

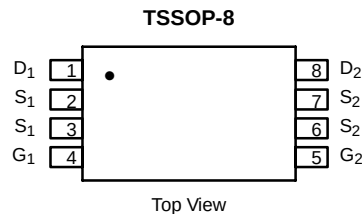


N- and P-Channel 30-V (D-S) MOSFET

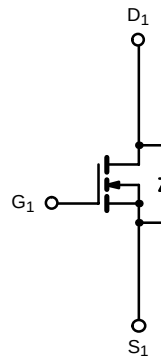
PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	30	0.032 @ $V_{GS} = 10$ V	4.3
		0.046 @ $V_{GS} = 4.5$ V	3.7
P-Channel	-30	0.043 @ $V_{GS} = -10$ V	-3.8
		0.073 @ $V_{GS} = -4.5$ V	-2.8

FEATURES

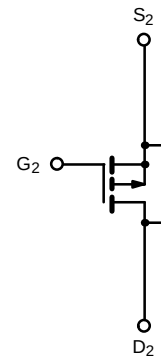
- TrenchFET® Power MOSFETS



Ordering Information: Si6544BDQ-T1



N-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)							
Parameter		Symbol	N-Channel		P-Channel		Unit
			10 sec	Steady State	10 sec	Steady State	
Drain-Source Voltage		V _{DS}	30		-30		V
Gate-Source Voltage		V _{GS}	± 20				
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	4.3	3.7	-3.8	-3.8	A
	T _A = 70°C		3.5	3.0	-3.0	-2.6	
Pulsed Drain Current		I _{DM}	20		-20		
Continuous Source Current (Diode Conduction) ^a		I _S	1..0	0.7	-1..0	-0.7	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	1.14	0.83	1.14	0.83	W
	T _A = 70°C		0.73	0.53	0.73	0.53	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150				°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	88	110	$^\circ\text{C/W}$
	Steady State		120	150	
Maximum Junction-to-Foot (Drain)		R_{thJF}	65	80	

Notes

a. Surface Mounted on FR4 Board, $t \leq 10$ 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	1.0		3.0	V	
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-1.0		-3.0		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	N-Ch P-Ch			±100 ±100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V	N-Ch			1	μA	
		V _{DS} = -24 V, V _{GS} = 0 V	P-Ch			-1		
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 55°C	N-Ch			5		
		V _{DS} = -24 V, V _{GS} = 0 V, T _J = 55°C	P-Ch			-5		
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	N-Ch	20			A	
		V _{DS} ≥ -5 V, V _{GS} = -10 V	P-Ch	-20				
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 4.3 A	N-Ch		0.025	0.032	Ω	
		V _{GS} = -10 V, I _D = -3.8 A	P-Ch		0.034	0.043		
		V _{GS} = 4.5 V, I _D = 3.7 A	N-Ch		0.037	0.046		
		V _{GS} = -4.5 V, I _D = -2.8 A	P-Ch		0.058	0.073		
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 4.3 A	N-Ch		11		S	
		V _{DS} = -15 V, I _D = -3.8 A	P-Ch		11			
Diode Forward Voltage ^a	V _{SD}	I _S = 1.25 A, V _{GS} = 0 V	N-Ch		0.77	1.1	V	
		I _S = -1.25 A, V _{GS} = 0 V	P-Ch		-0.77	-1.1		
Dynamic ^b								
Total Gate Charge	Q _g	N-Channel V _{DS} = 15 V, V _{GS} = 10 V, I _D = 4.3 A P-Channel V _{DS} = -15 V, V _{GS} = -10 V, I _D = -3.8 A	N-Ch P-Ch		9.5 16	15 25	nC	
Gate-Source Charge	Q _{gs}		N-Ch P-Ch		1.8 2.3			
Gate-Drain Charge	Q _{gd}		N-Ch P-Ch		1.55 4.5			
Gate Resistance	R _g		N-Ch P-Ch		0.45 8.8			Ω
Turn-On Delay Time	t _{d(on)}		N-Channel V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω P-Channel V _{DD} = -15 V, R _L = 15 Ω I _D ≅ -1 A, V _{GEN} = -10 V, R _G = 6 Ω	N-Ch P-Ch		13 14	25 25	ns
Rise Time	t _r			N-Ch P-Ch		14 14	25 25	
Turn-Off Delay Time	t _{d(off)}	N-Ch P-Ch			30 40	50 65		
Fall Time	t _f	N-Ch P-Ch			10 30	20 50		
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.25 A, di/dt = 100 A/μs		N-Ch		30	60	
		I _F = -1.25 A, di/dt = 100 A/μs		P-Ch		30		

Notes

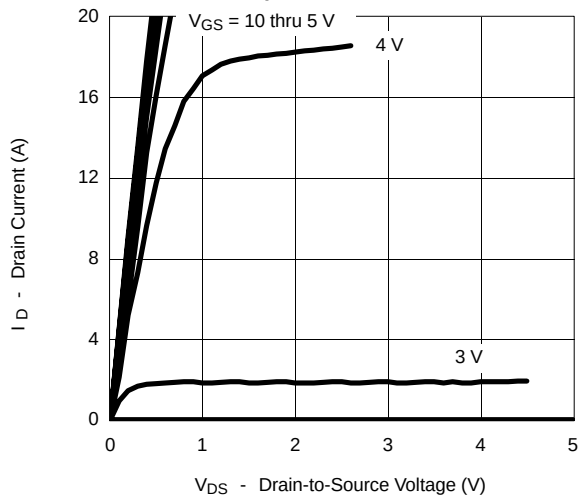
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
 b. Guaranteed by design, not subject to production testing.



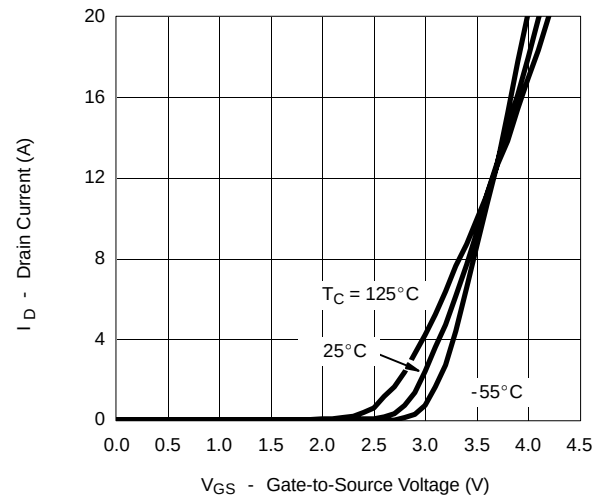
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

N-CHANNEL

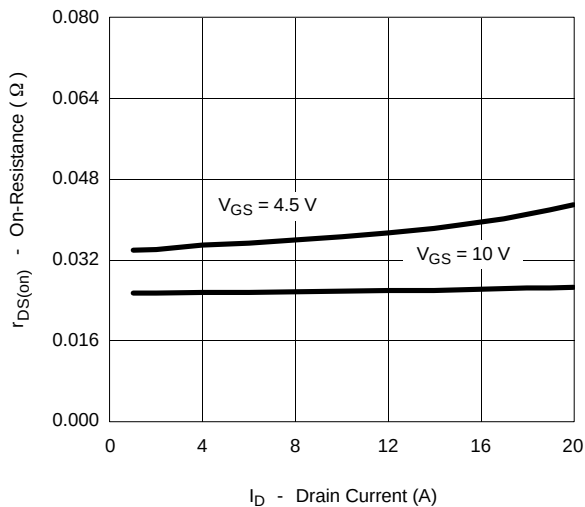
Output Characteristics



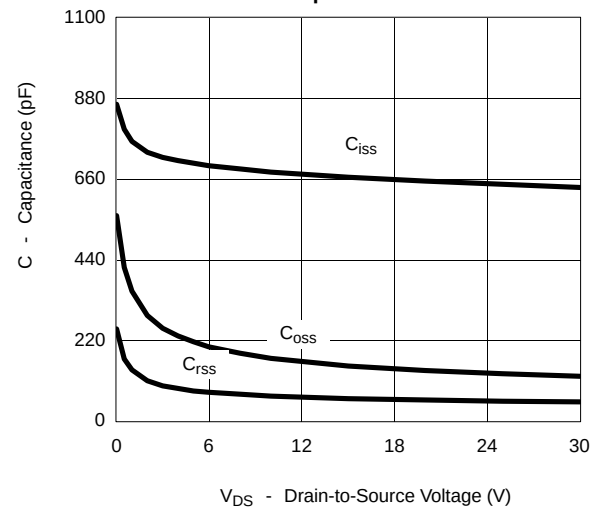
Transfer Characteristics



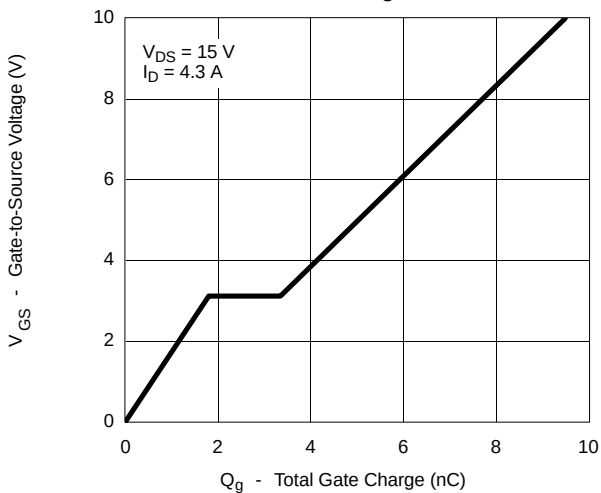
On-Resistance vs. Drain Current



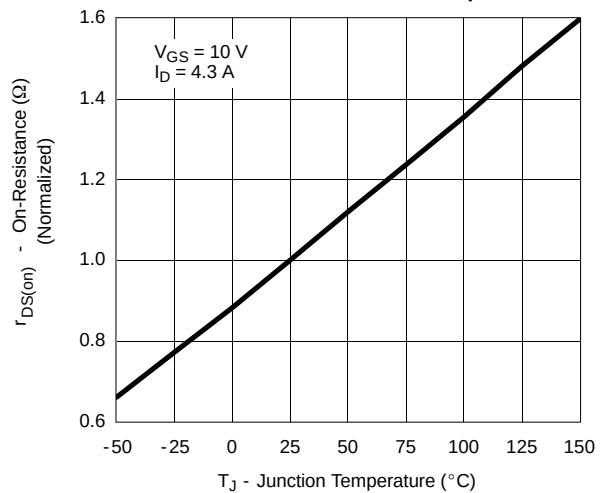
Capacitance



Gate Charge



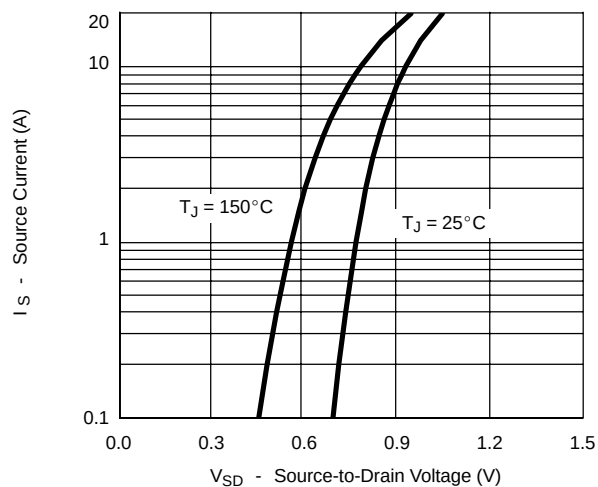
On-Resistance vs. Junction Temperature



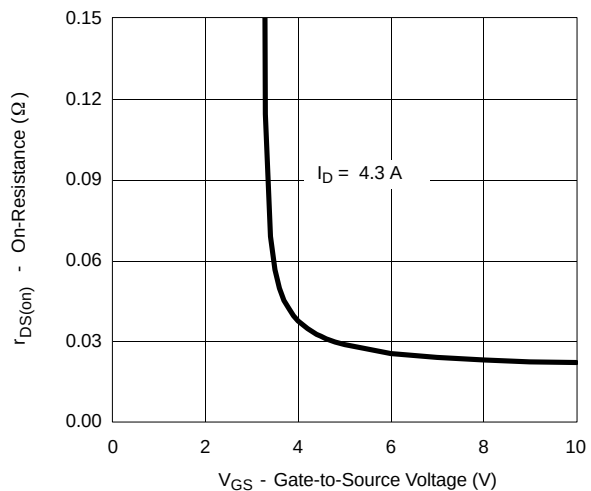
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

N-CHANNEL

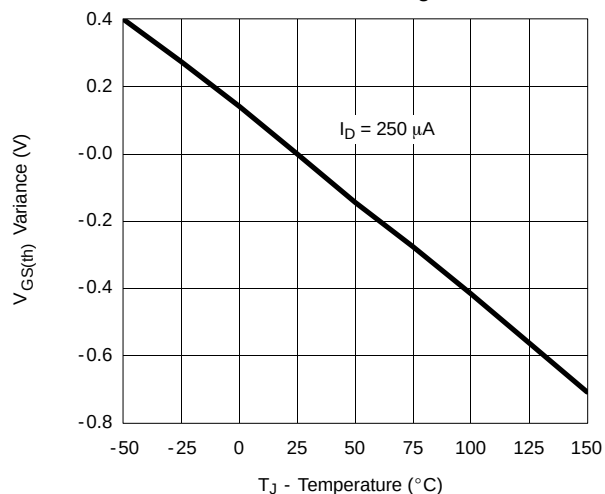
Source-Drain Diode Forward Voltage



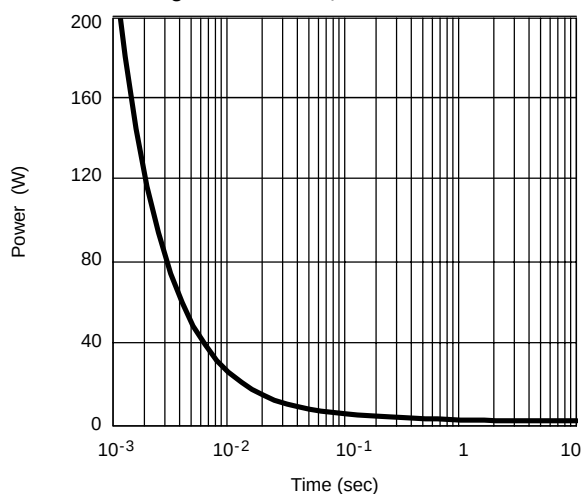
On-Resistance vs. Gate-to-Source Voltage



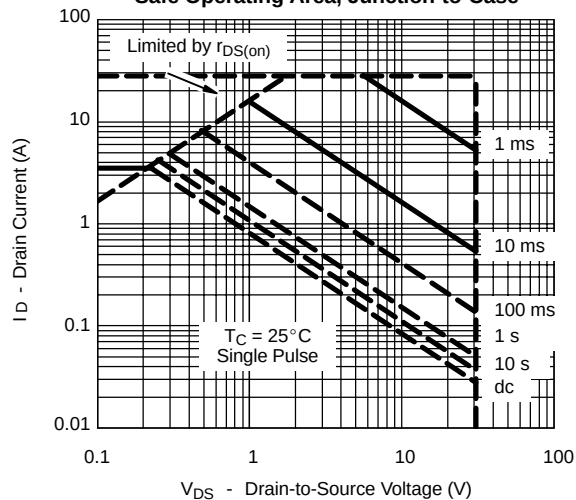
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case

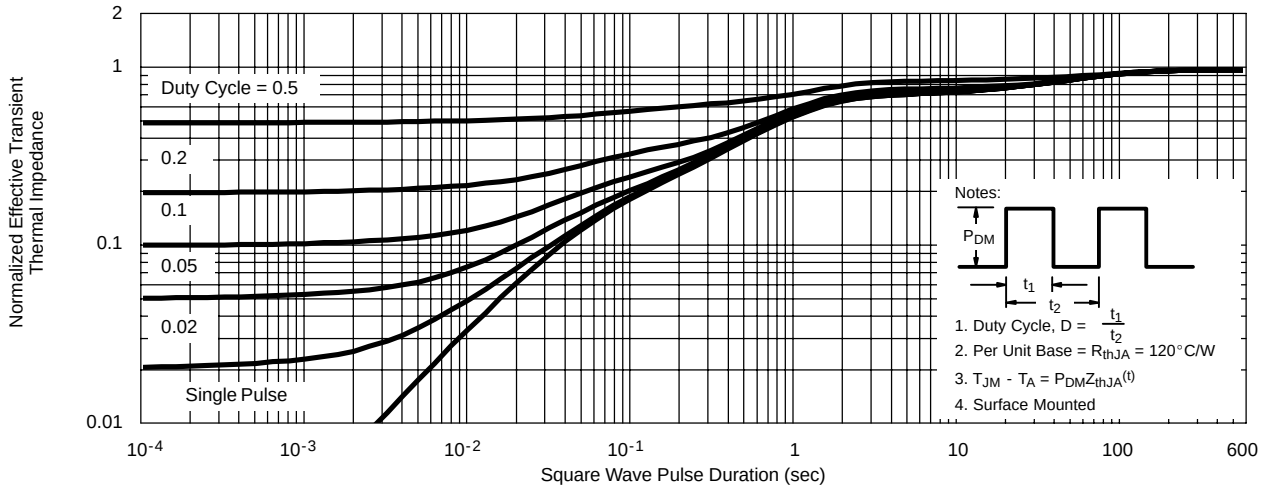




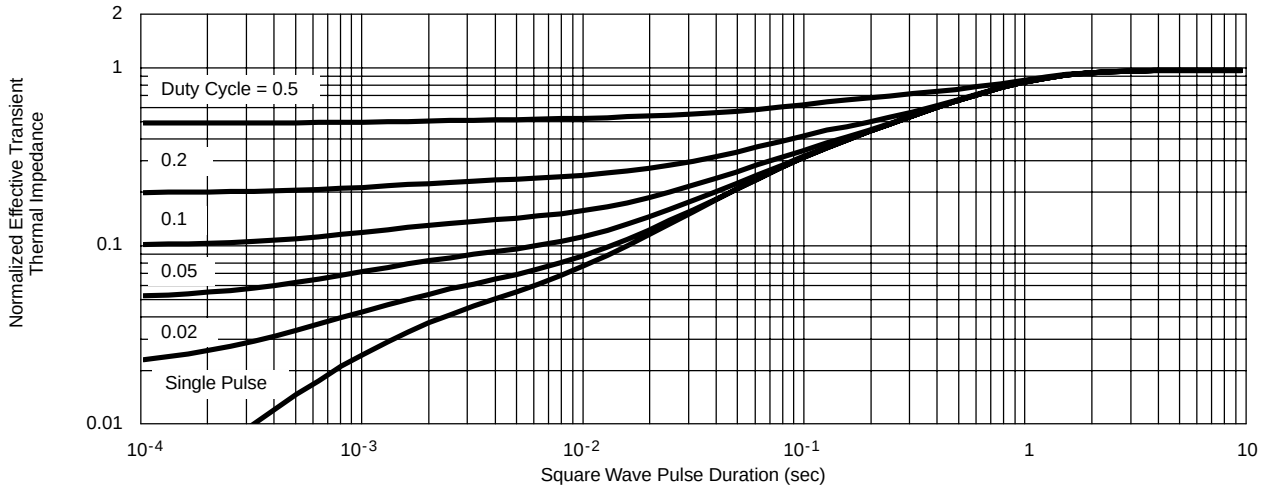
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

N-CHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



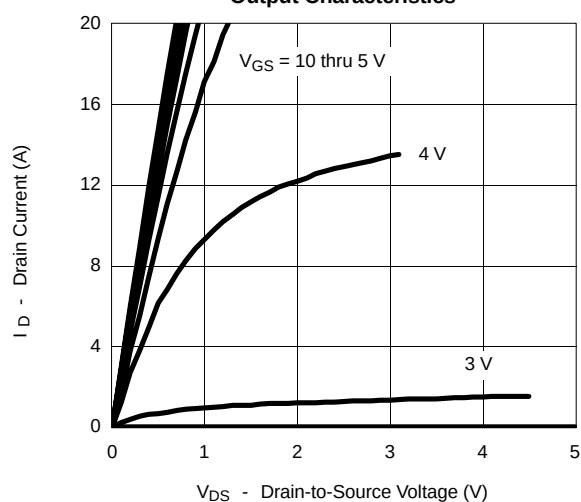
Normalized Thermal Transient Impedance, Junction-to-Foot



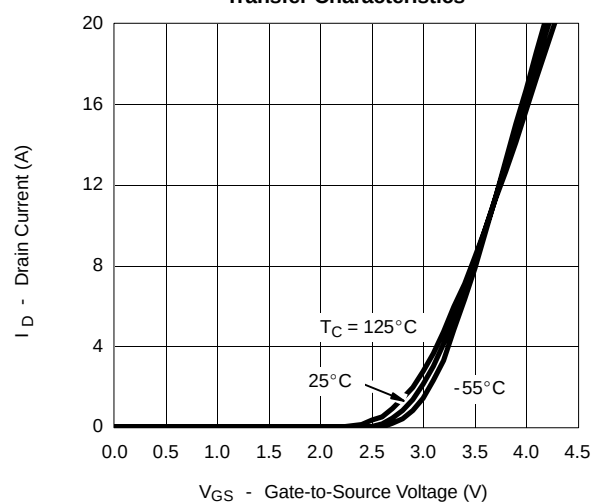
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

P-CHANNEL

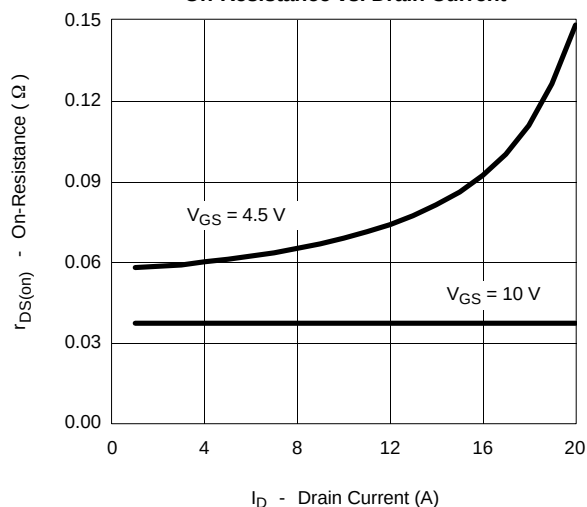
Output Characteristics



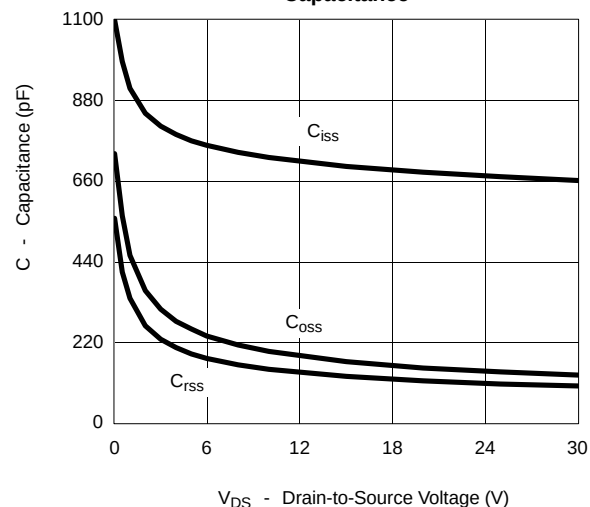
Transfer Characteristics



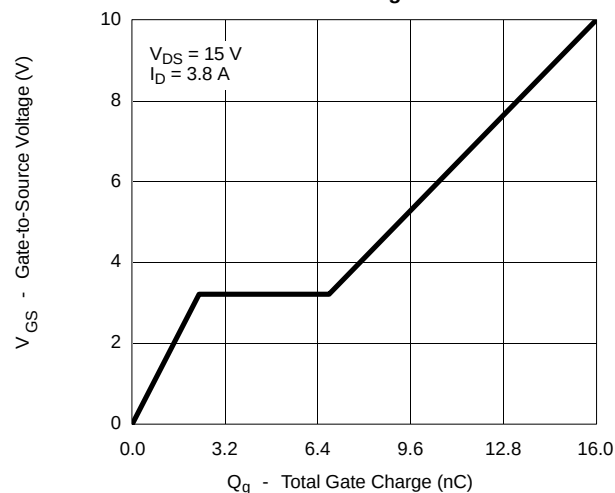
On-Resistance vs. Drain Current



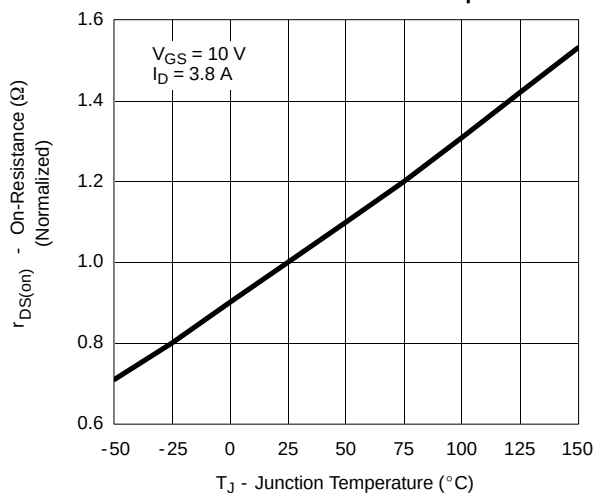
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

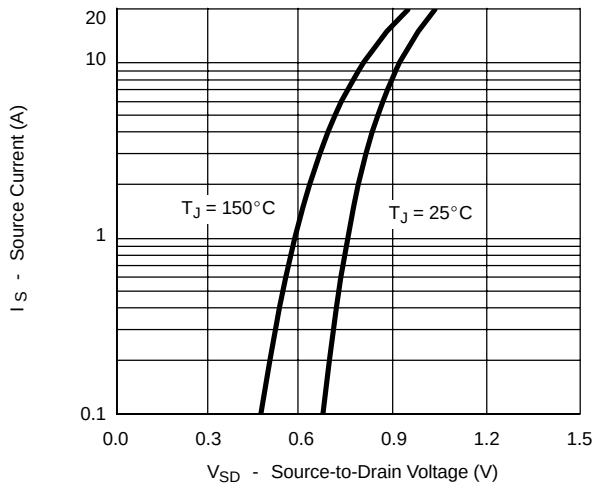




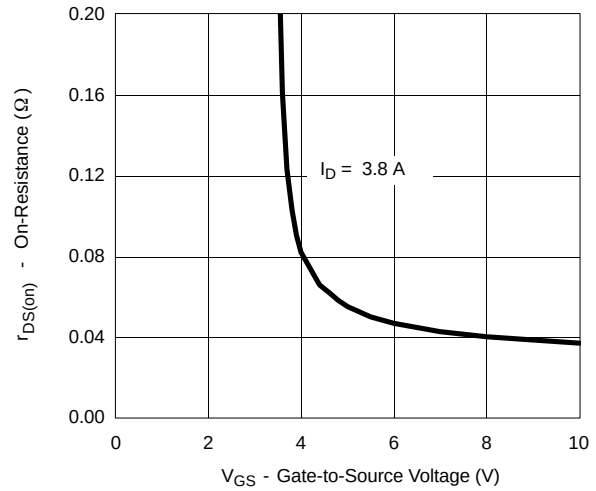
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

P-CHANNEL

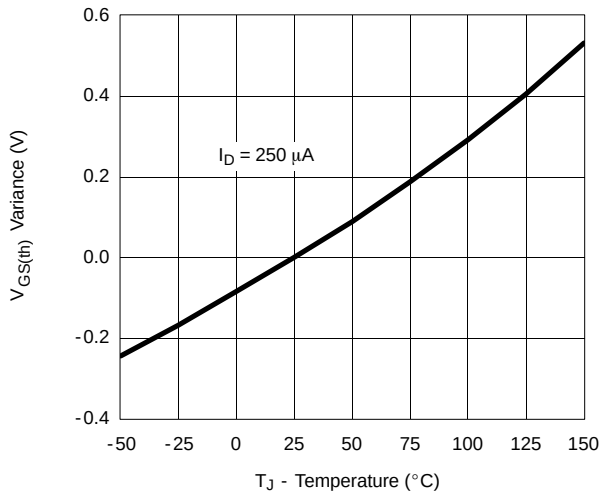
Source-Drain Diode Forward Voltage



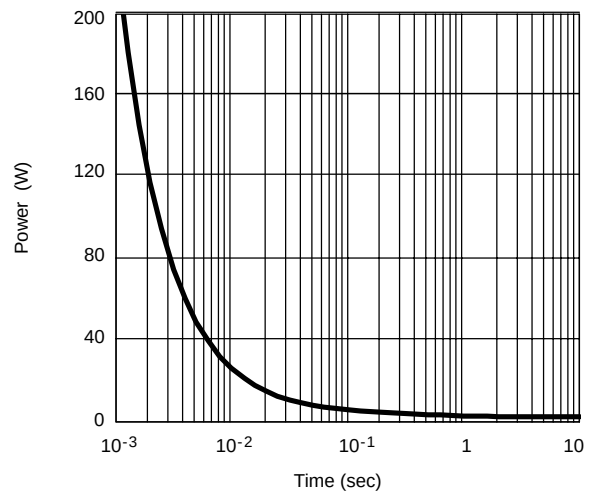
On-Resistance vs. Gate-to-Source Voltage



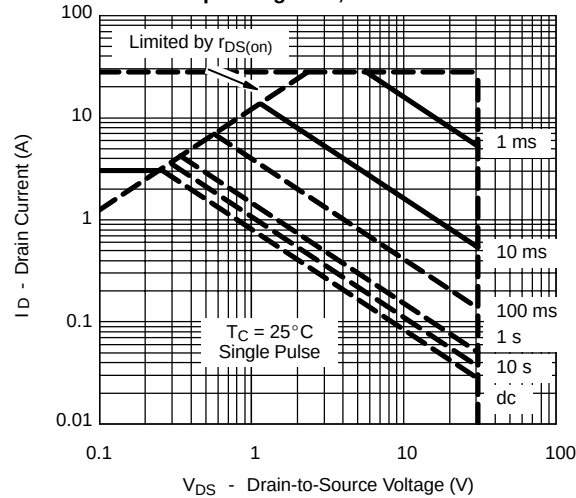
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



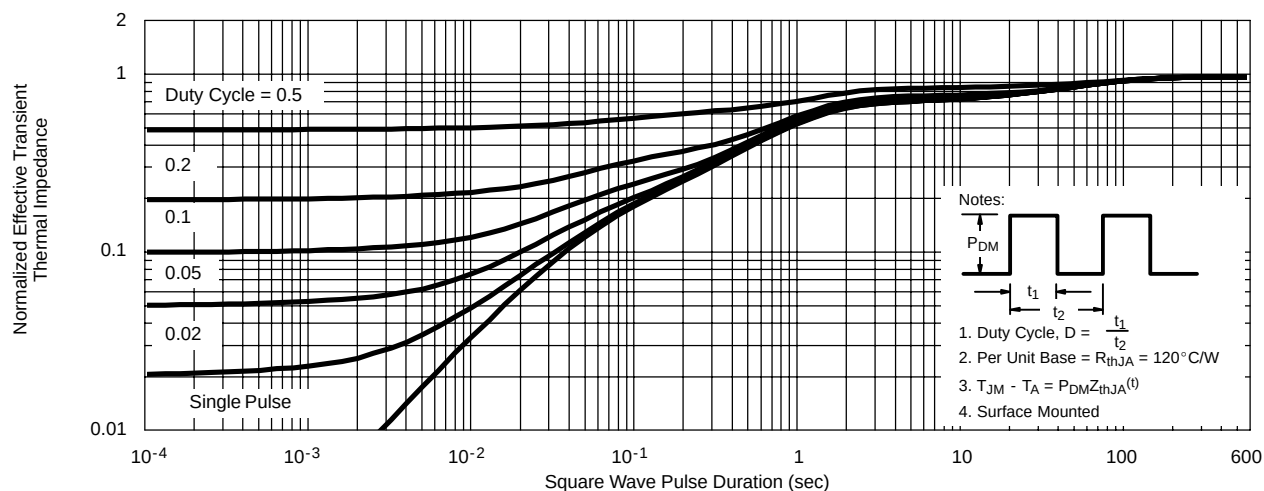
Safe Operating Area, Junction-to-Case



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

P-CHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

