P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.039 @ V_{GS} = -4.5 V	-4.7
	0.052 @ V_{GS} = -2.5 V	- 4.1
	0.068 @ V_{GS} = -1.8 V	- 3.5

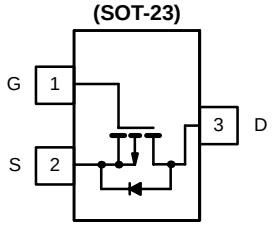
FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch
- PA Switch

TO-236
(SOT-23)



Top View
Si2323DS (D3)*
*Marking Code

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a, b]	T_A = 25°C	I_D	- 4.7	-3.7	A
	T_A = 70°C		-3.8	-2.9	
Pulsed Drain Current		I_{DM}	-20		
Continuous Source Current (Diode Conduction)[a, b]		I_S	-1.0	-0.6	
Maximum Power Dissipation[a, b]	T_A = 25°C	P_D	1.25	0.75	W
	T_A = 70°C		0.8	0.48	
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 ≤ 5 sec	R_{thJA}	75	100	°C/W
	Steady State		120	166	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40	50	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.
b. Pulse width limited by maximum junction temperature.

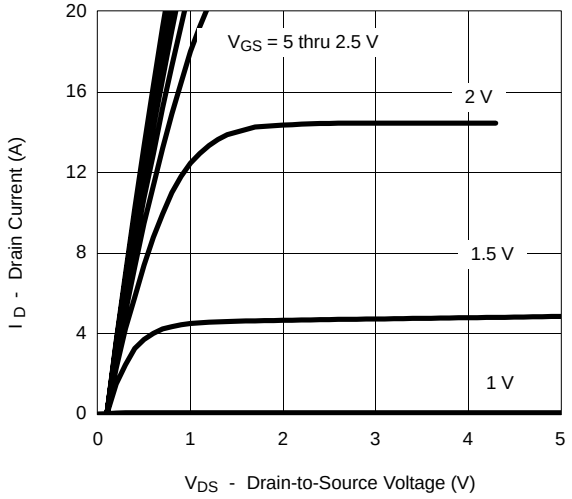
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = -250 µA	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-0.40		-1.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16 V, V_{GS} = 0 V			-1	µA
		V_{DS} = -16 V, V_{GS} = 0 V, T_J = 55°C			-10	µA
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ -5 V, V_{GS} = -4.5 V	-20			A
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -4.7 A		0.031	0.039	Ω
		V_{GS} = -2.5 V, I_D = -4.1 A		0.041	0.052	Ω
		V_{GS} = -1.8 V, I_D = -2.0 A		0.054	0.068	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = -5 V, I_D = -4.7 A		16		S
Diode Forward Voltage	V_{SD}	I_S = -1.0 A, V_{GS} = 0 V		0.7	-1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -10 V, V_{GS} = -4.5 V I_D ≅ -4.7 A		12.5	19	nC
Gate-Source Charge	Q_{gs}			1.7		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
Input Capacitance	C_{iss}	V_{DS} = -10 V, V_{GS} = 0, f = 1 MHz		1020		pF
Output Capacitance	C_{oss}			191		pF
Reverse Transfer Capacitance	C_{rss}			140		pF
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = -10 V, R_L = 10 Ω I_D ≅ -1.0 A, V_{GEN} = -4.5 V R_G = 6 Ω		25	40	ns
	t_r			43	65	ns
Turn-Off Time	$t_{d(off)}$			71	110	ns
	t_f			48	75	ns

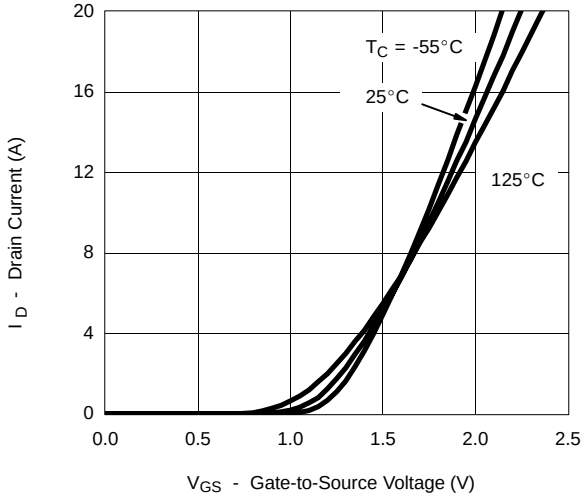
Notes
a. Pulse test: PW ≤300 µs duty cycle ≤2%.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

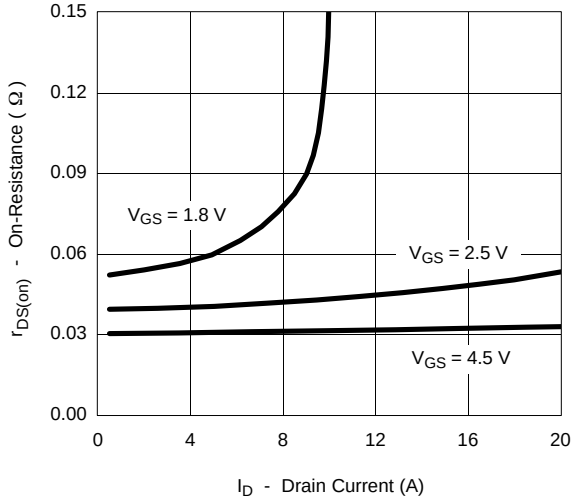
Output Characteristics



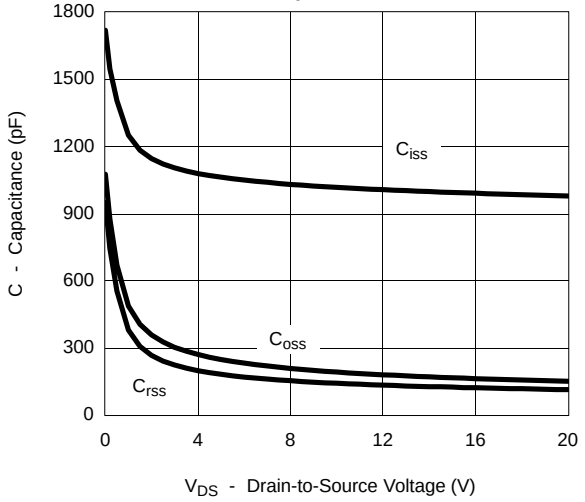
Transfer Characteristics



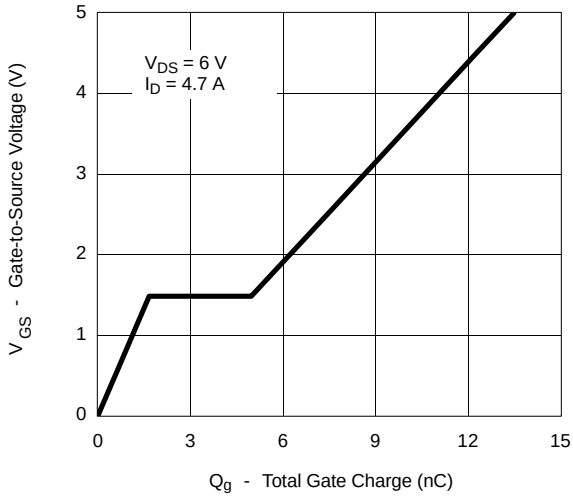
On-Resistance vs. Drain Current



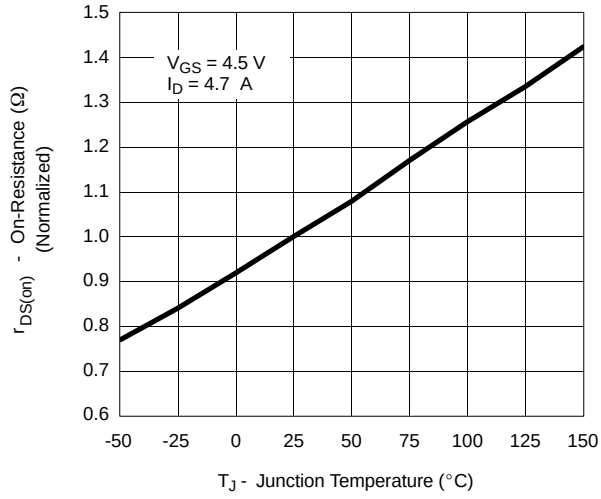
Capacitance



Gate Charge

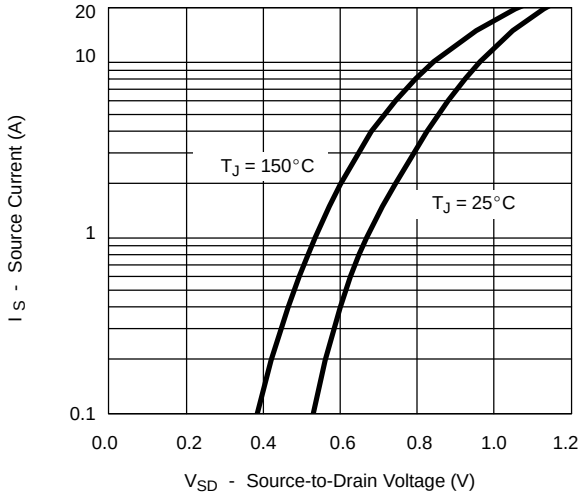


On-Resistance vs. Junction Temperature

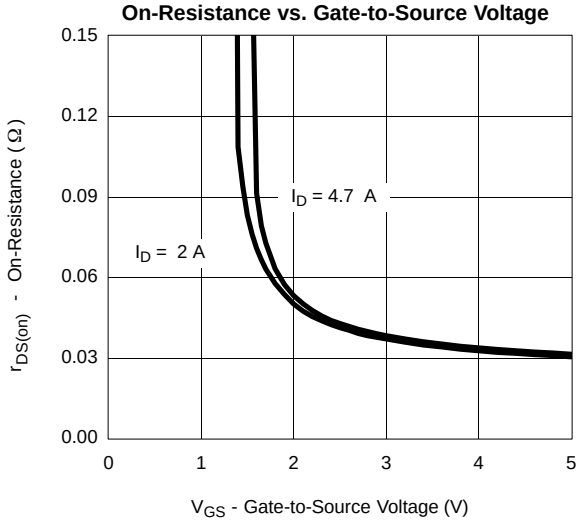


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

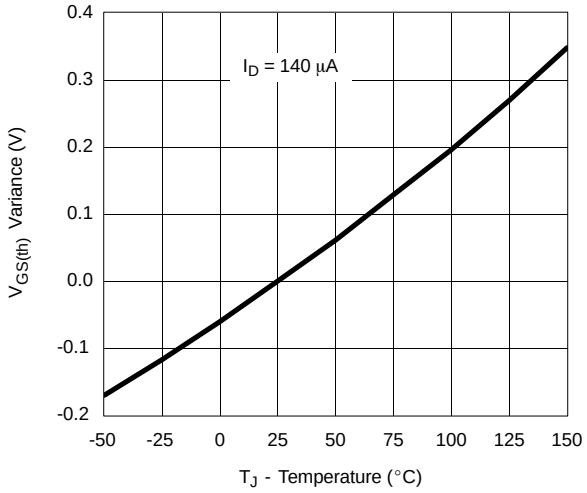
Source-Drain Diode Forward Voltage



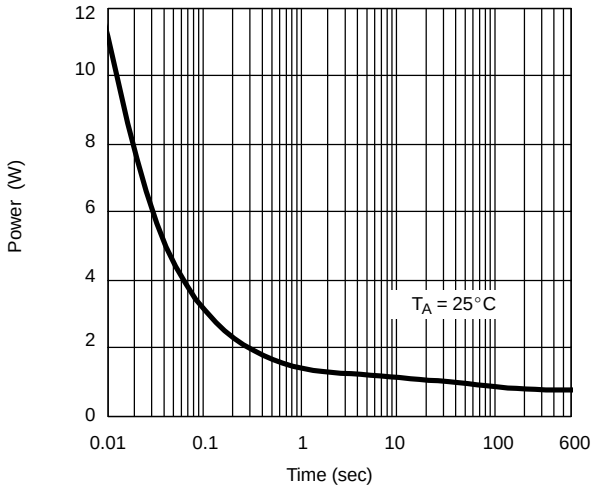
On-Resistance vs. Gate-to-Source Voltage



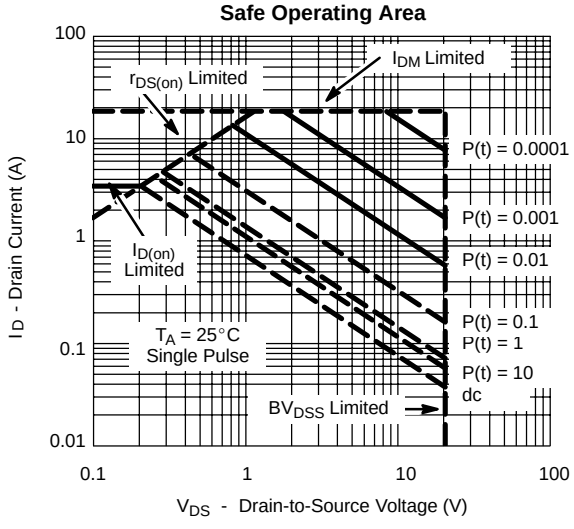
Threshold Voltage



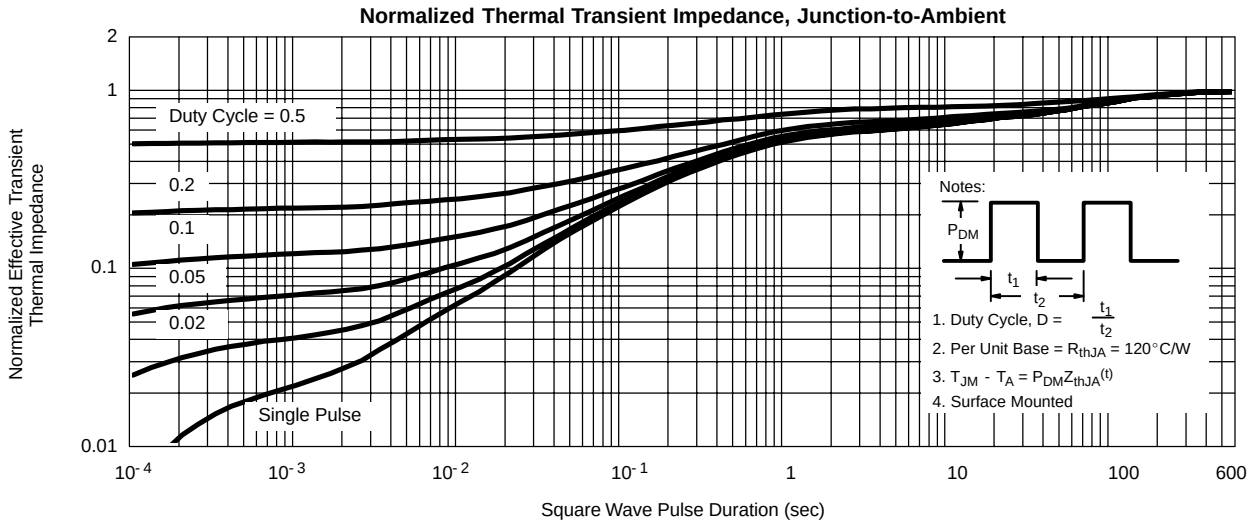
Single Pulse Power



Safe Operating Area



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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