

## P-Channel 30-V (D-S) MOSFET

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
- 30	0.053 at $V_{GS} = - 10$ V	- 4.0
	0.086 at $V_{GS} = - 4.5$ V	- 3.1

### FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFET

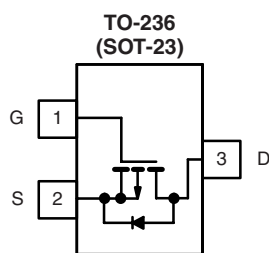


RoHS\*  
COMPLIANT

HALOGEN  
**FREE**  
Available

### APPLICATIONS

- Load Switch
- PA Switch



Top View  
Si2343DS (F3)\*  
\* Marking Code

Ordering Information: Si2343DS-T1  
Si2343DS-T1-E3 (Lead (Pb)-free)  
Si2343DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

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

Parameter	Symbol	5 s	Steady State	Unit
Drain-Source Voltage	$V_{DS}$	- 30		V
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150$ °C) <sup>a, b</sup>	$I_D$	- 4.0	- 3.1	A
		- 3.2	- 2.5	
Pulsed Drain Current	$I_{DM}$	- 15		
Continuous Source Current (Diode Conduction) <sup>a, b</sup>	$I_S$	- 1.0	- 0.6	W
Maximum Power Dissipation <sup>a, b</sup>	$P_D$	1.25	0.75	
		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 <sup>a</sup>	$R_{thJA}$	75	100	°C/W
		120	166	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	40	50	

Notes:

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

b. Pulse width limited by maximum junction temperature.

\* 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	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = -250\text{ }\mu\text{A}$	- 30			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\text{ }\mu\text{A}$	- 1		- 3	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24\text{ V}$ , $V_{GS} = 0\text{ V}$			- 1	$\mu\text{A}$
		$V_{DS} = -24\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 55\text{ }^{\circ}\text{C}$			- 10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}$ , $V_{GS} = -10\text{ V}$	- 15			A
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}$ , $I_D = -4.0\text{ A}$		0.043	0.053	$\Omega$
		$V_{GS} = -4.5\text{ V}$ , $I_D = -3.1\text{ A}$		0.068	0.086	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5\text{ V}$ , $I_D = -4.0\text{ A}$		10		S
Diode Forward Voltage	$V_{SD}$	$I_S = -1.0\text{ A}$ , $V_{GS} = 0\text{ V}$		- 0.7	- 1.2	V
Dynamic <sup>b</sup>						
Total Gate Charge	$Q_g$	$V_{DS} = -15\text{ V}$ , $V_{GS} = -10\text{ V}$ $I_D \cong -4.0\text{ A}$		14	21	nC
Gate-Source Charge	$Q_{gs}$			1.9		
Gate-Drain Charge	$Q_{gd}$			3.7		
Input Capacitance	$C_{iss}$	$V_{DS} = -15\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1\text{ MHz}$		540		pF
Output Capacitance	$C_{oss}$			131		
Reverse Transfer Capacitance	$C_{rss}$			105		
Switching <sup>c</sup>						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}$ , $R_L = 15\text{ }\Omega$ $I_D \cong -1.0\text{ A}$ , $V_{GEN} = -10\text{ V}$ $R_G = 6\text{ }\Omega$		10	15	ns
	$t_r$			15	25	
Turn-Off Time	$t_{d(off)}$			31	50	
	$t_f$			20	30	

Notes:

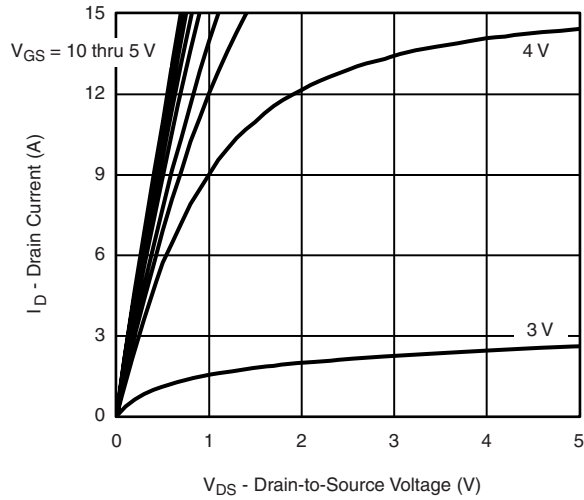
a. Pulse test:  $PW \leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

b. For DESIGN AID ONLY, not subject to production testing.

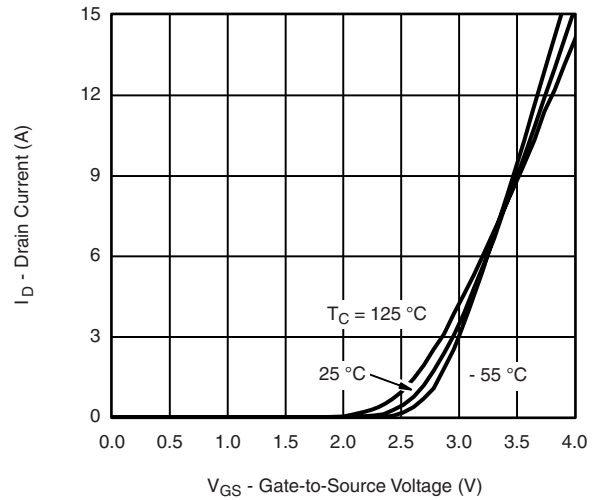
c. Switching time is essentially independent of operating temperature.

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.

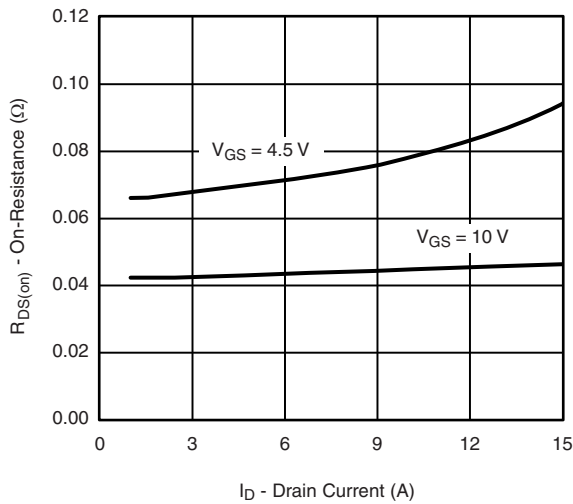
## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



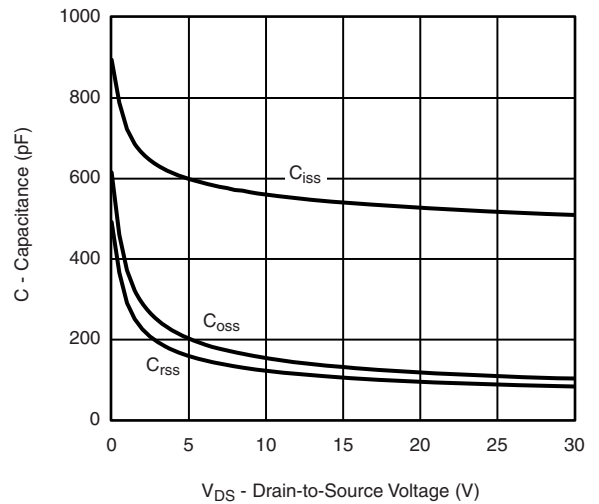
**Output Characteristics**



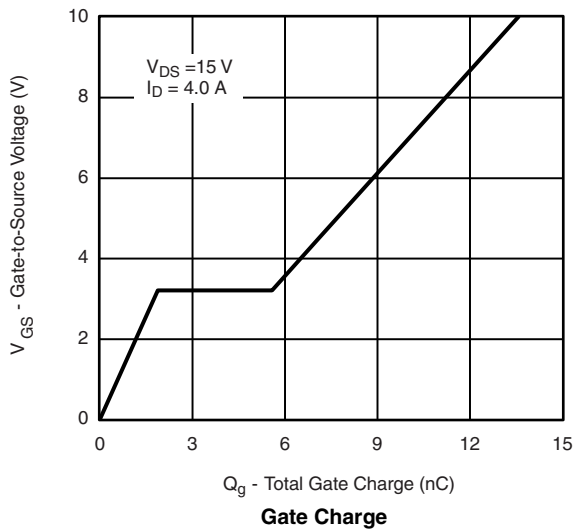
**Transfer Characteristics**



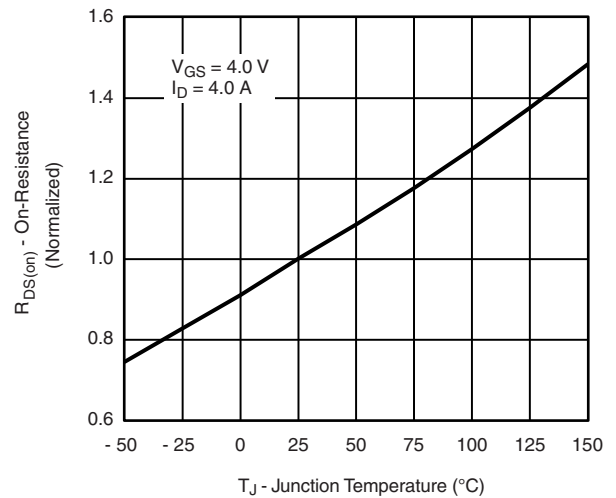
**On-Resistance vs. Drain Current**



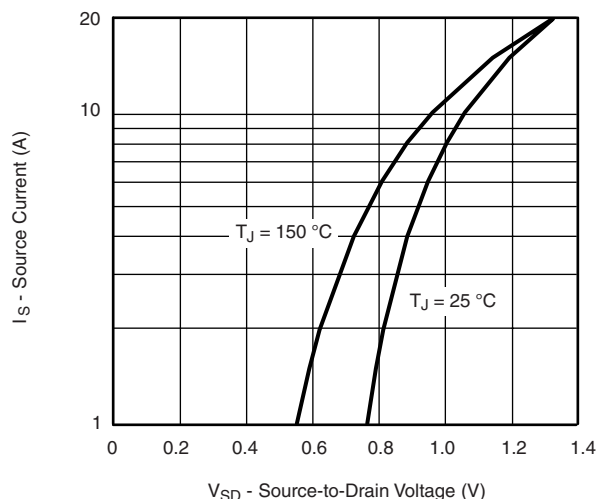
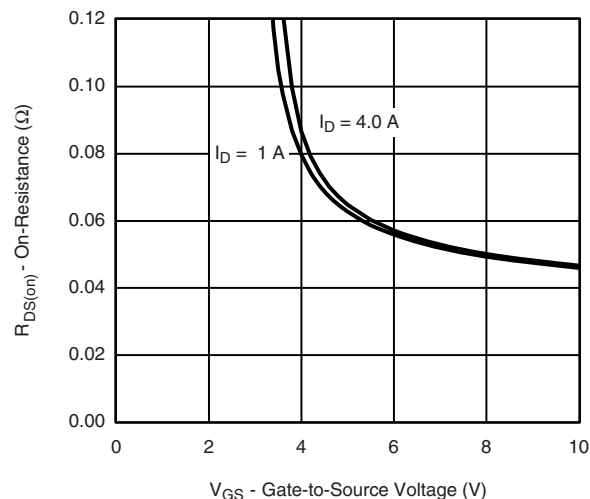
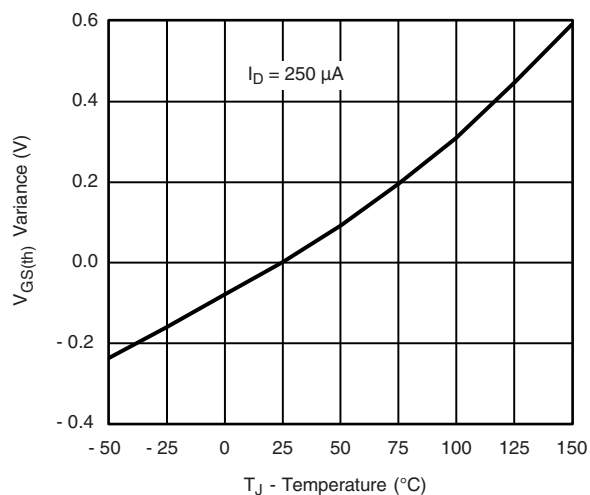
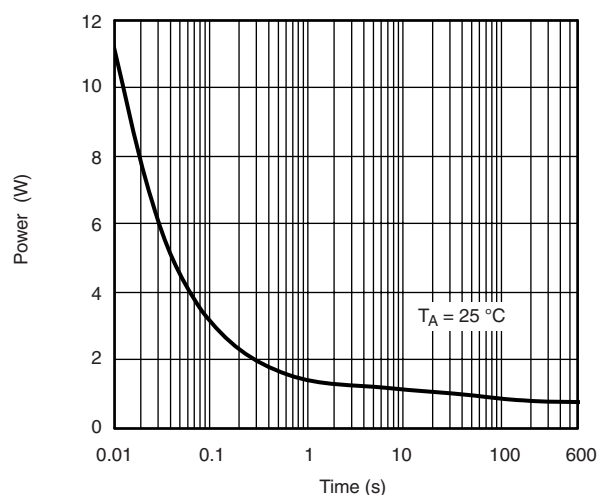
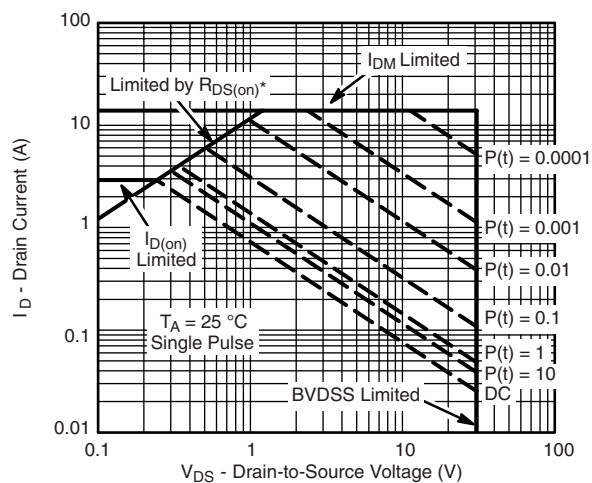
**Capacitance**



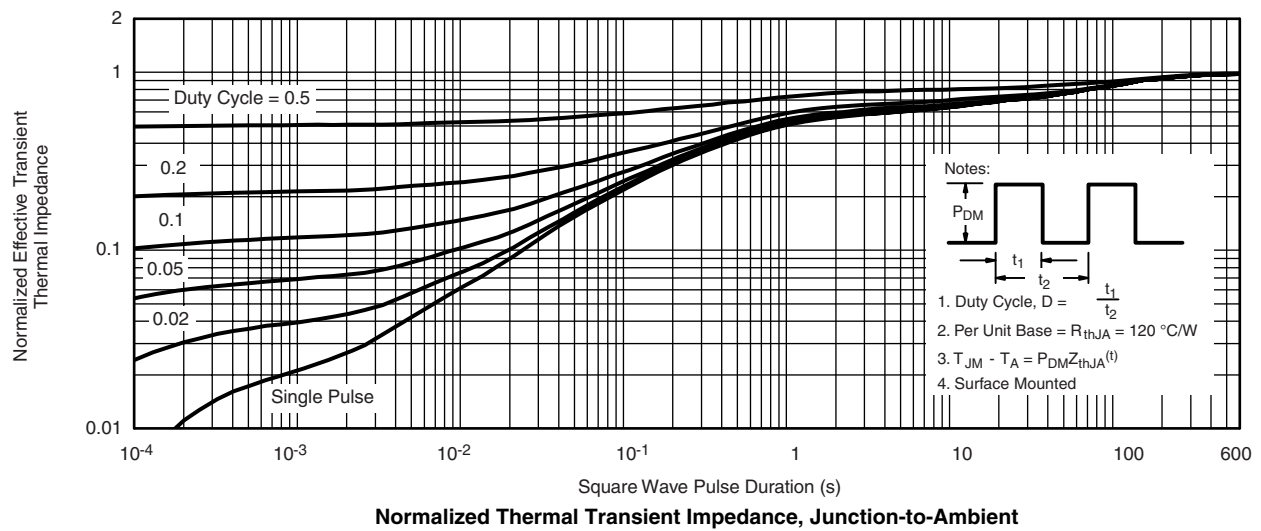
**Gate Charge**



**On-Resistance vs. Junction Temperature**

**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted**Source-Drain Diode Forward Voltage****On-Resistance vs. Gate-to-Source Voltage****Threshold Voltage****Single Pulse Power**\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified**Safe Operating Area**

## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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## SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A <sub>1</sub>	0.01	0.10	0.0004	0.004
A <sub>2</sub>	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E <sub>1</sub>	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e <sub>1</sub>	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L <sub>1</sub>	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°
ECN: S-03946-Rev. K, 09-Jul-01 DWG: 5479				

## RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads  
Dimensions in Inches/(mm)

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