

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

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.022 at $V_{GS} = 10$ V	7.5
	0.030 at $V_{GS} = 4.5$ V	6.5

SCHOTTKY PRODUCT SUMMARY

V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.50 at 1 A	2.0

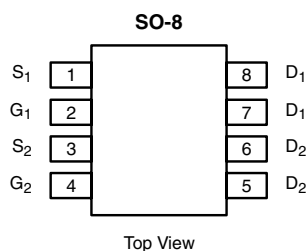
FEATURES

- LITTLE FOOT® Plus Schottky
- Si4830DY Pin Compatible
- PWM Optimized
- 100 % R_g Tested

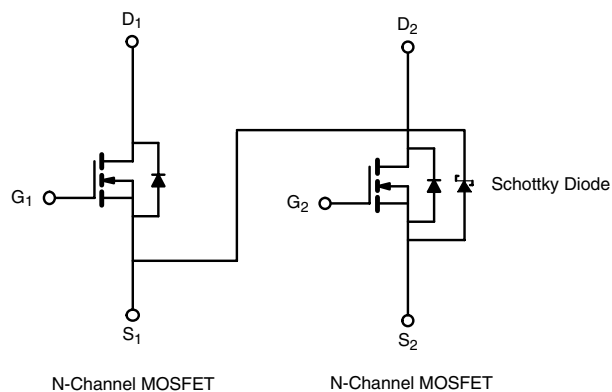

RoHS
COMPLIANT

APPLICATIONS

- Asymmetrical Buck-Boost DC/DC Converter



Ordering Information: Si4830ADY-T1-E3 (Lead (Pb)-free)



ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V_{DS}	30		V
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	7.5	5.7	A
		6.0	4.6	
Pulsed Drain Current	I_{DM}	30		
Continuous Source Current (Diode Conduction) ^a	I_S	1.7	0.9	
Maximum Power Dissipation ^a	P_D	2.0	1.1	W
		1.3	0.7	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	MOSFET		SCHOTTKY		Unit
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	52	62.5	53	62.5	$^\circ\text{C/W}$
	Steady State		93	110	93	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	35	40	35	40	

Notes:

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

MOSFET SPECIFICATIONS							
T _J = 25 °C, unless otherwise noted							
Parameter	Symbol	Test Conditions		Min	Typ ^a	Max	Unit
Static							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		1.4		3.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V				± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	Ch-1			1	μA
			Ch-2			100	
		V _{DS} = 30 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		20			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 7.5 A			0.017	0.022	Ω
		V _{GS} = 4.5 V, I _D = - 6.5 A			0.024	0.030	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 7.5 A			19		S
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			7	11	nC
Gate-Source Charge	Q _{gs}				2.9		
Gate-Drain Charge	Q _{gd}				2.5		
Gate Resistance	R _g			0.5	1.5	2.4	Ω
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			9	15	ns
Rise Time	t _r				10	17	
Turn-Off DelayTime	t _{d(off)}				19	30	
Fall Time	t _f				9	15	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 μs	Ch-1		35	55	
			Ch-2		32	55	

Notes:

a. Guaranteed by design, not subject to production testing.

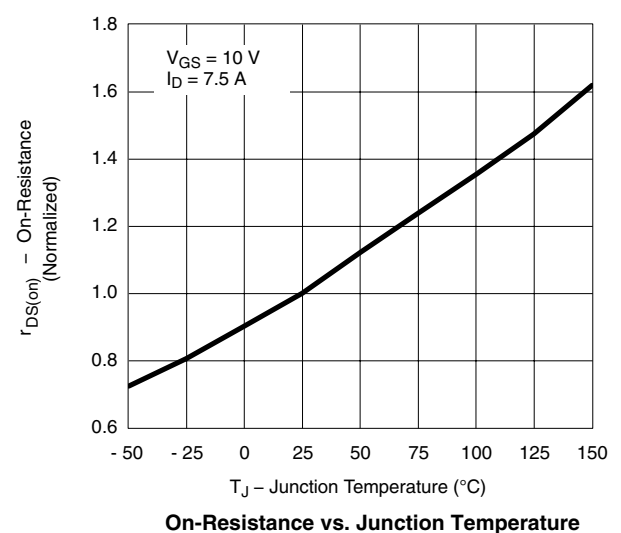
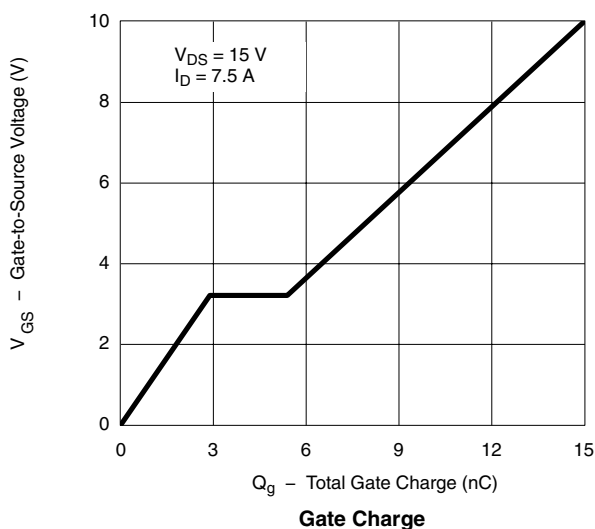
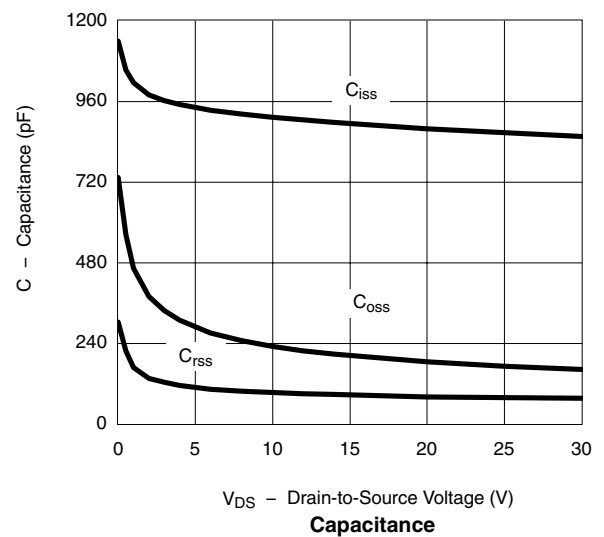
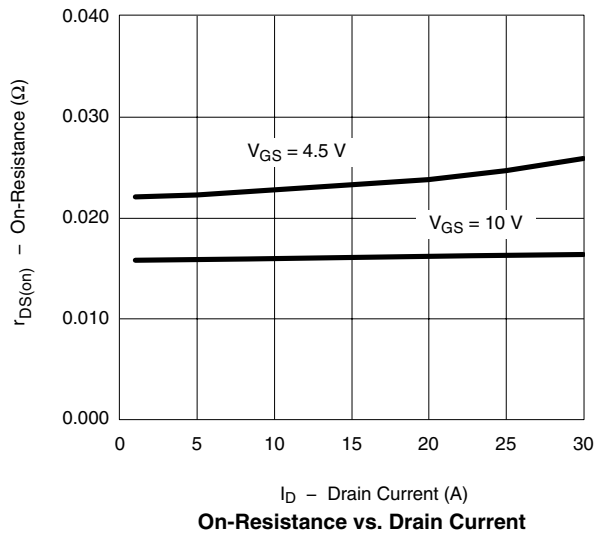
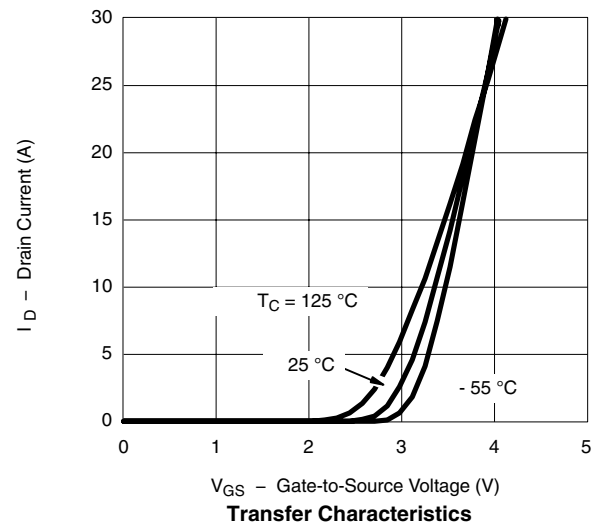
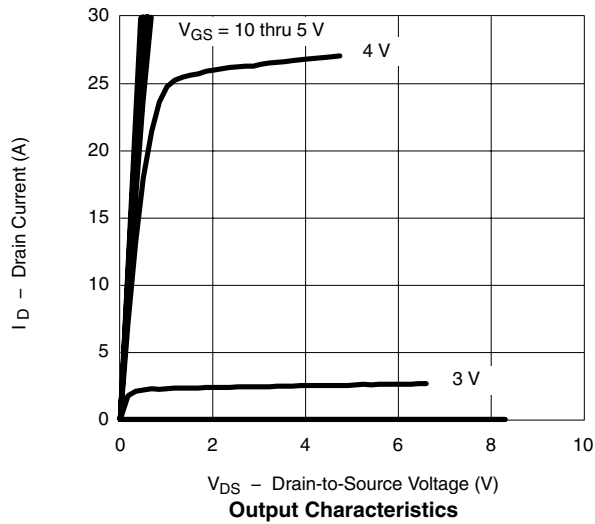
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

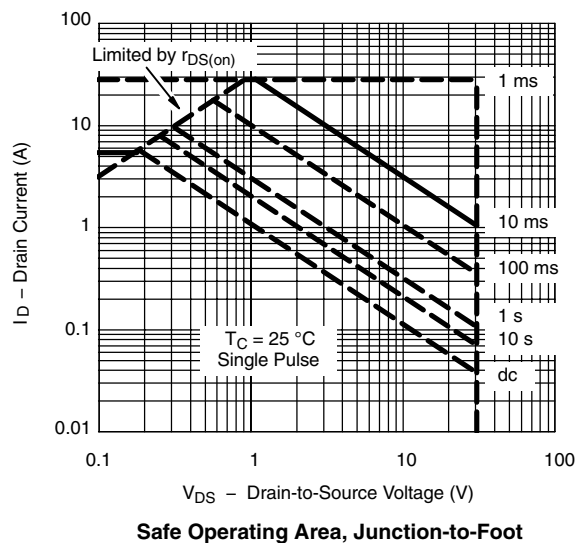
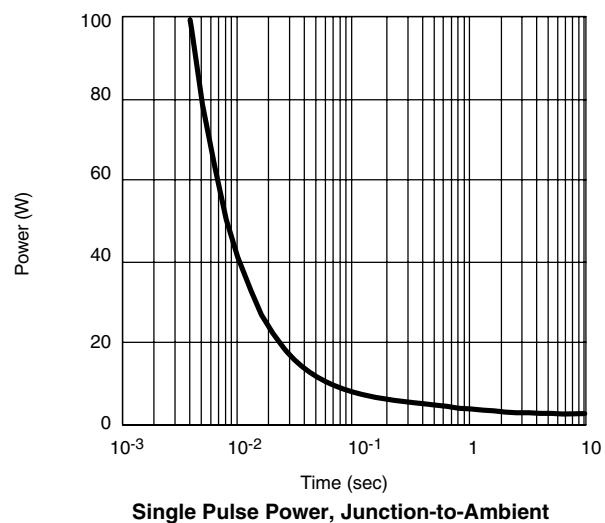
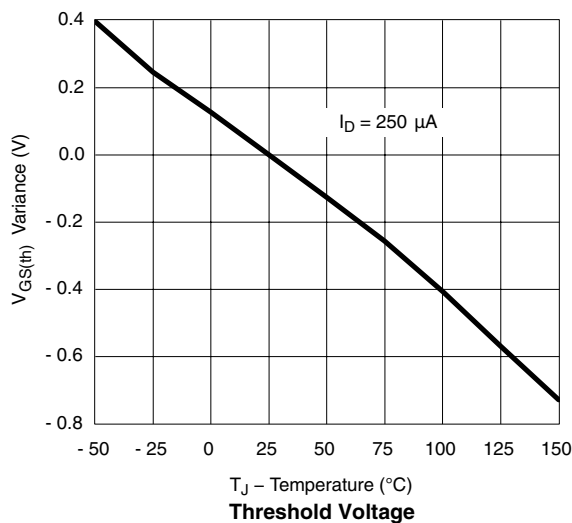
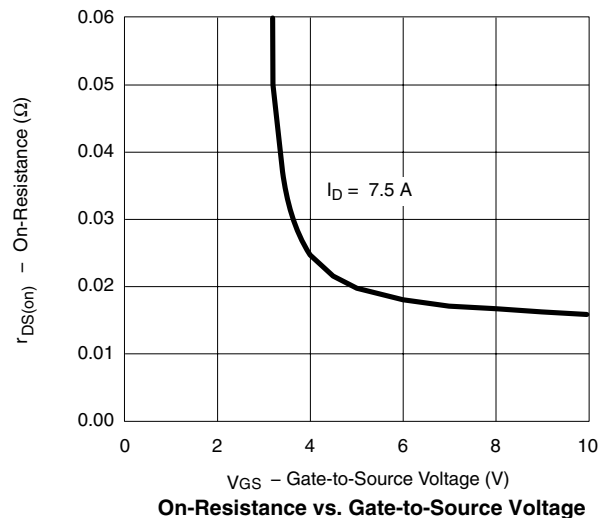
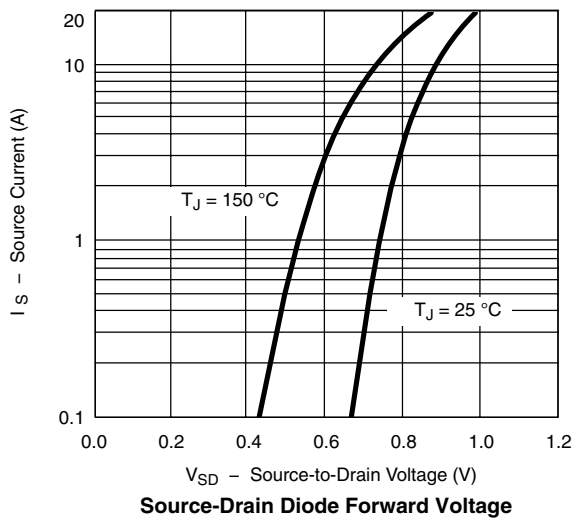
SCHOTTKY SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\text{ A}$		0.47	0.50	V
		$I_F = 1.0\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current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

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

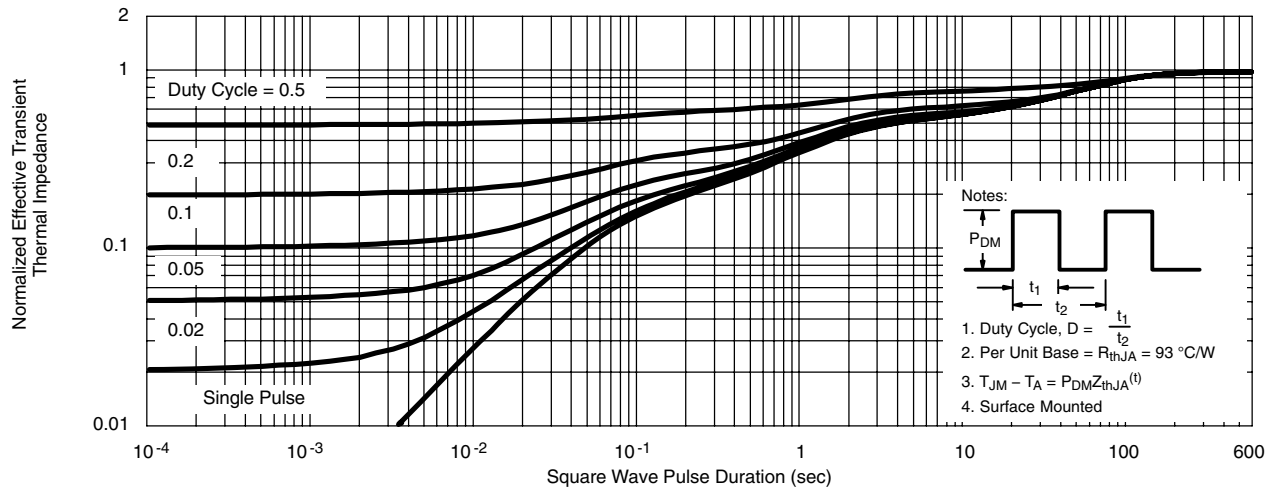


MOSFET TYPICAL CHARACTERISTICS 25 °C unless noted

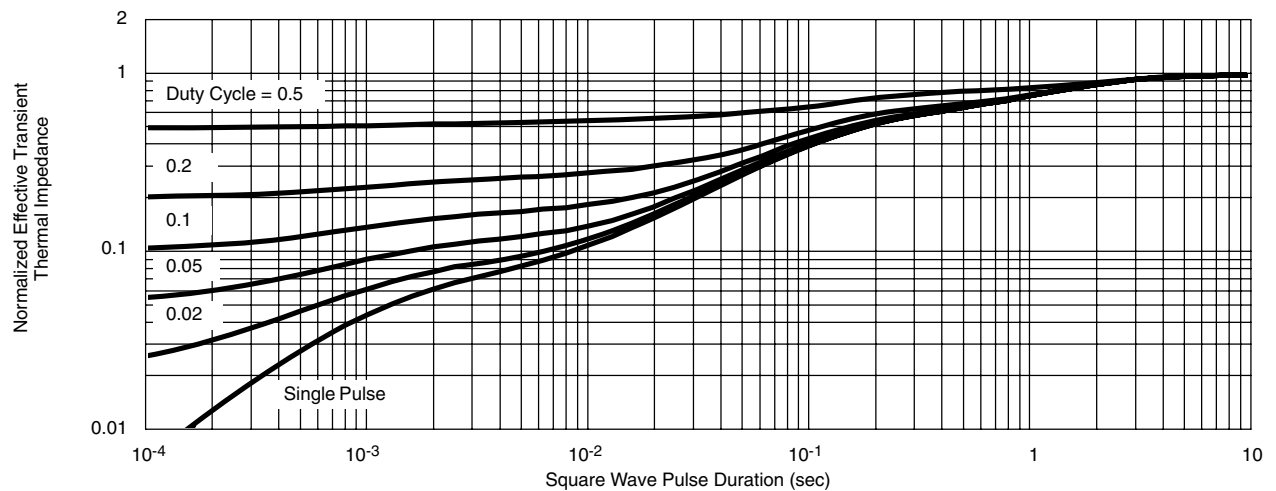


MOSFET TYPICAL CHARACTERISTICS 25 °C unless noted

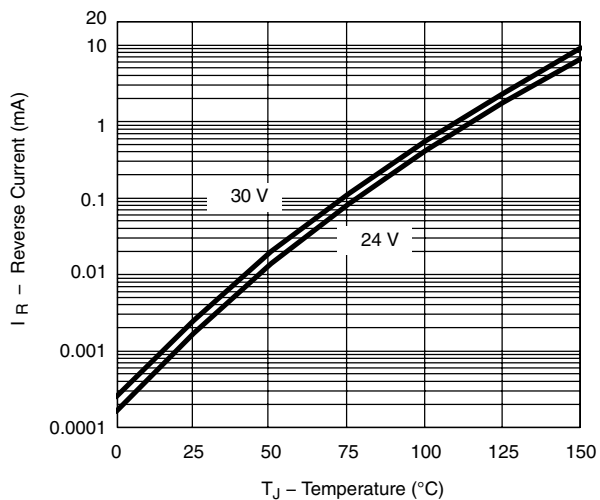
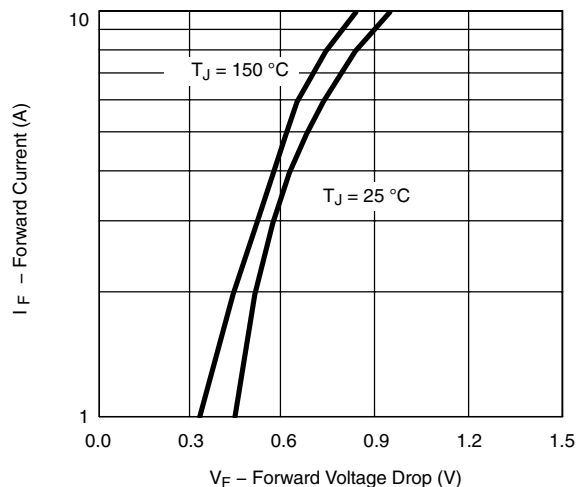
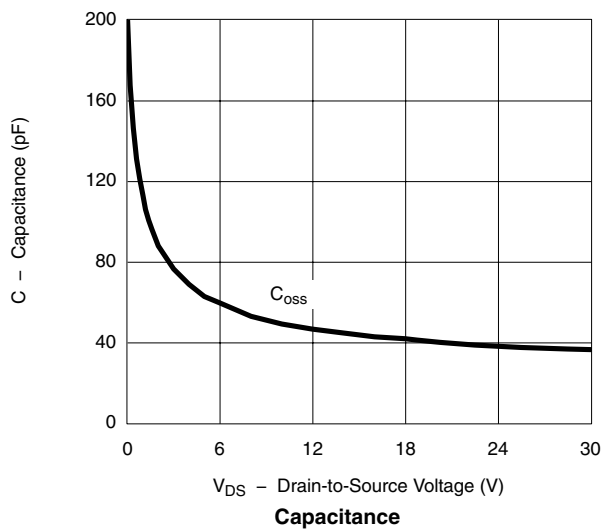
MOSFET TYPICAL CHARACTERISTICS 25 °C unless noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

MOSFET TYPICAL CHARACTERISTICS 25 °C unless noted**Reverse Current vs. Junction Temperature****Forward Voltage Drop****Capacitance**

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