



## P-Channel 12-V (D-S) MOSFET

## PRODUCT SUMMARY

$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
- 12	0.085 at $V_{GS} = - 4.5$ V	- 3.3
	0.115 at $V_{GS} = - 2.5$ V	- 2.9
	0.160 at $V_{GS} = - 1.8$ V	- 2.4

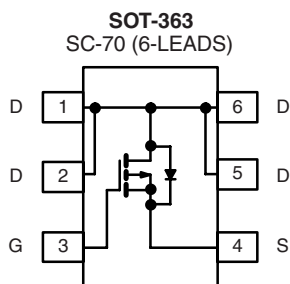
## FEATURES

- TrenchFET® Power MOSFETS: 1.8 V Rated
- Thermally Enhanced SC-70 Package

RoHS\*  
COMPLIANT

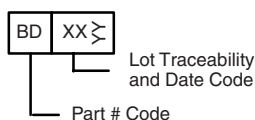
## APPLICATIONS

- Load Switching
- PA Switch
- Level Switch



Ordering Information: Si1417DH-T1  
Si1417DH-T1-E3 (Lead (Pb)-free)

## Marking Code

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

ABSOLUTE MAXIMUM RATINGS						T <sub>A</sub> = 25 °C, unless otherwise noted	
Parameter			Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage			V <sub>DS</sub>	- 12		V	
Gate-Source Voltage			V <sub>GS</sub>	± 8			
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	T <sub>A</sub> = 25 °C		I <sub>D</sub>	- 3.3	- 2.7	A	
	T <sub>A</sub> = 85 °C			- 2.4	- 1.9		
Pulsed Drain Current			I <sub>DM</sub>	- 8			
Continuous Diode Current (Diode Conduction) <sup>a</sup>			I <sub>S</sub>	- 1.4	- 0.9		
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25 °C		P <sub>D</sub>	1.56	1.0	W	
	T <sub>A</sub> = 85 °C			0.81	0.52		
Operating Junction and Storage Temperature Range			T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150		°C	

## THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	60	80	$^\circ\text{C/W}$
	Steady State		100	125	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	34	45	

Notes:

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

\* Pb containing terminations are not RoHS compliant, exemptions may apply.

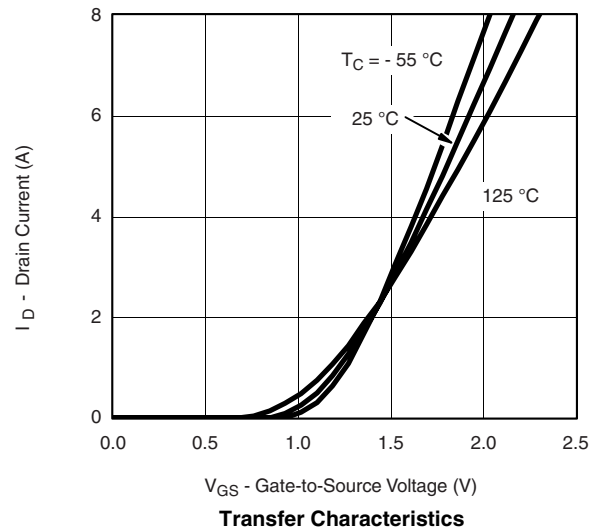
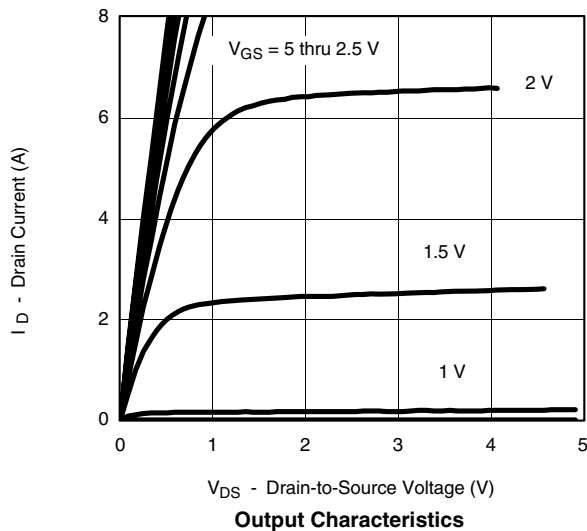
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\text{ }\mu\text{A}$	-0.45		-0.8	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 8\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -9.6\text{ V}$ , $V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -9.6\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 85\text{ }^{\circ}\text{C}$			-5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}$ , $V_{GS} = -4.5\text{ V}$	-4			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}$ , $I_D = -3.3\text{ A}$		0.070	0.085	$\Omega$
		$V_{GS} = -2.5\text{ V}$ , $I_D = -2.9\text{ A}$		0.095	0.115	
		$V_{GS} = -1.8\text{ V}$ , $I_D = -1.0\text{ A}$		0.133	0.160	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -10\text{ V}$ , $I_D = -3.3\text{ A}$		8		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -1.4\text{ A}$ , $V_{GS} = 0\text{ V}$		-0.80	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -6\text{ V}$ , $V_{GS} = -4.5\text{ V}$ , $I_D = -3.3\text{ A}$		7.0	10.5	nC
Gate-Source Charge	$Q_{gs}$			1.3		
Gate-Drain Charge	$Q_{gd}$			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}$ , $R_L = 6\text{ }\Omega$ $I_D \cong -1\text{ A}$ , $V_{GEN} = -4.5\text{ V}$ , $R_G = 6\text{ }\Omega$		18	30	ns
Rise Time	$t_r$			28	45	
Turn-Off Delay Time	$t_{d(off)}$			41	65	
Fall Time	$t_f$			60	90	

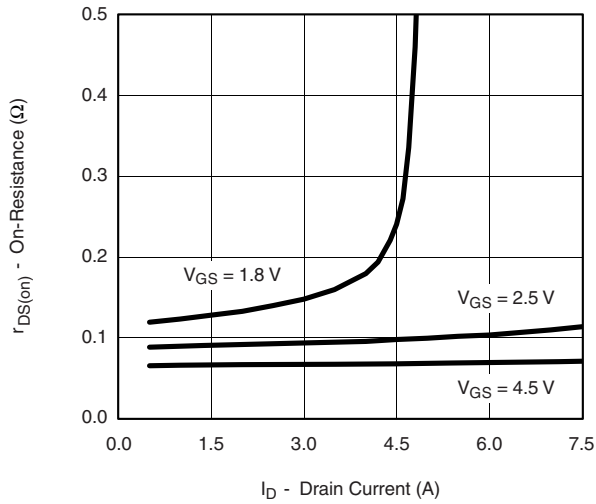
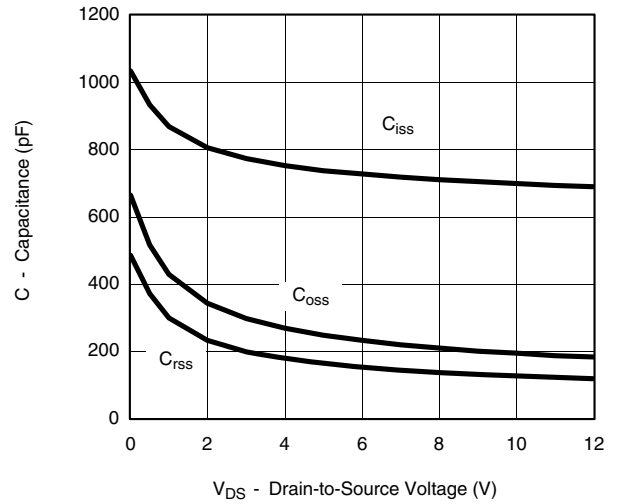
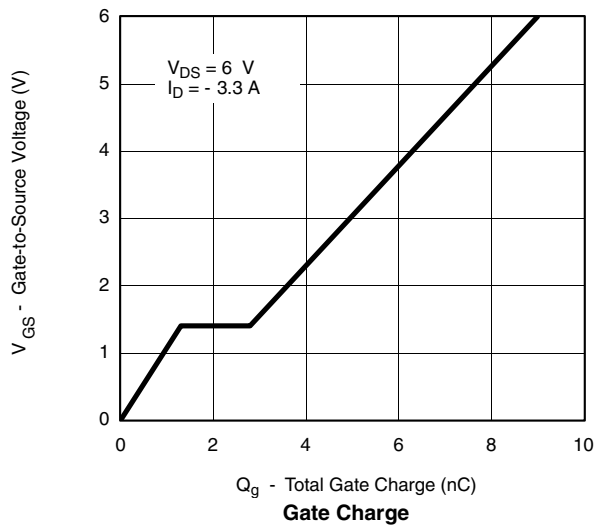
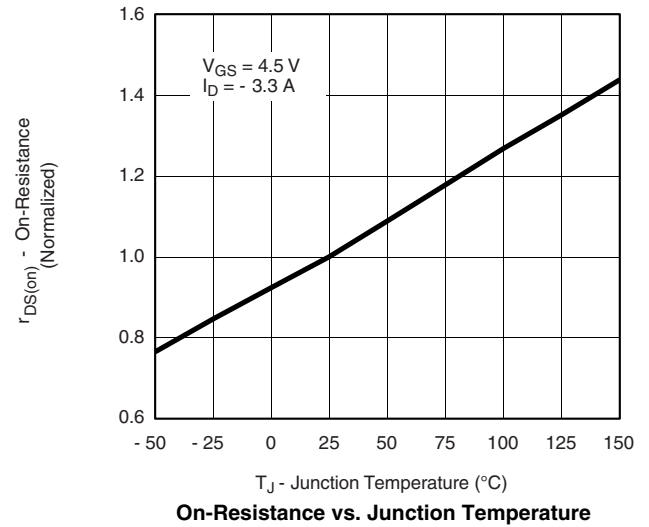
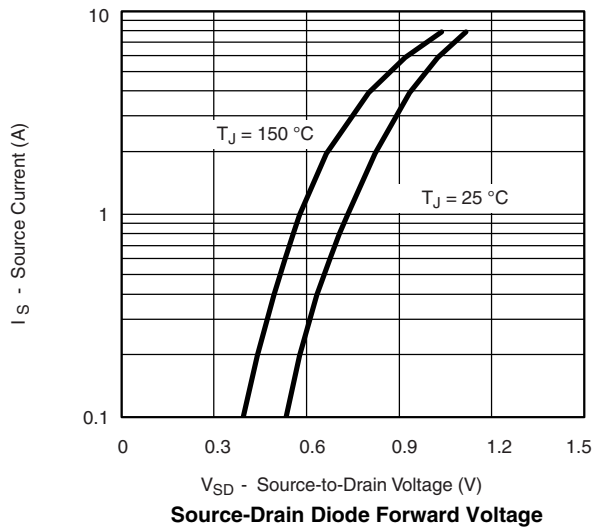
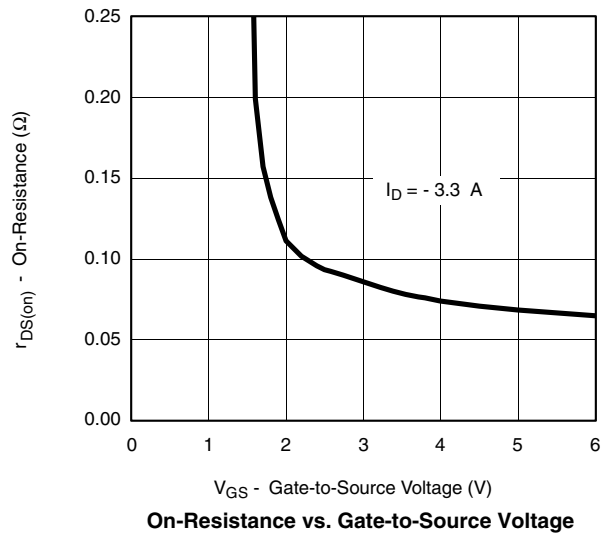
Notes:

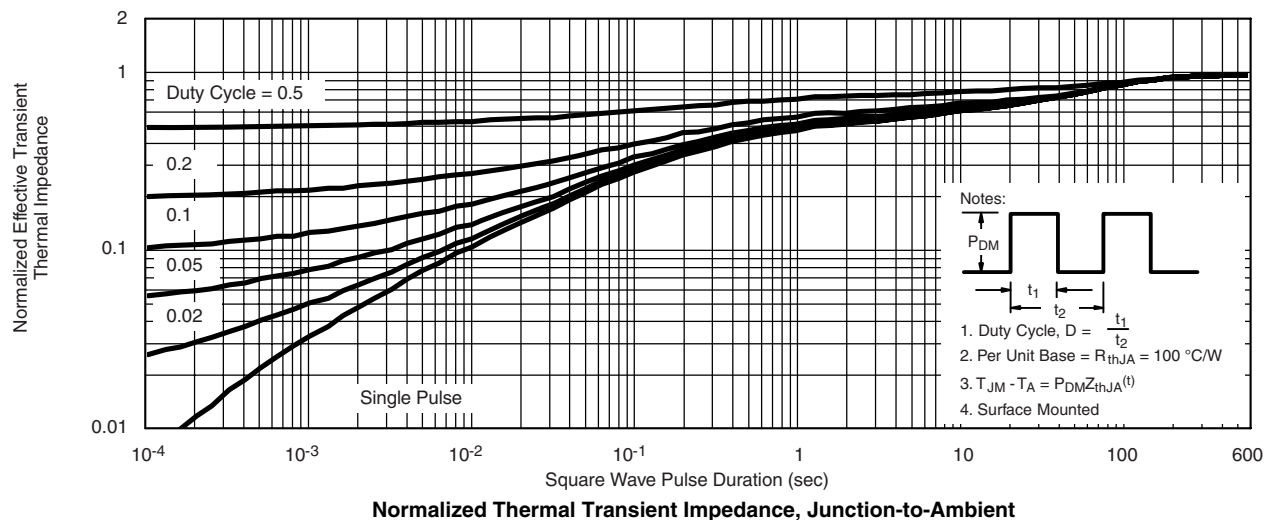
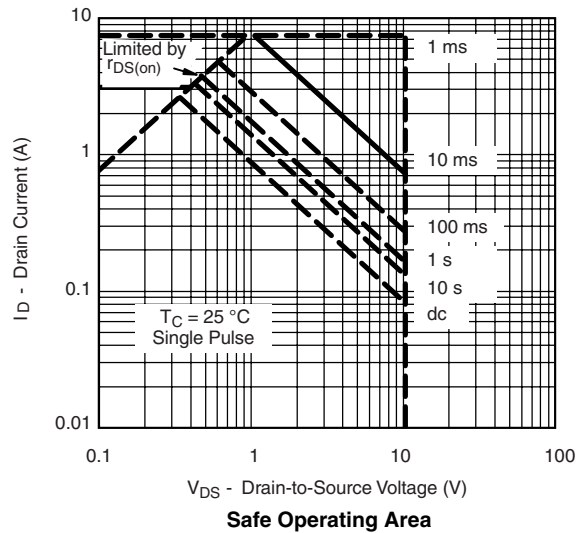
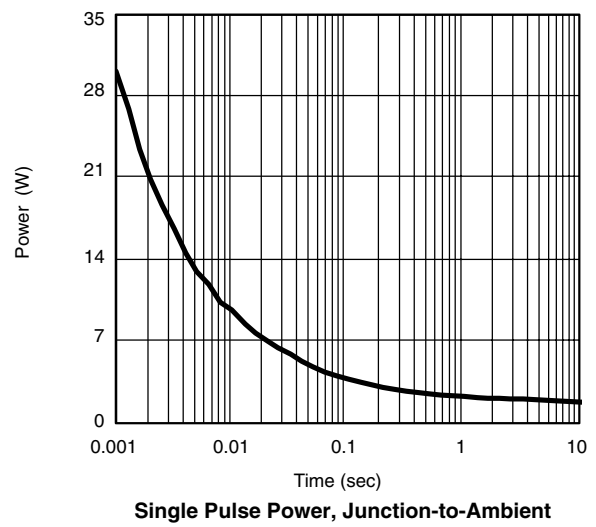
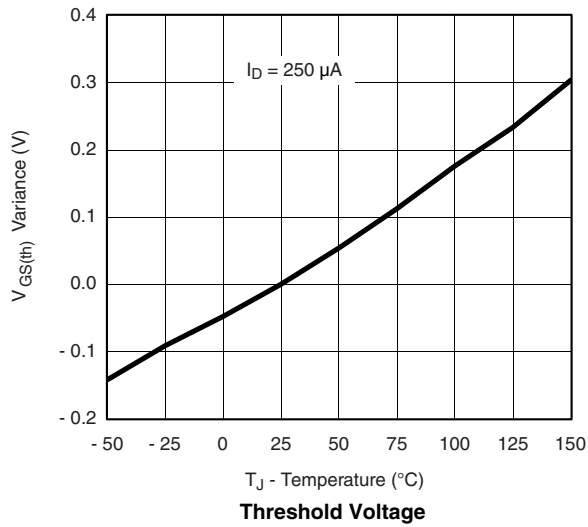
a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

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.

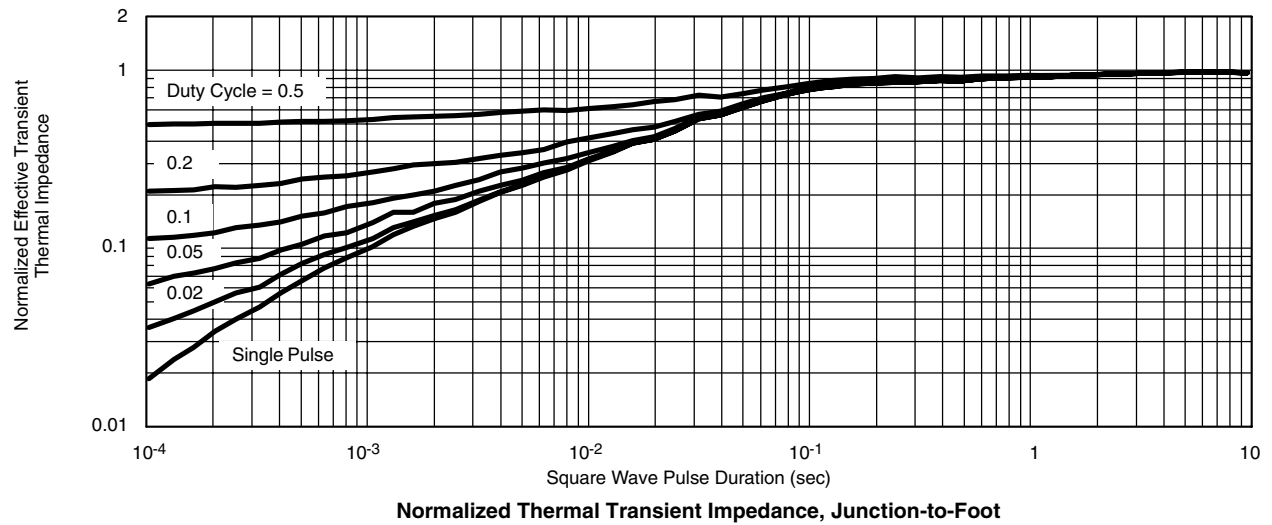
**TYPICAL CHARACTERISTICS**  $25\text{ }^{\circ}\text{C}$ , unless otherwise noted

**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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