

N-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY

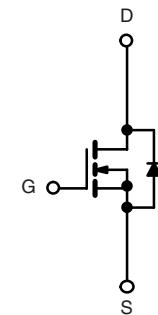
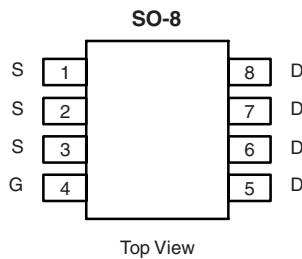
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
12	0.003 at $V_{GS} = 4.5$ V	25
	0.004 at $V_{GS} = 2.5$ V	20

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFETs: 2.5 V Rated
- 100 % R_g Tested



RoHS
COMPLIANT
HALOGEN
FREE
Available



Ordering Information: Si4838DY-T1-E3 (Lead (Pb)-free)
Si4838DY-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	10 s	Steady State	Unit
Drain-Source Voltage	V_{DS}	12	± 8	V
Gate-Source Voltage	V_{GS}			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	25	17	A
		20	13	
Pulsed Drain Current (10 μ s Pulse Width)	I_{DM}	60		A
Continuous Source Current (Diode Conduction) ^a	I_S	2.9	1.3	
Maximum Power Dissipation ^a	P_D	3.5	1.6	W
		2.2	1	
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	R_{thJA}	29	35	°C/W
Steady State		67	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	13	16	

Notes:

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

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	0.6			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 8 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 9.6 \text{ V}$, $V_{GS} = 0 \text{ V}$		1		μA
		$V_{DS} = 9.6 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 55^\circ\text{C}$		5		
		$V_{DS} \geq 5 \text{ V}$, $V_{GS} = 4.5 \text{ V}$	30			
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{GS} = 4.5 \text{ V}$, $I_D = 25 \text{ A}$		0.0024	0.003	Ω
		$V_{GS} = 2.5 \text{ V}$, $I_D = 20 \text{ A}$		0.0031	0.004	
		$V_{DS} = 6 \text{ V}$, $I_D = 25 \text{ A}$		80		
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.9 \text{ A}$, $V_{GS} = 0 \text{ V}$		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 6 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 25 \text{ A}$		40	60	nC
Gate-Source Charge	Q_{gs}			6.7		
Gate-Drain Charge	Q_{gd}			9.2		
Gate Resistance	R_g		1.0	1.7	2.9	Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = 6 \text{ V}$, $R_L = 6 \Omega$ $I_D \geq 1 \text{ A}$, $V_{GEN} = 4.5 \text{ V}$, $R_g = 6 \Omega$		40	60	ns
Rise Time	t_r			40	60	
Turn-Off Delay Time	$t_{d(\text{off})}$			140	210	
Fall Time	t_f			70	100	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.9 \text{ A}$, $dl/dt = 100 \text{ A}/\mu\text{s}$		50	80	

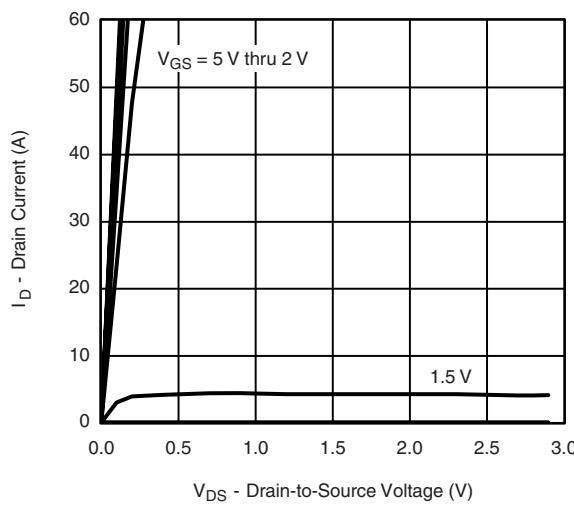
Notes:

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

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

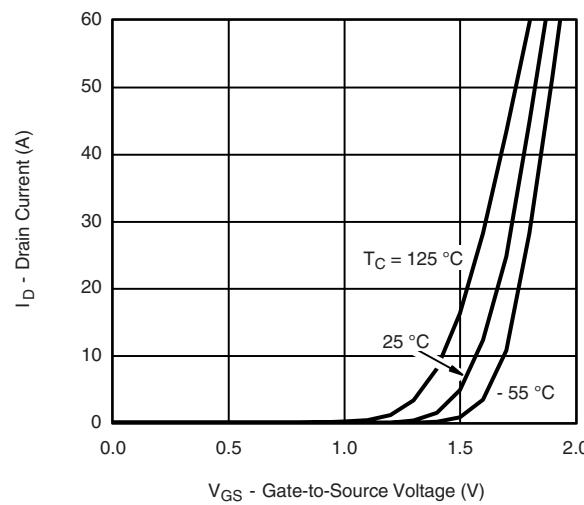
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS 25°C , unless otherwise noted



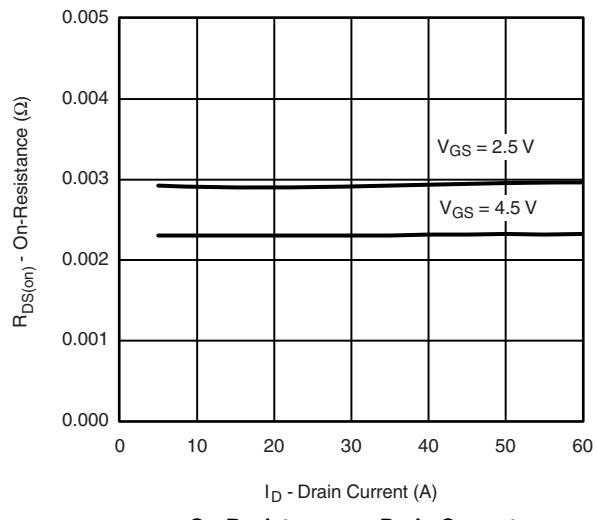
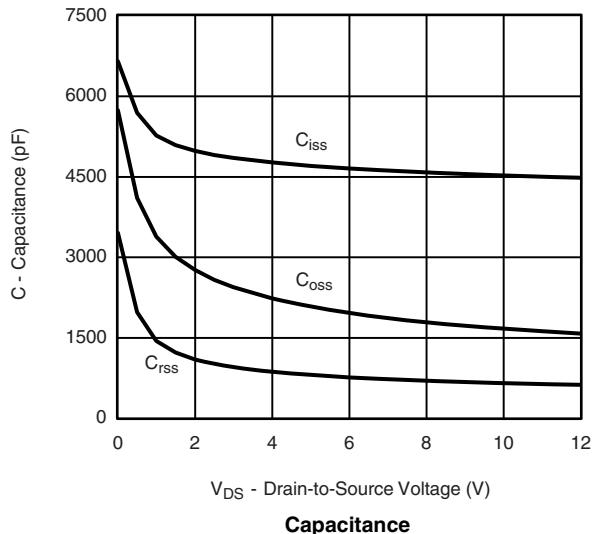
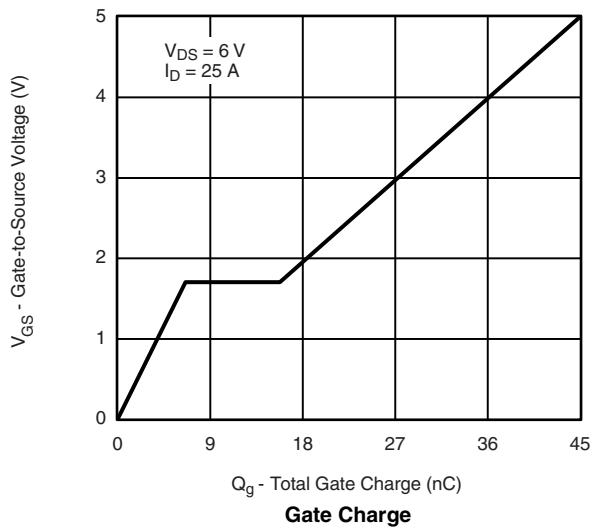
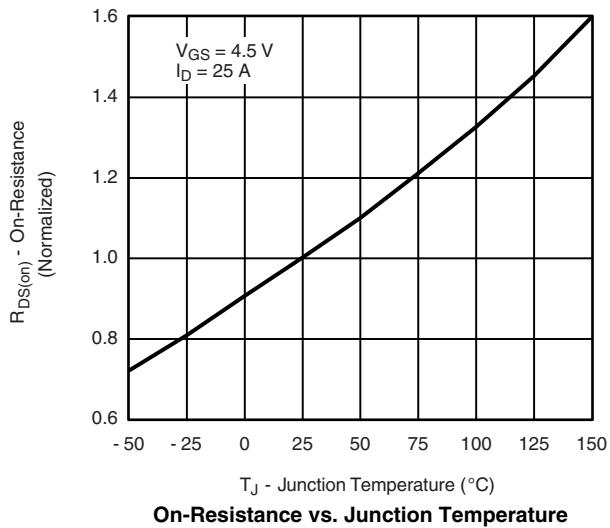
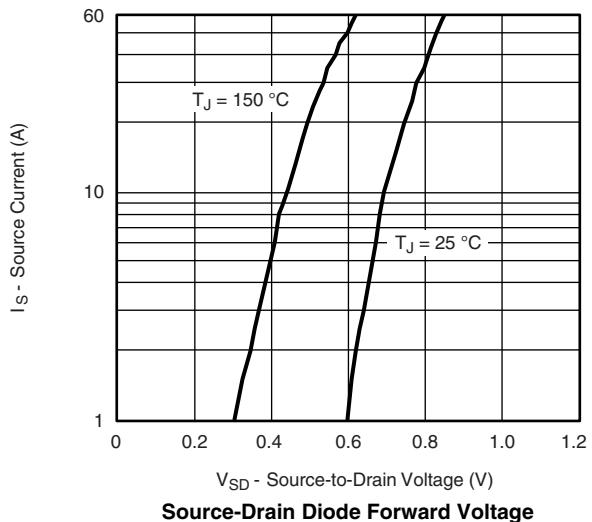
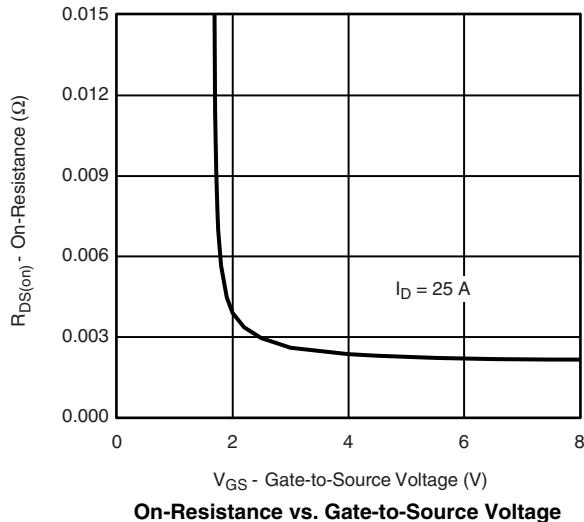
V_{GS} - Gate-to-Source Voltage (V)

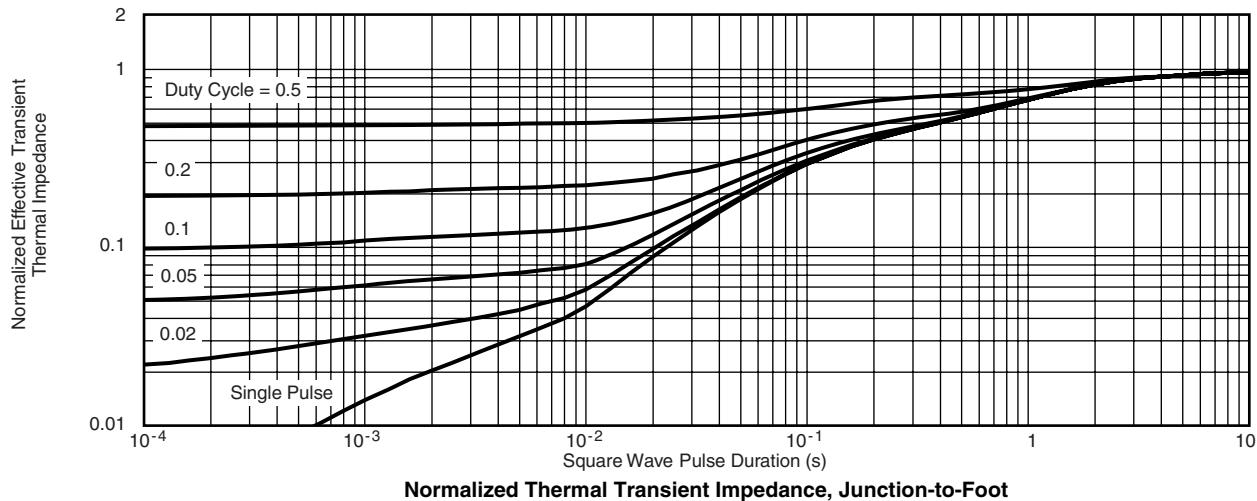
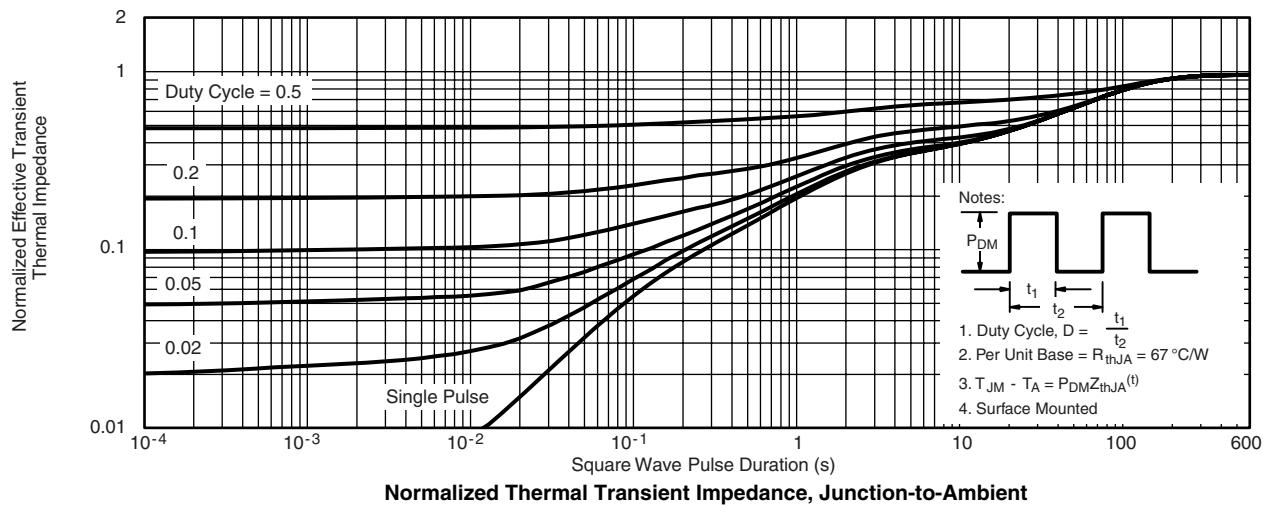
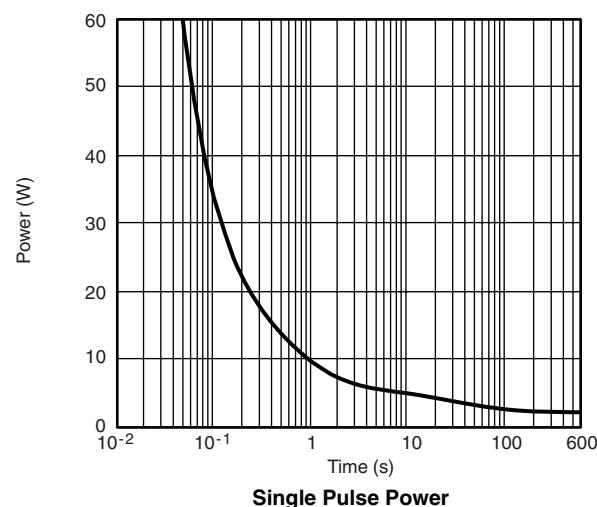
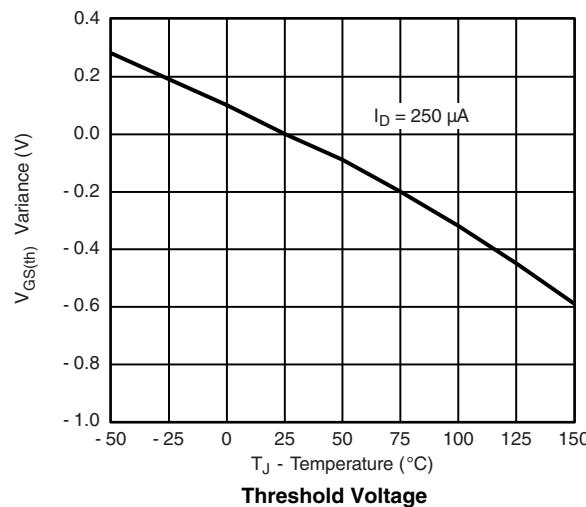
Output Characteristics



V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics

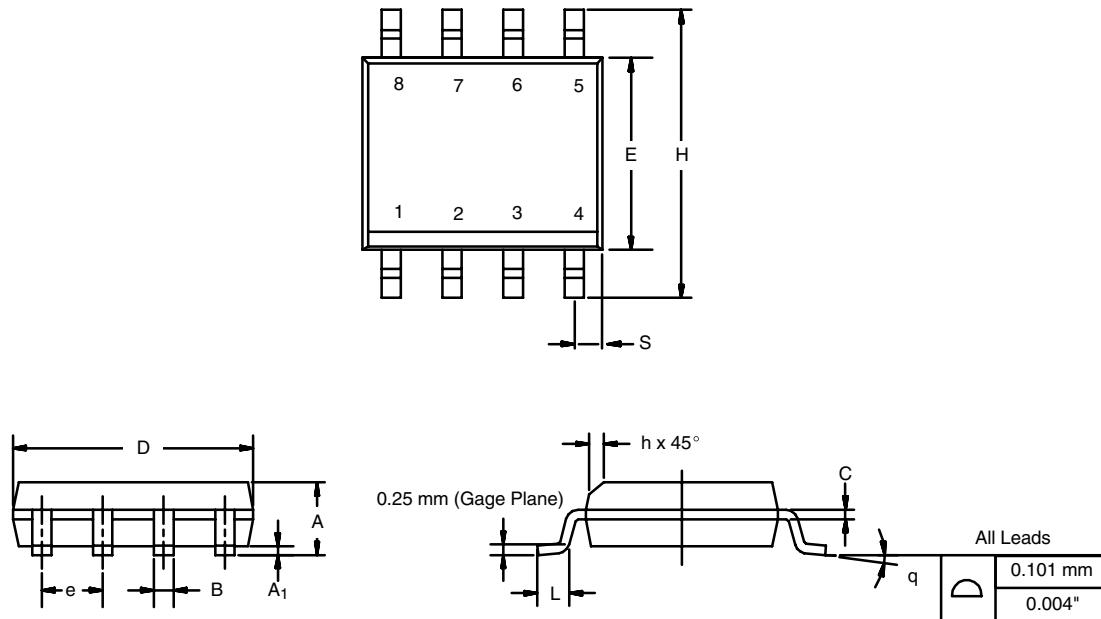
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


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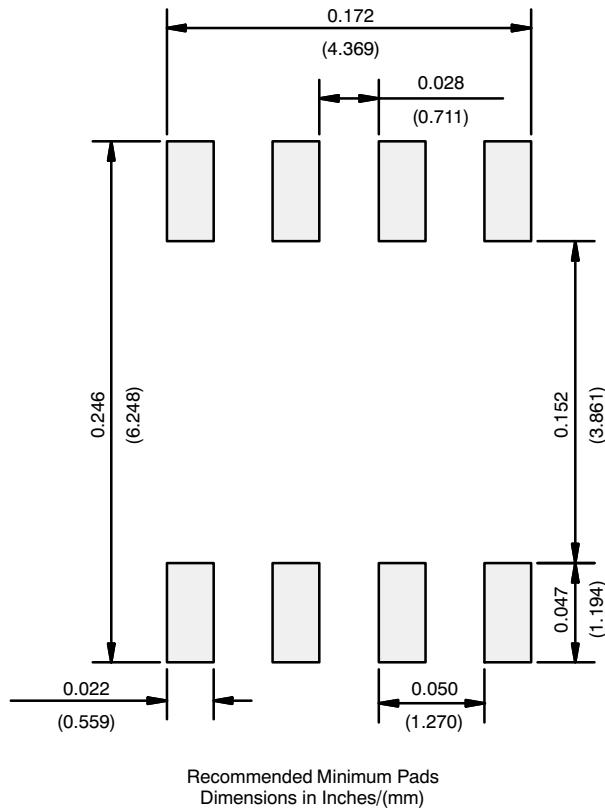
SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				

RECOMMENDED MINIMUM PADS FOR SO-8



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