



Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY

	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
Channel-1	30	0.022 @ V _{GS} = 10 V	10
		0.030 @ V _{GS} = 4.5 V	8
Channel-2		0.022 @ V _{GS} = 10 V	10
		0.028 @ V _{GS} = 4.5 V	8

SCHOTTKY PRODUCT SUMMARY

V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.50 V @ 1.0 A	3.0

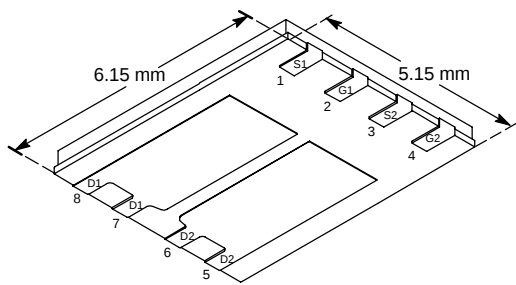
FEATURES

- LITTLE FOOT *Plus*™ Schottky
- PWM Optimized
- New Low Thermal Resistance PowerPAK package with low 1.07 mm profile

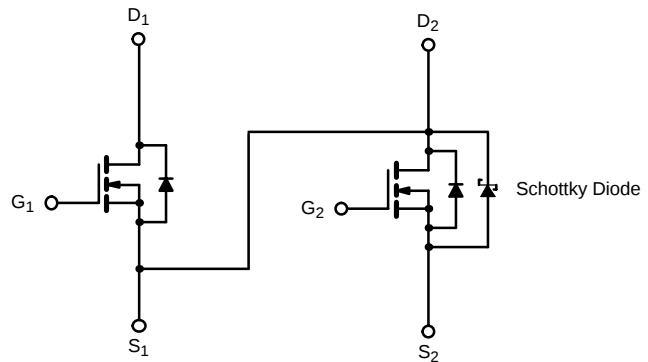
APPLICATIONS

- Asymmetrical Buck-Boost DC/DC Converter

PowerPAK™ SO-8



Bottom View



N-Channel MOSFET

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs		Steady State		Unit
			Channel-1	Channel-2	Channel-1	Channel-2	
Drain-Source Voltage		V _{DS}	30				V
Gate-Source Voltage		V _{GS}	± 20	± 12	± 20	± 12	
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	10		6.4		A
	T _A = 70°C		7		5.1		
Pulsed Drain Current		I _{DM}	30				
Continuous Source Current (Diode Conduction) ^a		I _S	2.9		1.1		
Maximum Power Dissipation ^a	T _A = 25°C	P _D	3.5		1.4		W
	T _A = 70°C		2.2		0.9		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150				°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	MOSFET		Schottky		Unit
			Typical	Maximum	Typical	Maximum	
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	26	35	26	35	$^\circ\text{C/W}$
	Steady-State		60	85	60	85	
Maximum Junction-to-Case (Drain)	Steady-State	R_{thJC}	4.1	6.0	4.1	6.0	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED).							
Parameter	Symbol	Test Condition		Min	Typ ^a	Max	Unit
Static							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	Ch-1	1.0		3.0	V
			Ch-2	0.8		2.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	Ch-1			±100	nA
		V _{DS} = 0 V, V _{GS} = ±12 V	Ch-2			±100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V	Ch-1			1	μA
			Ch-2			100	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 85 °C	Ch-1			15	
			Ch-2			2000	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	Ch-1	20			A
			Ch-2	20			
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 7.5 A	Ch-1		0.017	0.022	Ω
			Ch-2		0.016	0.022	
		V _{GS} = 4.5 V, I _D = 6.5 A	Ch-1		0.024	0.030	
			Ch-2		0.020	0.028	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 7.5 A	Ch-1		19		S
			Ch-2		21		
Diode Forward Voltage ^b	V _{SD}	I _S = 1 A, V _{GS} = 0 V	Ch-1		0.75	1.2	V
			Ch-2		0.47	0.5	
Dynamic ^a							
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 7.5 A	Ch-1		7	11	nC
			Ch-2		11.5	18	
Gate-Source Charge	Q _{gs}		Ch-1		2.9		
			Ch-2		3.8		
Gate-Drain Charge	Q _{gd}		Ch-1		2.5		
			Ch-2		3.5		
Gate Resistance	R _G	Ch-1		1.5		Ω	
		Ch-2		1.8			
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω	Ch-1		9	15	ns
			Ch-2		12	20	
Rise Time	t _r		Ch-1		10	17	
			Ch-2		10	17	
Turn-Off Delay Time	t _{d(off)}		Ch-1		19	30	
			Ch-2		40	66	
Fall Time	t _f		Ch-1		9	15	
			Ch-2		9	15	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 A/μs	Ch-1		35	55	
			Ch-2		28	45	

Notes

- a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

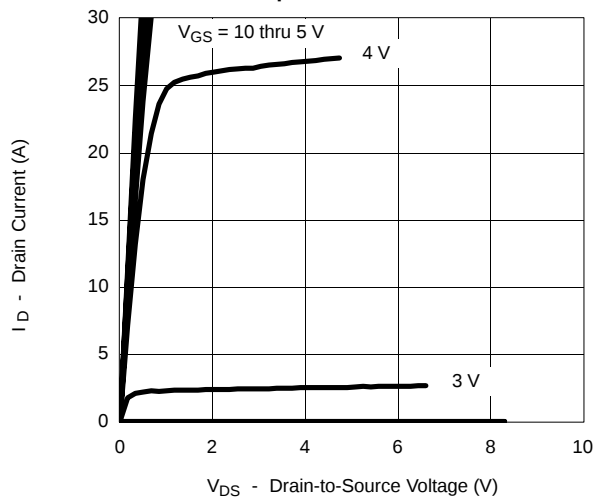
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\ \text{A}$		0.47	0.50	V
		$I_F = 1.0\ \text{A}, T_J = 125^\circ\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30\ \text{V}$		0.004	0.100	mA
		$V_r = 30\ \text{V}, T_J = 100^\circ\text{C}$		0.7	10	
		$V_r = -30\ \text{V}, T_J = 125^\circ\text{C}$		3.0	20	
Junction Capacitance	C_T	$V_r = 10\ \text{V}$		50		pF



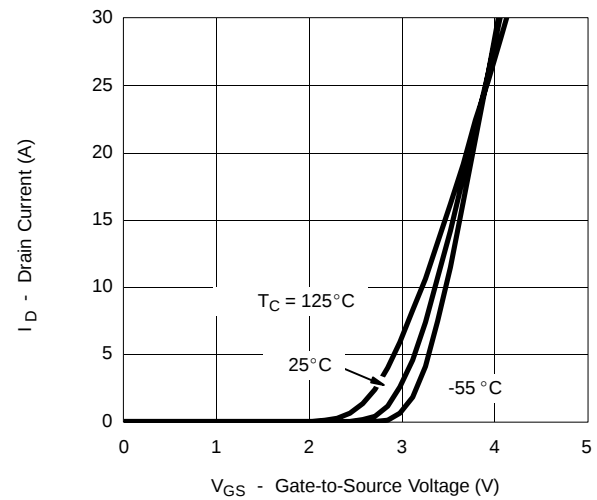
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL-1

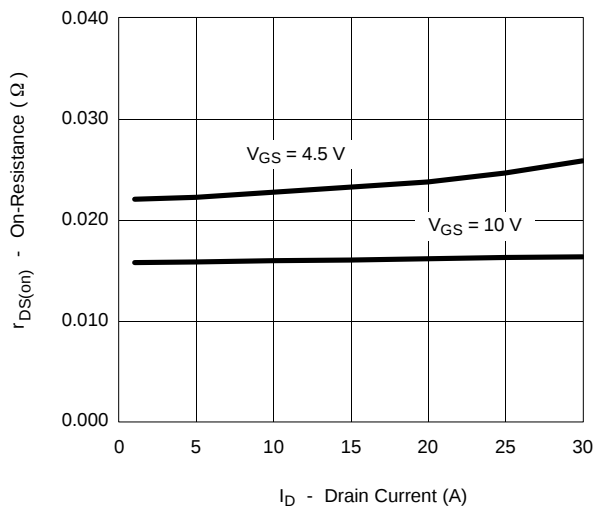
Output Characteristics



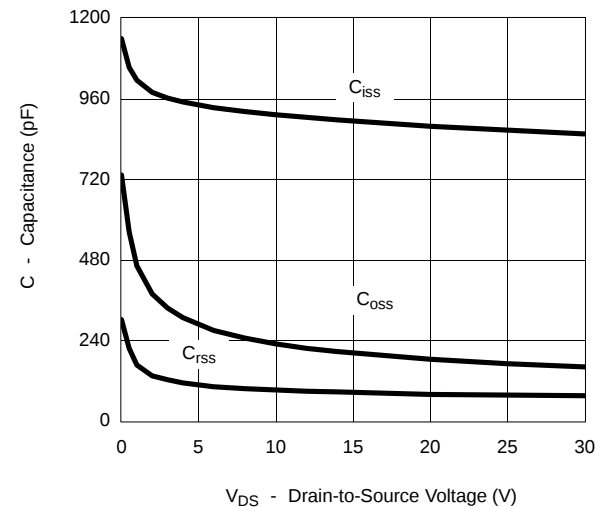
Transfer Characteristics



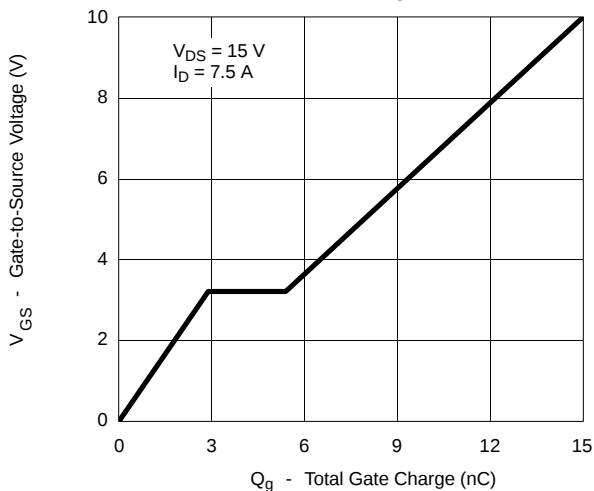
On-Resistance vs. Drain Current



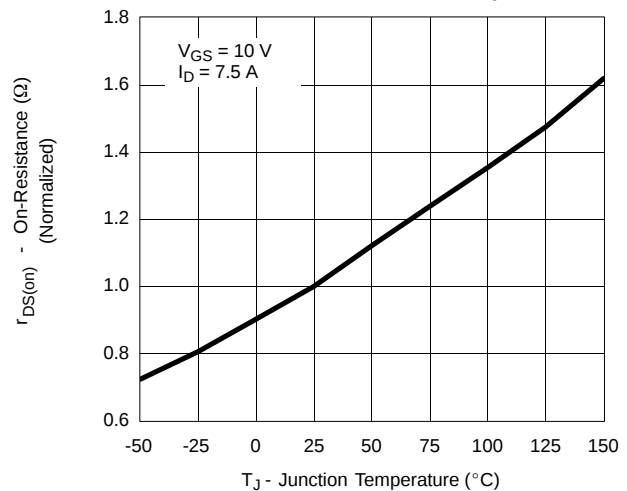
Capacitance



Gate Charge



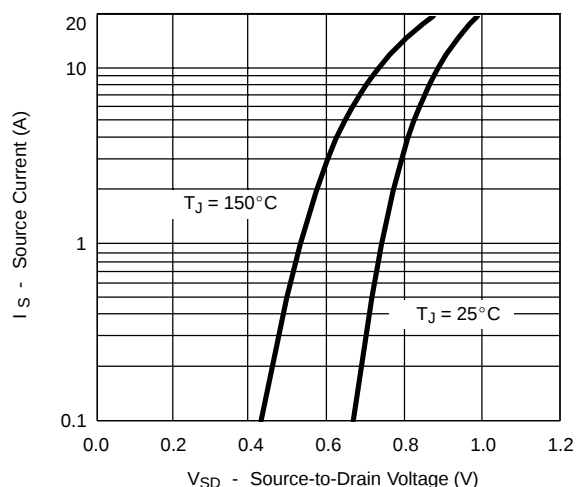
On-Resistance vs. Junction Temperature



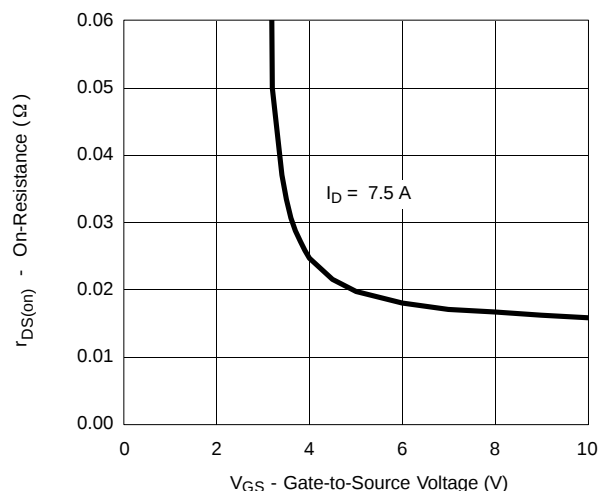
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL-1

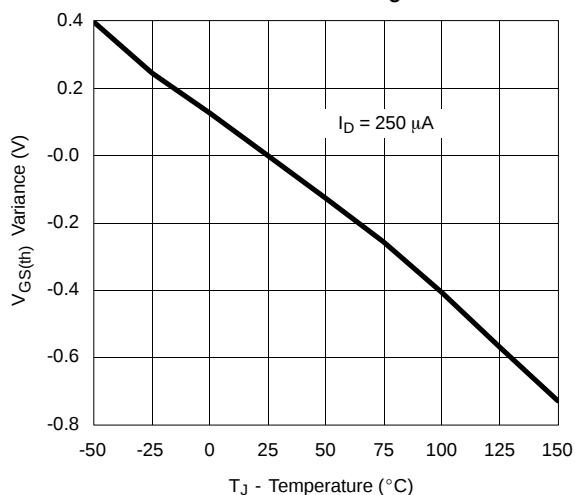
Source-Drain Diode Forward Voltage



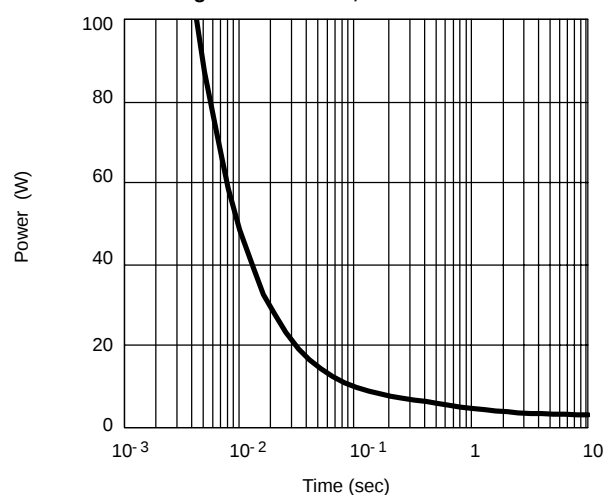
On-Resistance vs. Gate-to-Source Voltage



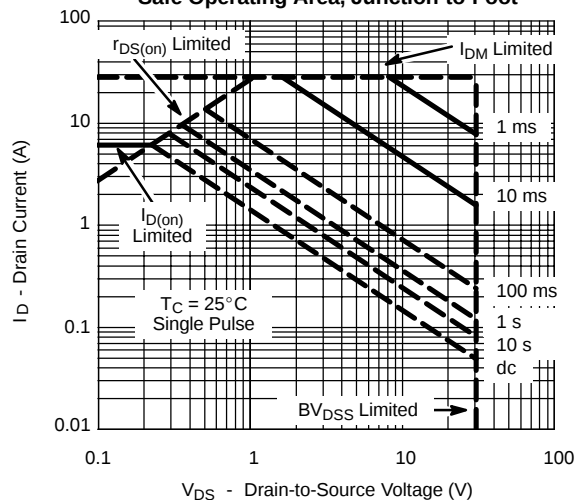
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Foot

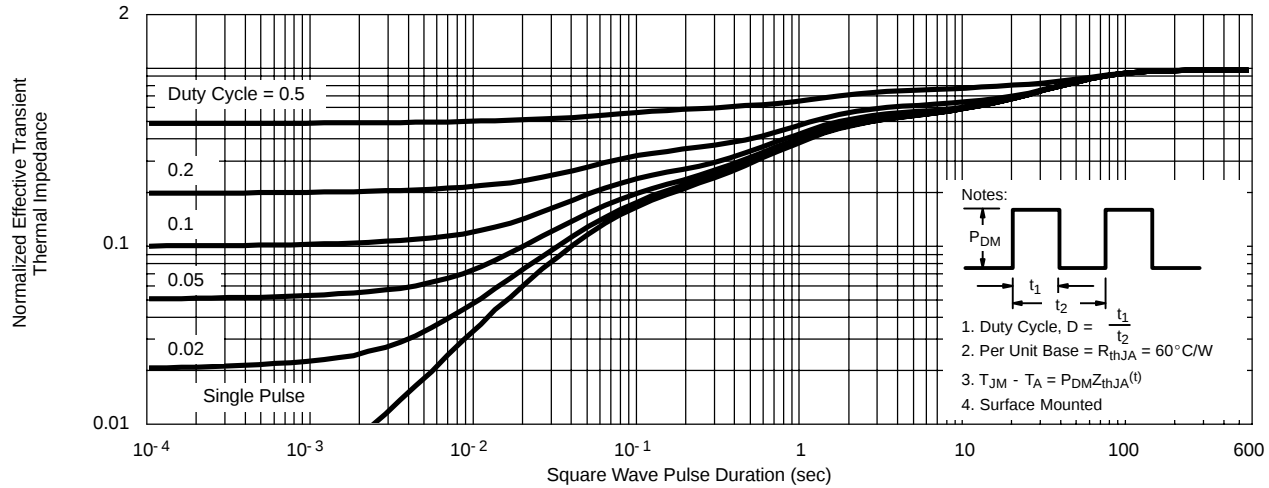




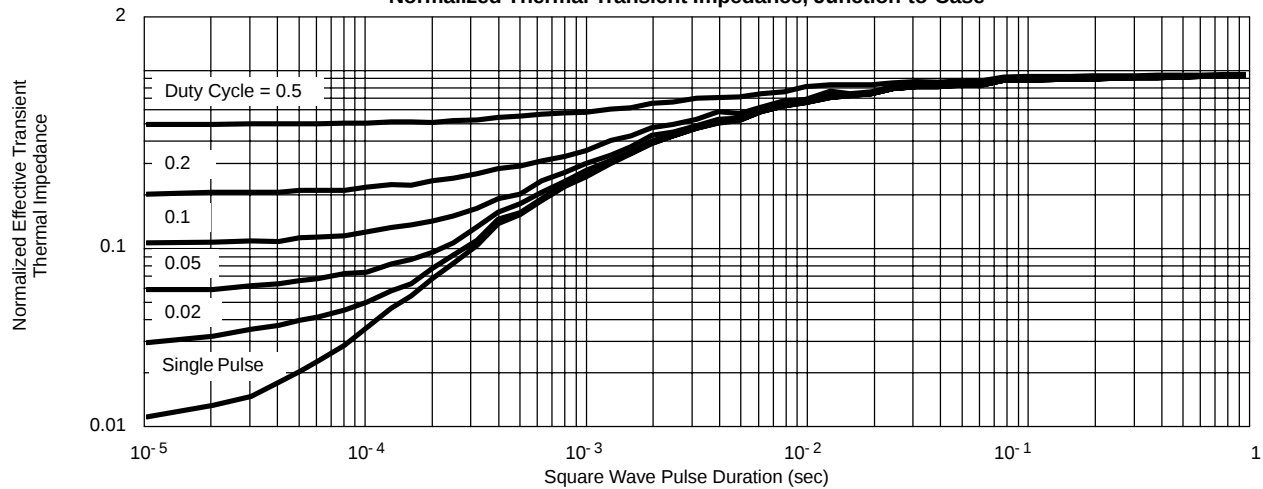
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL 1

Normalized Thermal Transient Impedance, Junction-to-Ambient



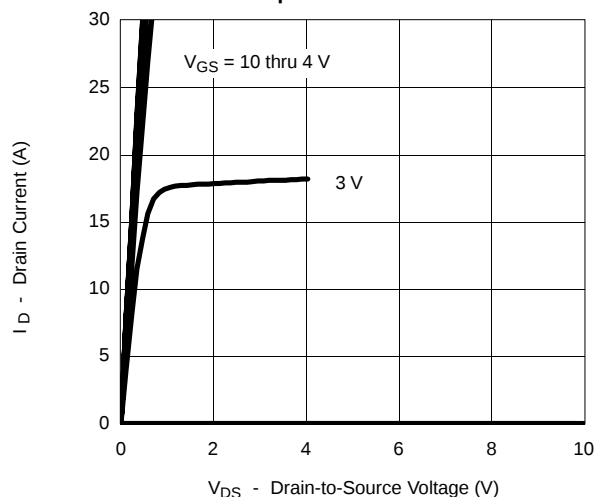
Normalized Thermal Transient Impedance, Junction-to-Case



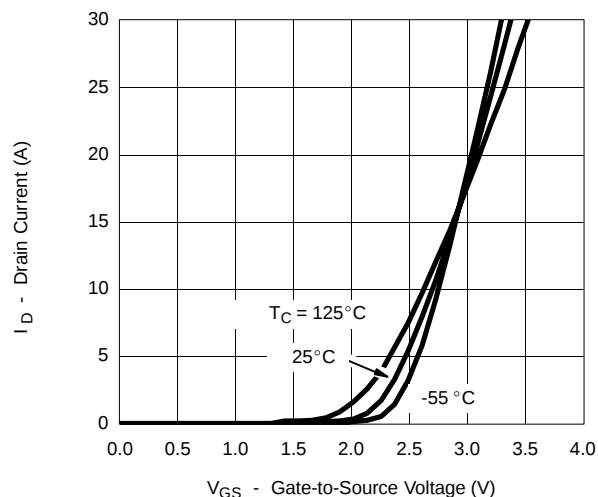
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL-2

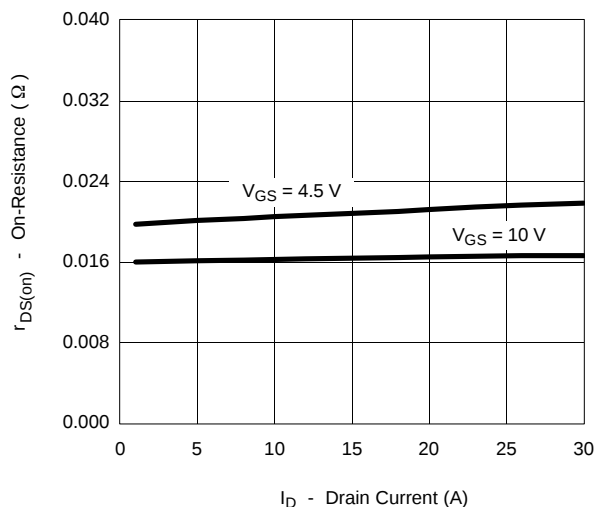
Output Characteristics



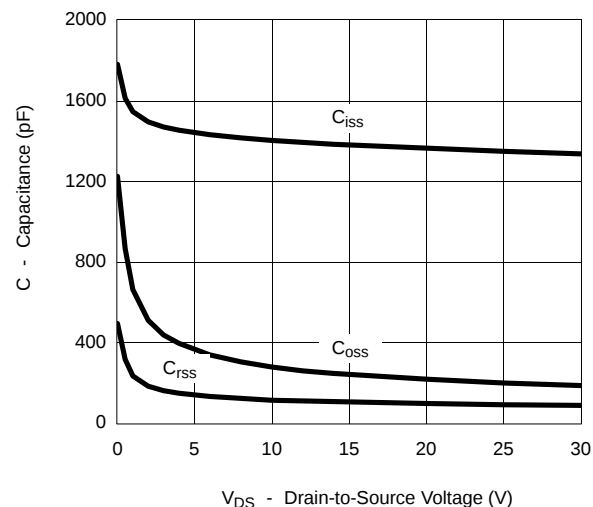
Transfer Characteristics



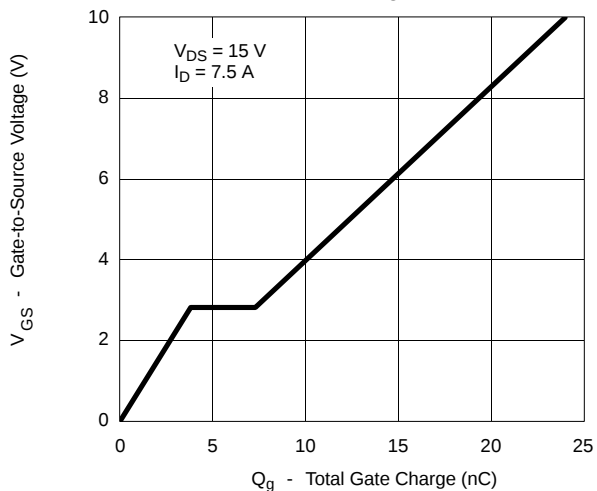
On-Resistance vs. Drain Current



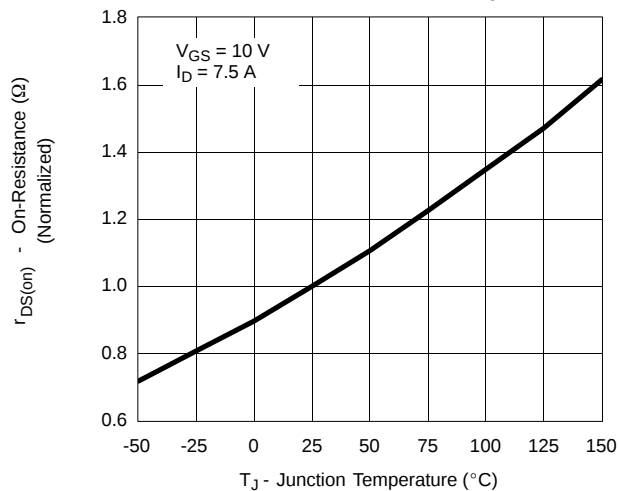
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

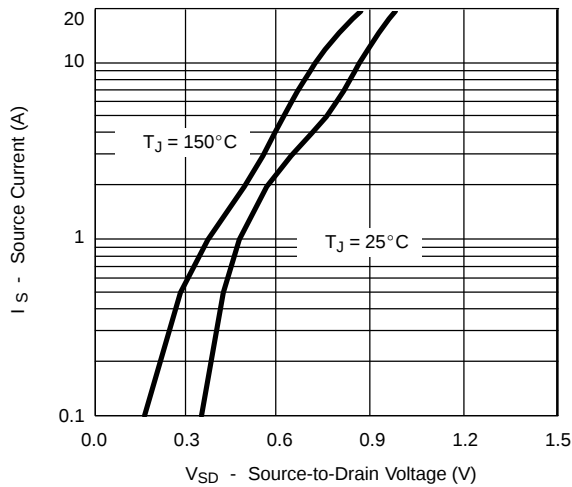




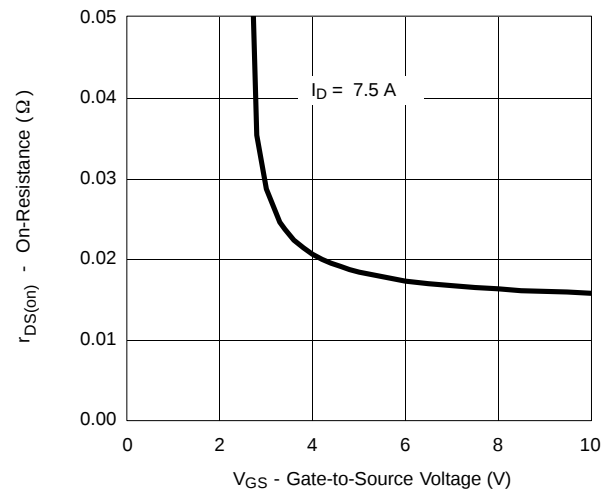
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL-2

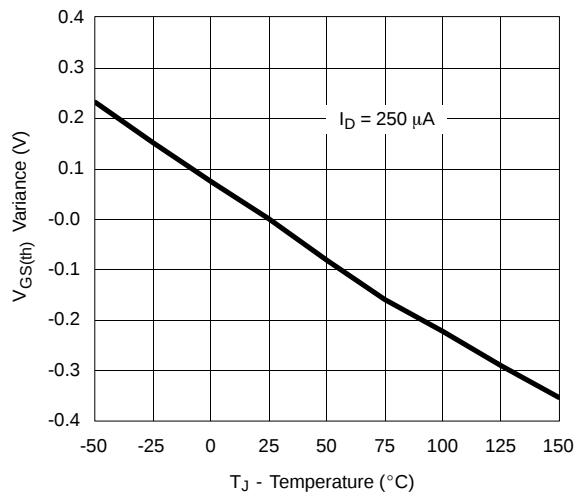
Source-Drain Diode Forward Voltage



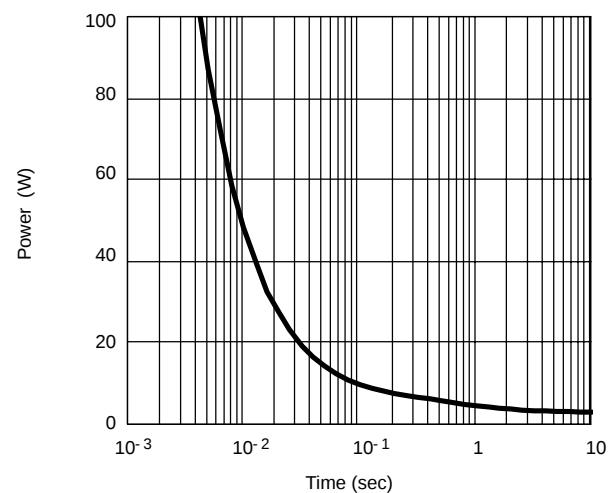
On-Resistance vs. Gate-to-Source Voltage



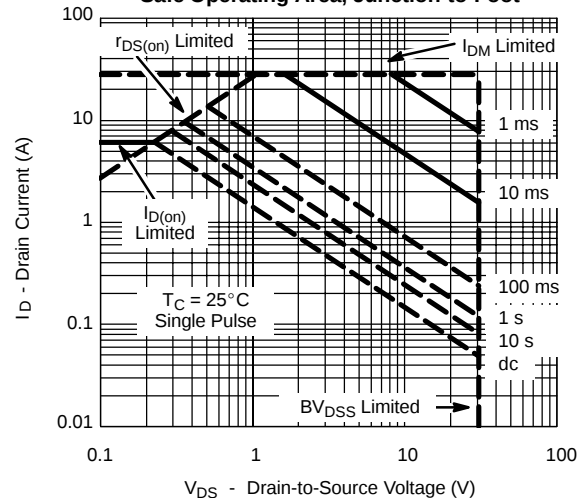
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



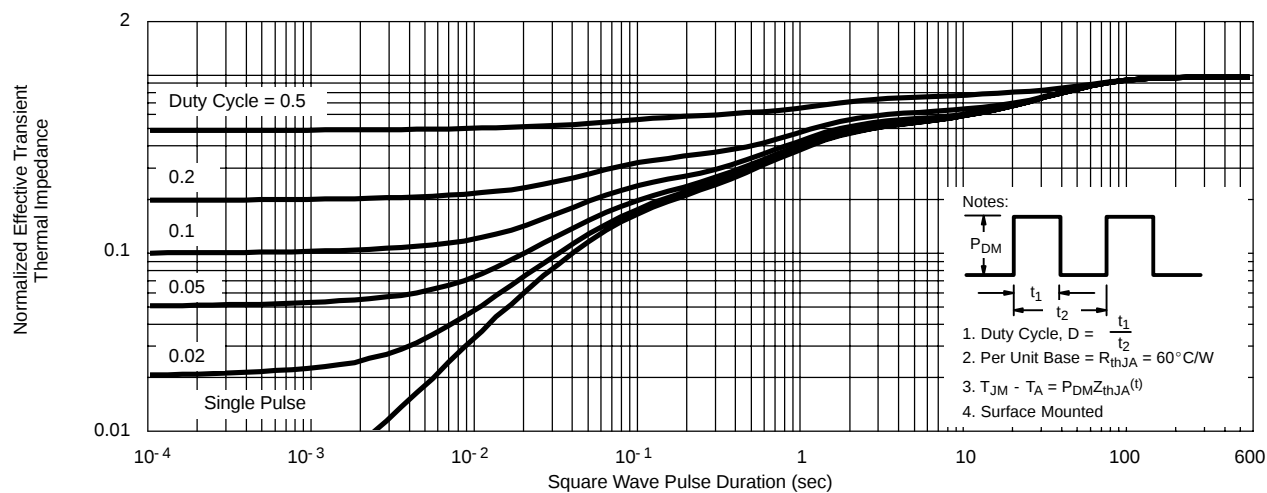
Safe Operating Area, Junction-to-Foot



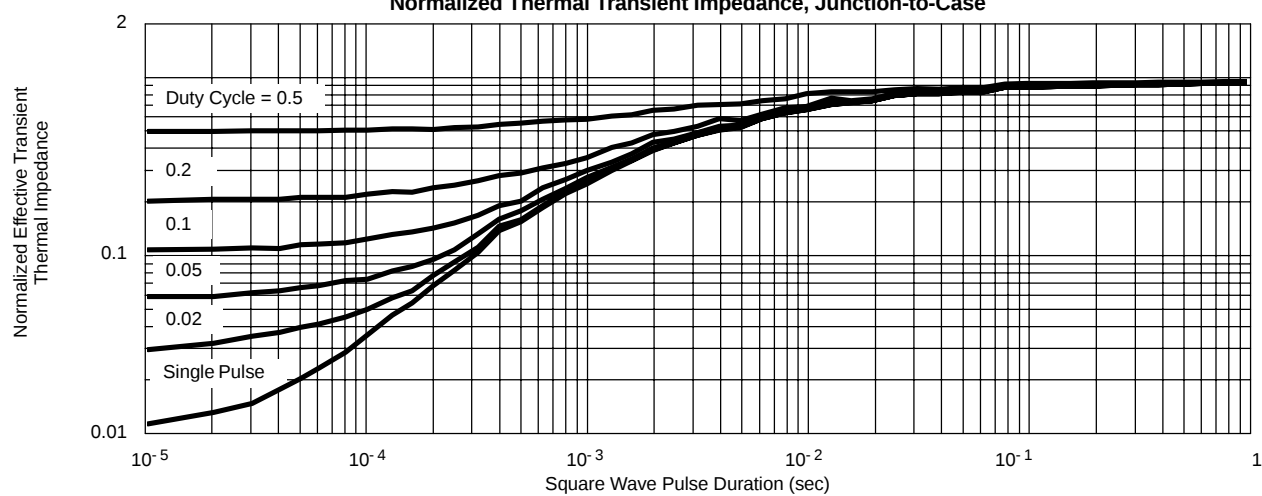
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET CHANNEL-2

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

SCHOTTKY

