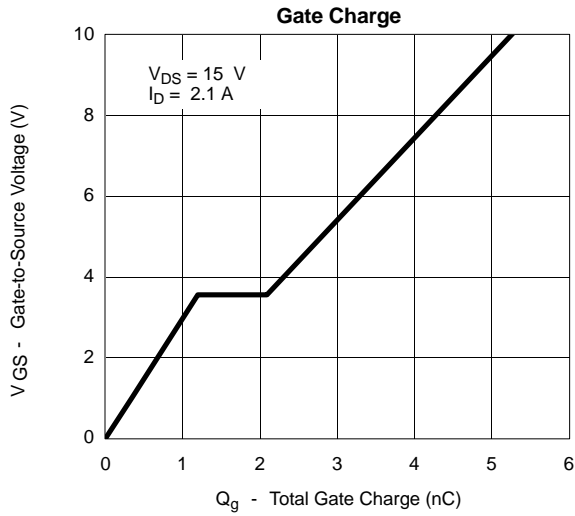


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**

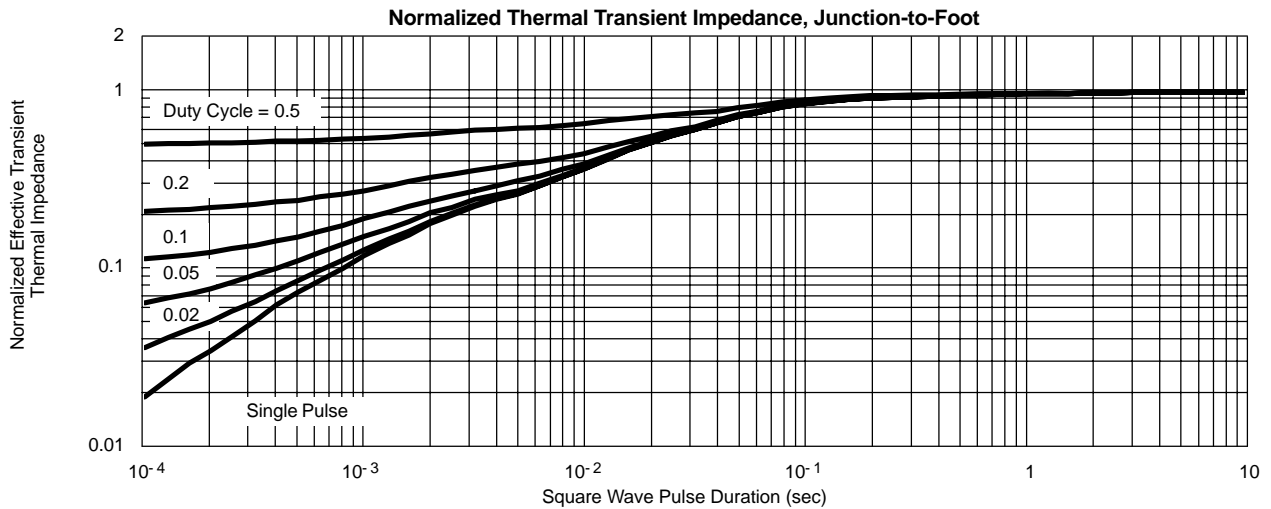
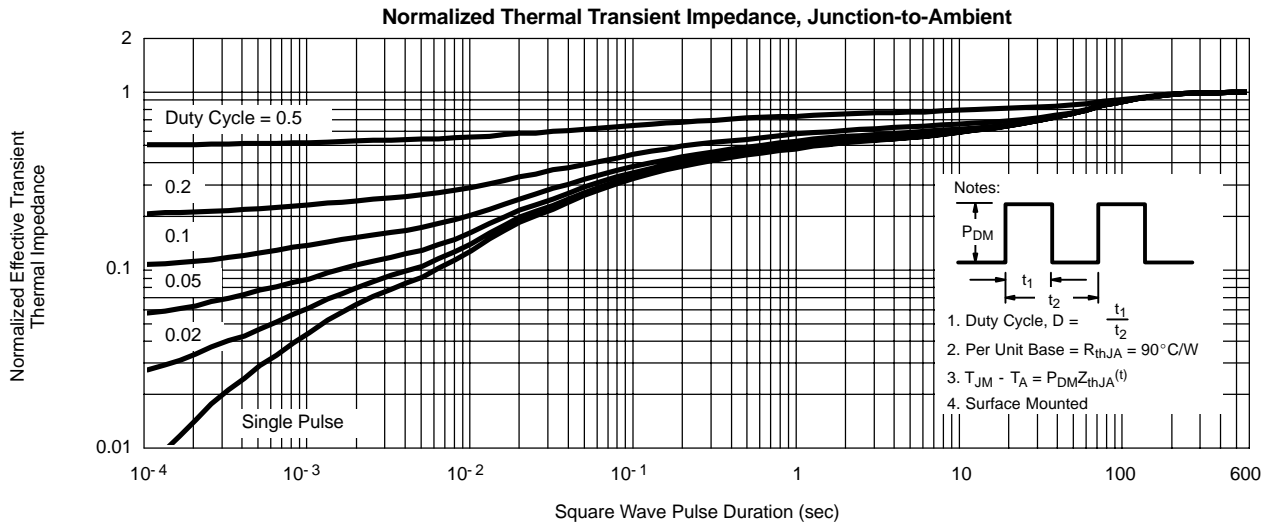


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) P-CHANNEL**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL**





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