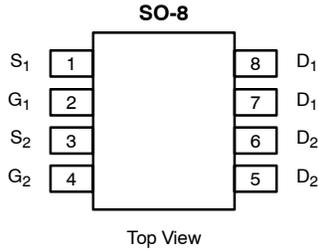


## N- and P-Channel 30-V (D-S) MOSFET

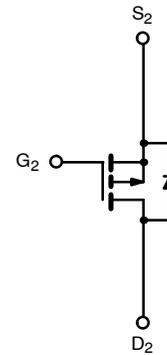
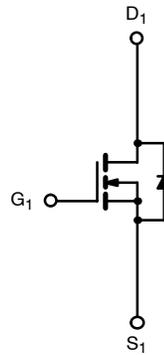
PRODUCT SUMMARY			
	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
N-Channel	30	0.025 @ V <sub>GS</sub> = 10 V	6.9
		0.035 @ V <sub>GS</sub> = 4.5 V	5.8
P-Channel	-30	0.032 @ V <sub>GS</sub> = -10 V	-6.1
		0.045 @ V <sub>GS</sub> = -4.5 V	-5.1

### FEATURES

- TrenchFET® Power MOSFET
- 100% R<sub>g</sub> Tested



Ordering Information: Si4542DY  
Si4542DY-T1 (with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	N-Channel	P-Channel	Unit	
Drain-Source Voltage	V <sub>DS</sub>	30	-30	V	
Gate-Source Voltage	V <sub>GS</sub>	± 20	± 20		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	6.9	A	
		T <sub>A</sub> = 70°C	5.5		
Pulsed Drain Current	I <sub>DM</sub>	40	-40	A	
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	1.7	-1.7		
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25°C	2.0		W
		T <sub>A</sub> = 70°C	1.3		
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C	

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	N- or P-Channel	Unit
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	62.5	°C/W

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


**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		±100	nA	
			P-Ch		±100		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V	N-Ch		1	μA	
		V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V	P-Ch		-1		
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	N-Ch		25		
		V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	P-Ch		-25		
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	20		A	
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	P-Ch	-20			
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.9 A	N-Ch		0.020	0.025	Ω
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -6.1 A	P-Ch		0.026	0.032	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.8 A	N-Ch		0.026	0.035	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -5.1 A	P-Ch		0.036	0.045	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 6.9 A	N-Ch		25	S	
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -6.1 A	P-Ch		16		
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V	N-Ch		1.2	V	
		I <sub>S</sub> = -1.7 A, V <sub>GS</sub> = 0 V	P-Ch		-1.2		
<b>Dynamic<sup>b</sup></b>							
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.9 A P-Channel V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -6.1 A	N-Ch		30	50	nC
Gate-Source Charge	Q <sub>gs</sub>		N-Ch		7.5		
Gate-Drain Charge	Q <sub>gd</sub>		P-Ch		7.0		
Gate Resistance	R <sub>g</sub>		N-Ch	0.5	2	3.4	Ω
			P-Ch	2	4	6.8	
Turn-On Delay Time	t <sub>d(on)</sub>	N-Channel V <sub>DD</sub> = 15 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω P-Channel V <sub>DD</sub> = -15 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω	N-Ch		12	20	ns
Rise Time	t <sub>r</sub>		N-Ch		10	20	
			P-Ch		10	20	
Turn-Off Delay Time	t <sub>d(off)</sub>		N-Ch		60	90	
			P-Ch		55	80	
Fall Time	t <sub>f</sub>		N-Ch		15	30	
		P-Ch		25	40		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs	N-Ch		50	90	
		I <sub>F</sub> = -1.7 A, di/dt = 100 A/μs	P-Ch		50	90	
Reverse Recovery Time	Q <sub>rr</sub>	I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs	N-Ch		45	nc	
		I <sub>F</sub> = -1.7 A, di/dt = 100 A/μs	P-Ch		55		

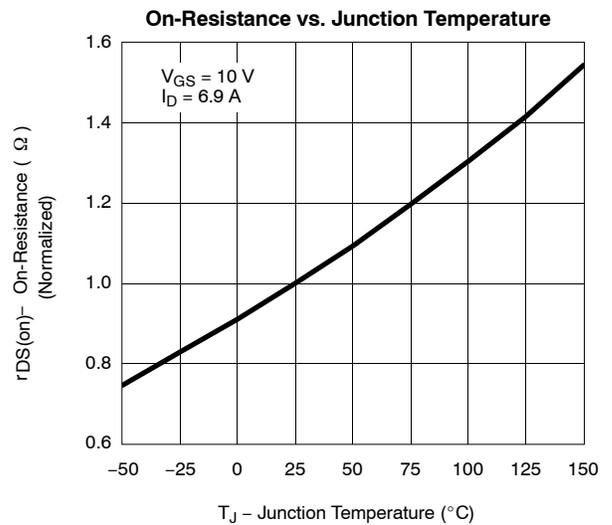
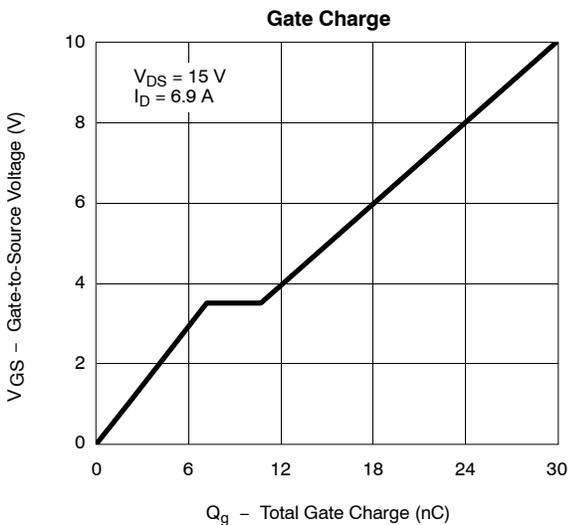
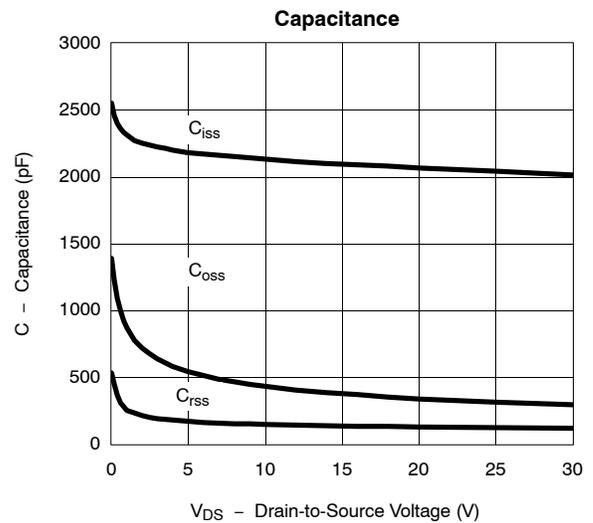
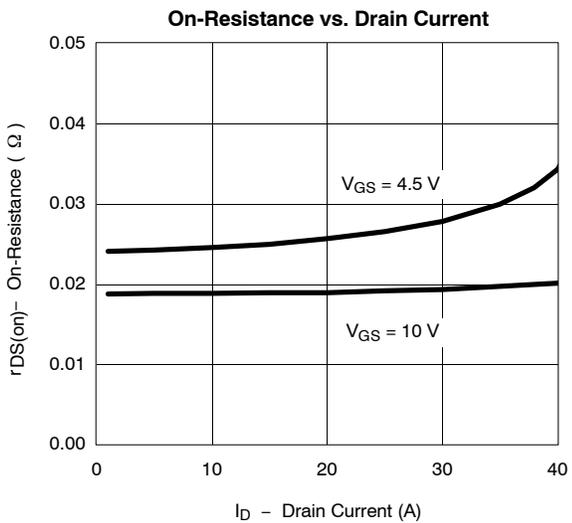
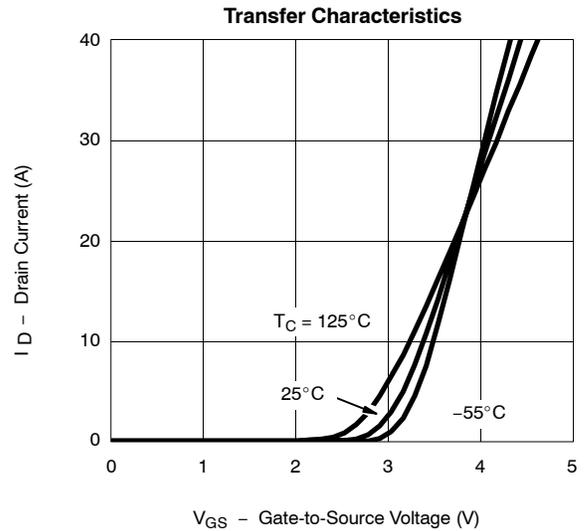
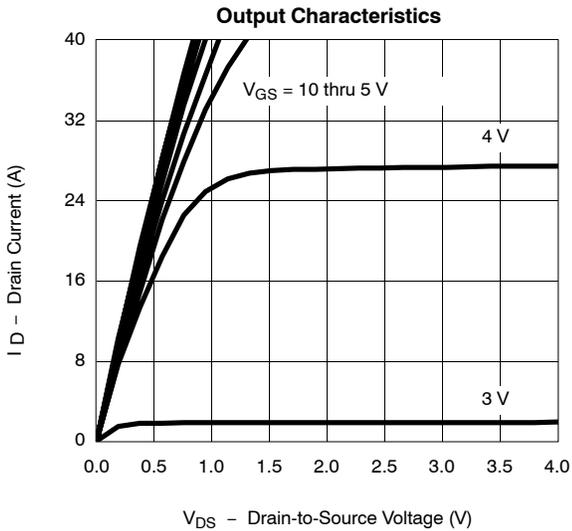
## Notes

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



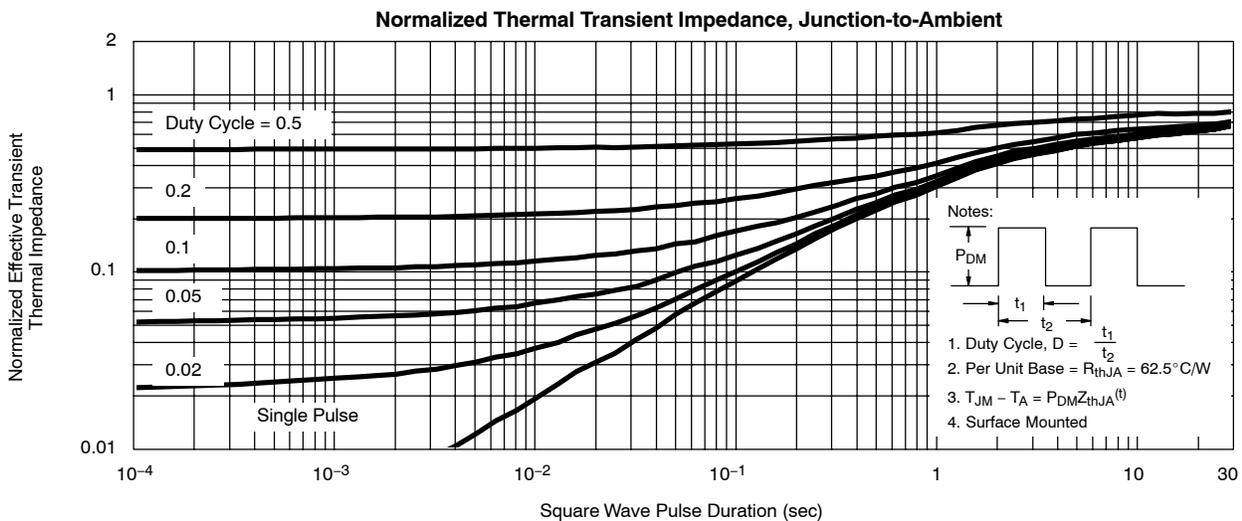
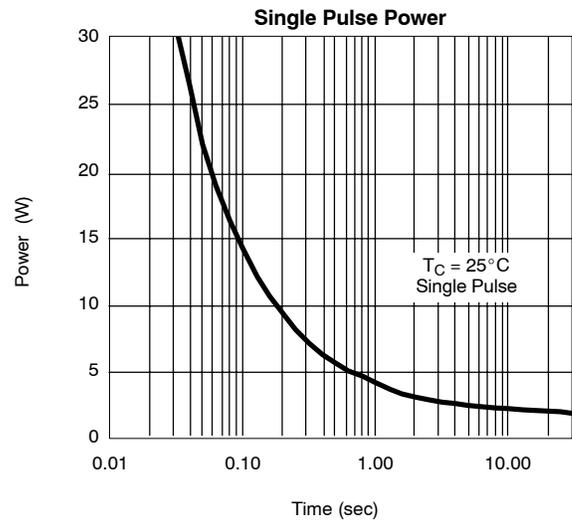
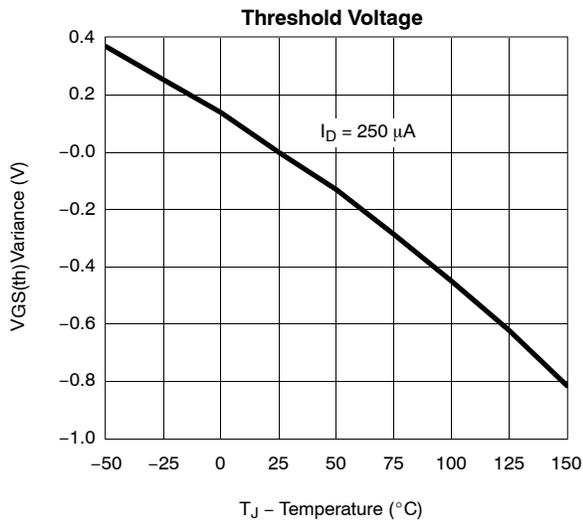
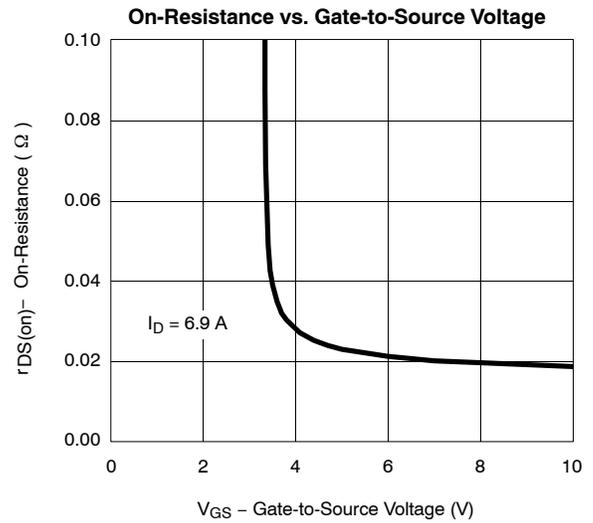
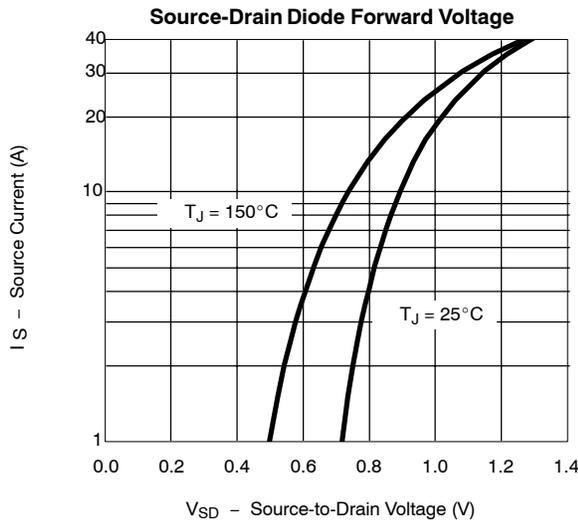
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**



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

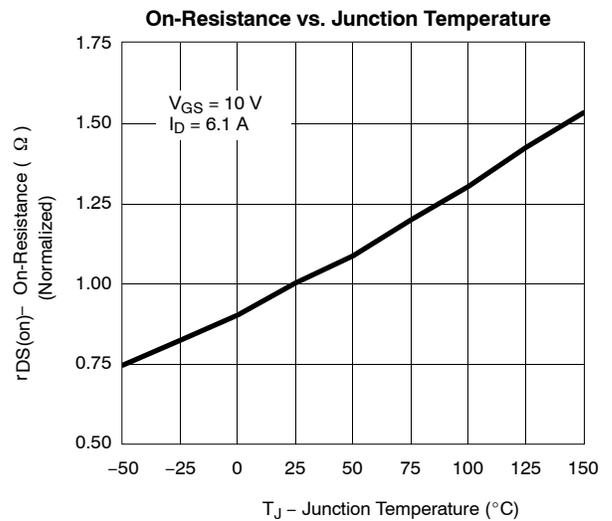
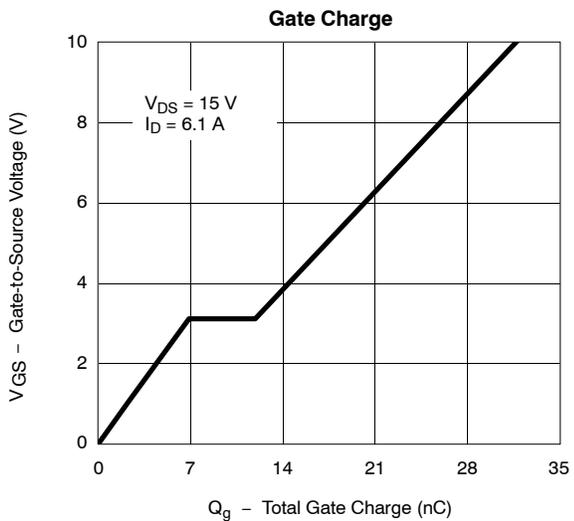
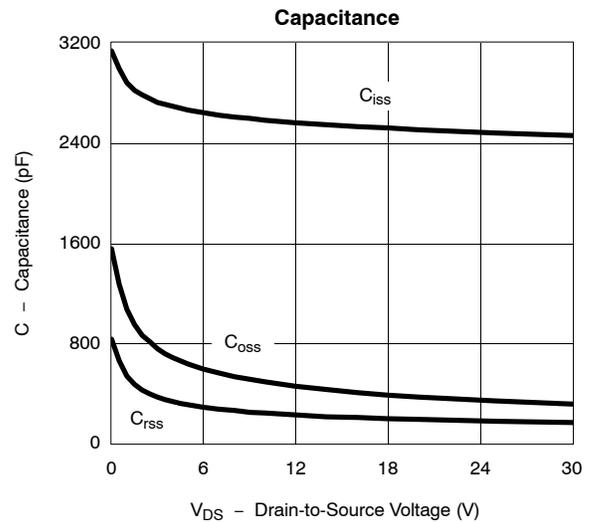
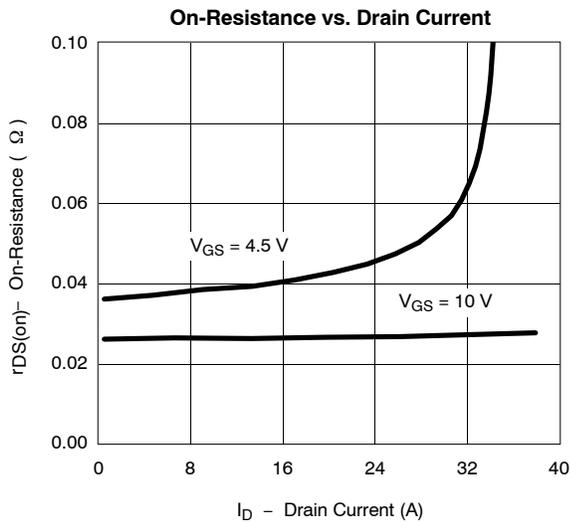
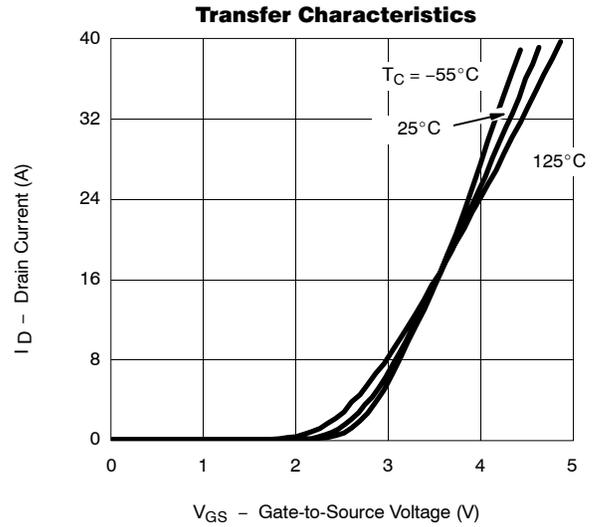
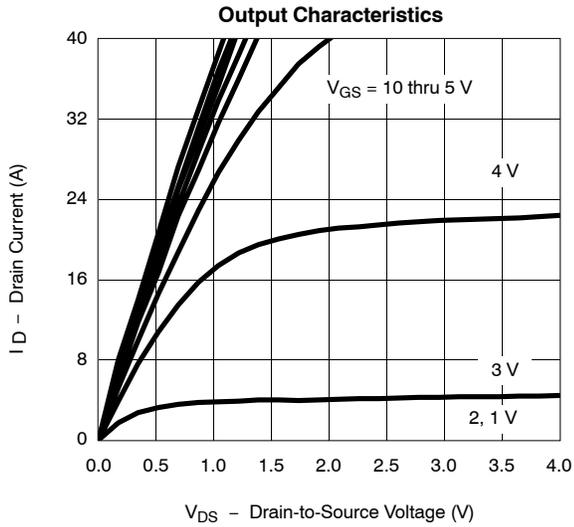
**N-CHANNEL**



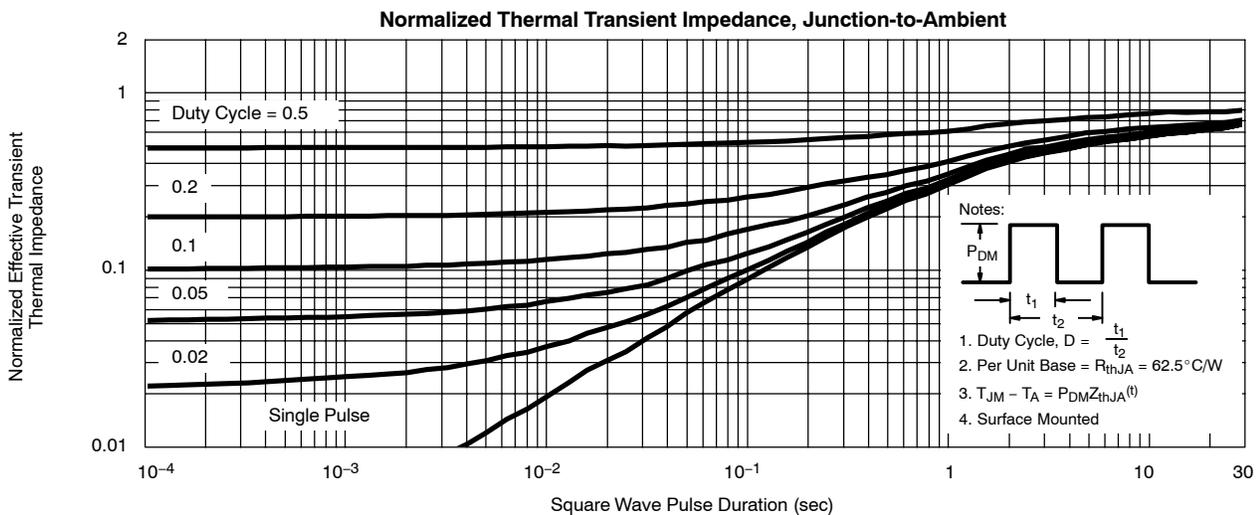
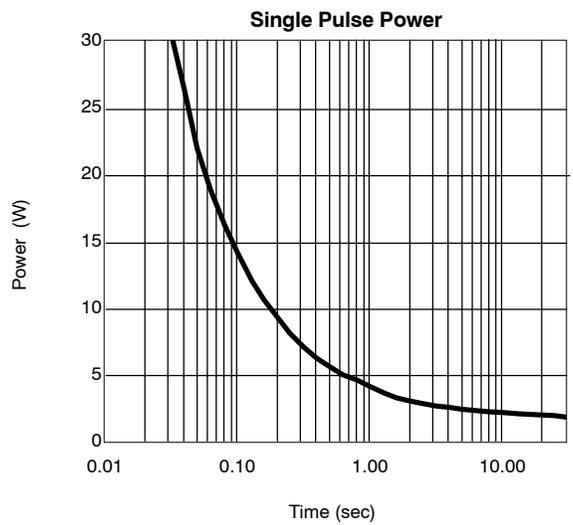
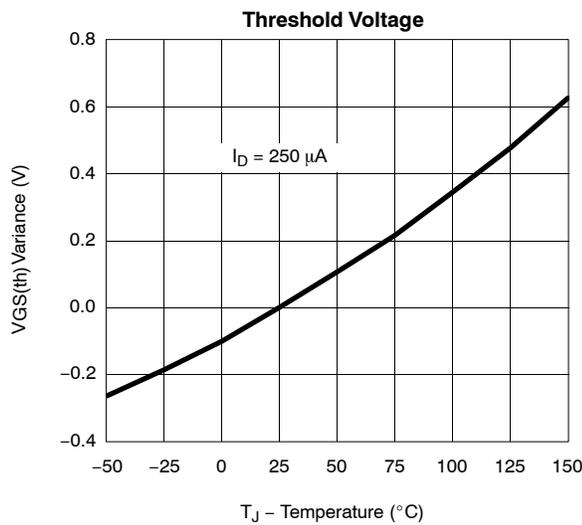
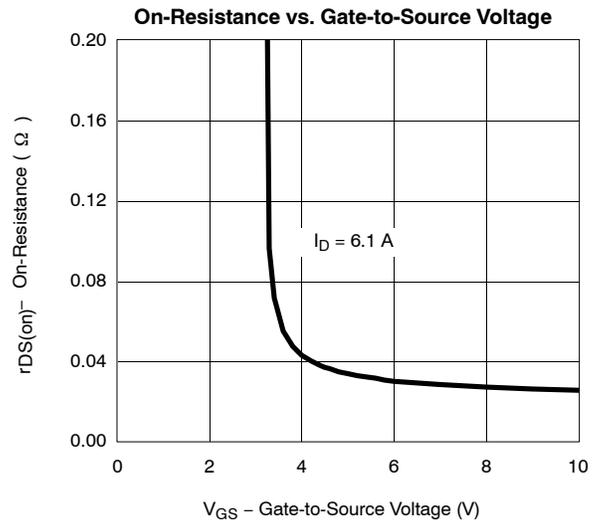
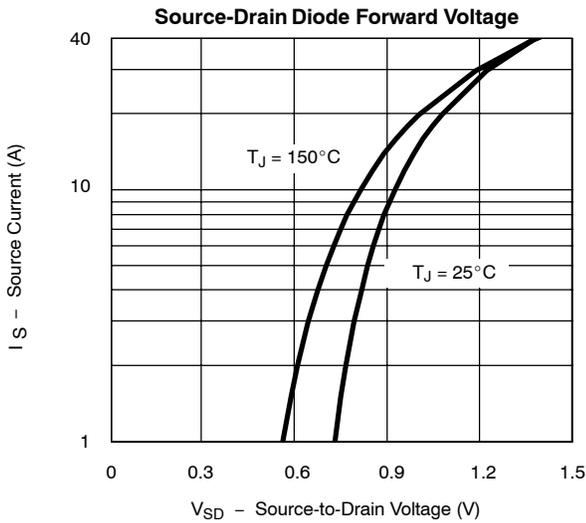


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**



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





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