

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

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>b</sup>
- 30	0.072 at $V_{GS} = - 10$ V	- 2.8
	0.120 at $V_{GS} = - 4.5$ V	- 2.0

### FEATURES

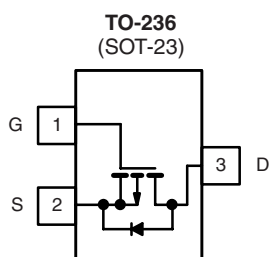
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETS
- Compliant to RoHS Directive 2002/95/EC



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
Available

### APPLICATIONS

- Load Switch
- PA Switch



Top View  
Si2341DS (F1)\*

\* Marking Code

Ordering Information: Si2341DS-T1-E3 (Lead (Pb)-free)  
Si2341DS-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 ( $T_J = 150\text{ }^{\circ}\text{C}$ ) <sup>b</sup>	$T_A = 25\text{ }^{\circ}\text{C}$	$I_D$	- 2.8	- 2.5	A
	$T_A = 70\text{ }^{\circ}\text{C}$		- 2.2	- 2.0	
Pulsed Drain Current <sup>a</sup>		$I_{DM}$	- 12		
Continuous Source Current (Diode Conduction) <sup>b</sup>		$I_S$	- 0.75	- 0.6	W
Power Dissipation <sup>b</sup>	$T_A = 25\text{ }^{\circ}\text{C}$	$P_D$	0.9	0.71	
	$T_A = 70\text{ }^{\circ}\text{C}$		0.57	0.45	
Operating Junction and Storage Temperature Range		$T_J, T_{sta}$	- 55 to 150		$^{\circ}\text{C}$

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	115	140	°C/W
Maximum Junction-to-Ambient <sup>c</sup>		140	175	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	60	75	

Notes:

- Pulse width limited by maximum junction temperature.
- Surface mounted on FR4 board,  $t \leq 5$  s.
- Surface mounted on FR4 board.

MOSFET 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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = -10\text{ }\mu\text{A}$	- 30			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\text{ }\mu\text{A}$	- 1.0		- 3.0	
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>	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}$ , $V_{GS} = -10\text{ V}$	- 6			A
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}$ , $I_D = -2.8\text{ A}$		0.057	0.072	$\Omega$
		$V_{GS} = -4.5\text{ V}$ , $I_D = -2.0\text{ A}$		0.090	0.120	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5\text{ V}$ , $I_D = -2.8\text{ A}$		8.0		S
Diode Forward Voltage	$V_{SD}$	$I_S = -0.75\text{ A}$ , $V_{GS} = 0\text{ V}$		- 0.8	- 1.2	V
Dynamic <sup>b</sup>						
Total Gate Charge	$Q_g$	$V_{DS} = -15\text{ V}$ , $V_{GS} = -10\text{ V}$ $I_D \cong -2.8\text{ A}$		9.5	15	nC
Gate-Source Charge	$Q_{gs}$			1.5		
Gate-Drain Charge	$Q_{gd}$			2.5		
Input Capacitance	$C_{iss}$	$V_{DS} = -15\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1\text{ MHz}$		400		pF
Output Capacitance	$C_{oss}$			95		
Reverse Transfer Capacitance	$C_{rss}$			70		
Switching <sup>c</sup>						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}$ , $R_L = 15\text{ }\Omega$ $I_D \cong -1.0\text{ A}$ , $V_{GEN} = -4.5\text{ V}$ $R_g = 6\text{ }\Omega$		7	15	ns
	$t_r$			15	25	
Turn-Off Time	$t_{d(off)}$			20	30	
	$t_f$			20	30	

Notes:

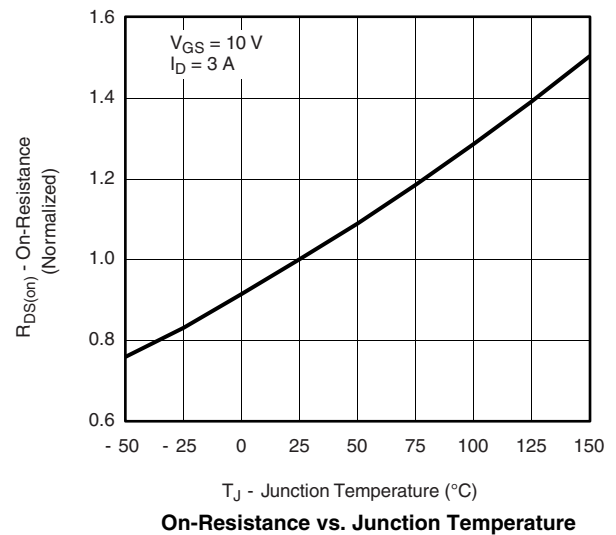
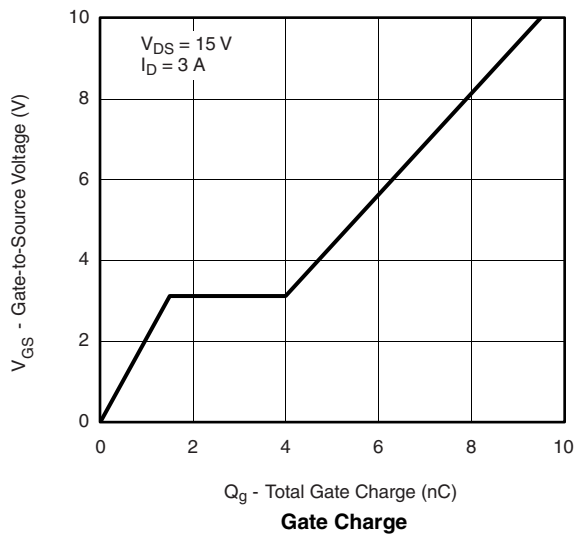
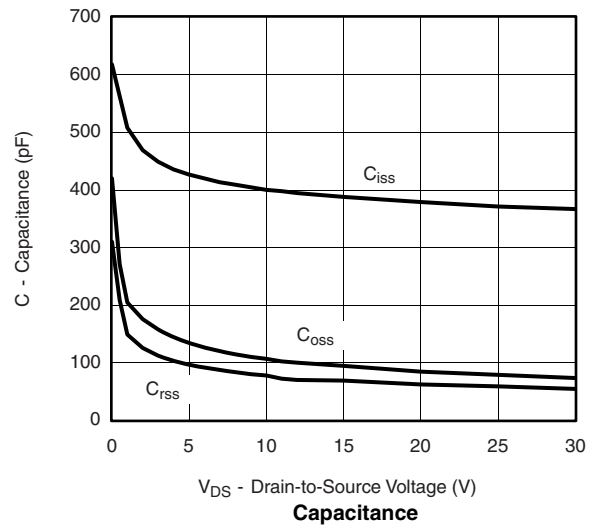
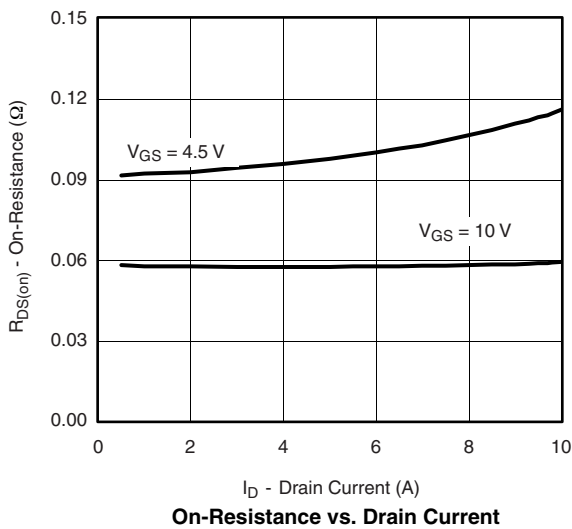
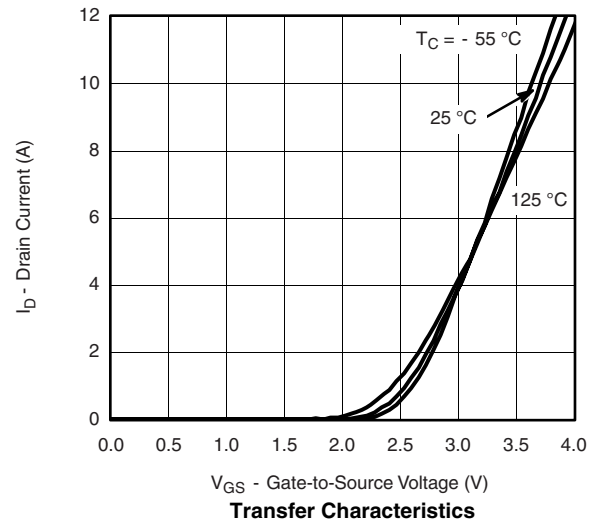
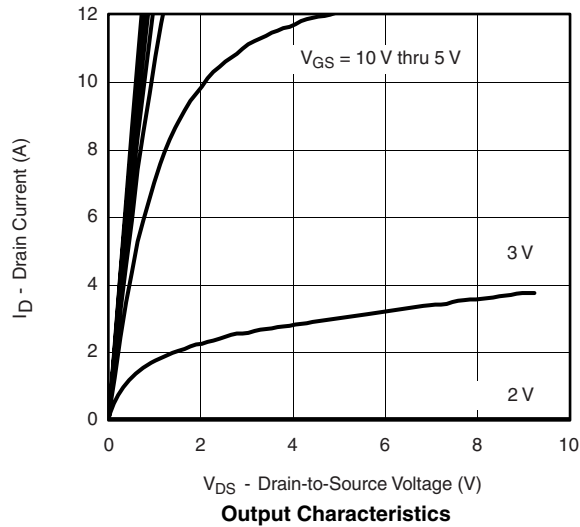
a. Pulse test:  $PW \leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

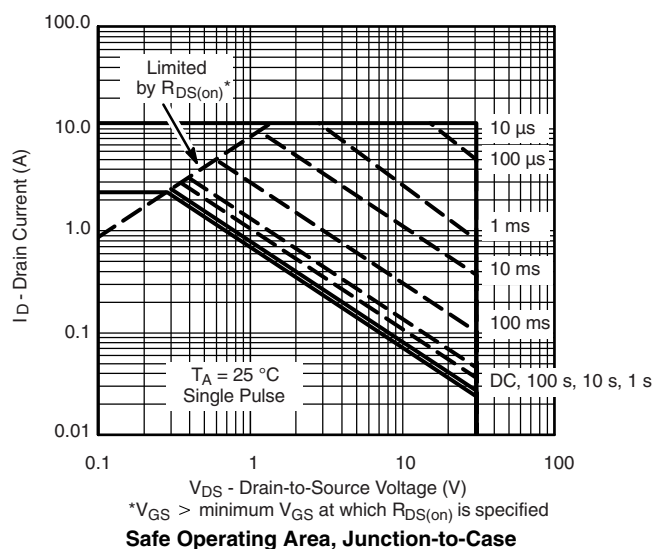
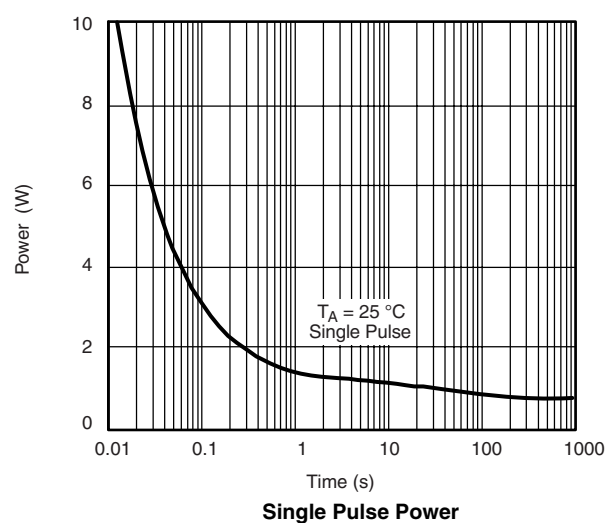
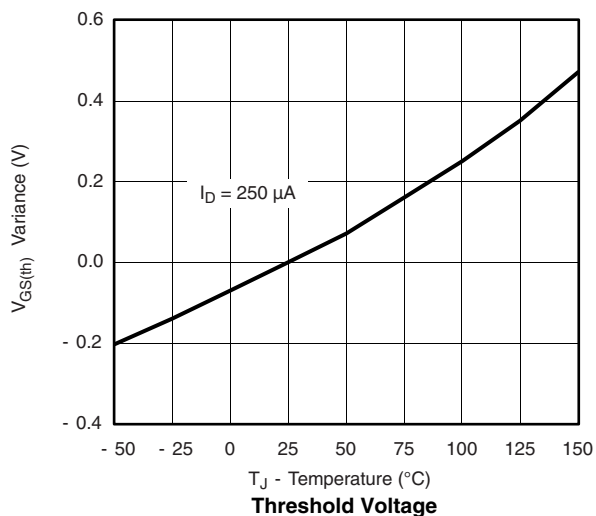
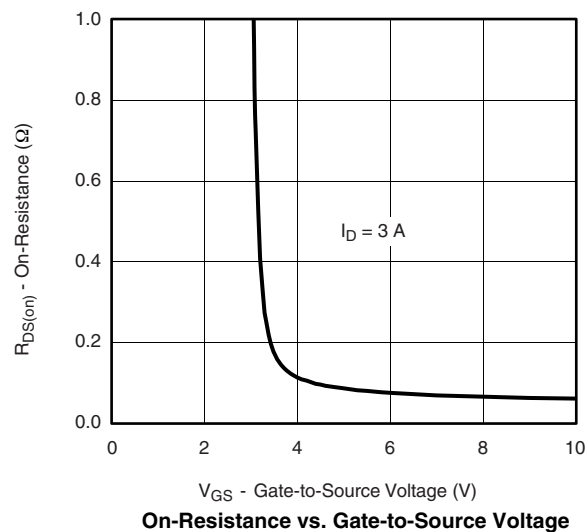
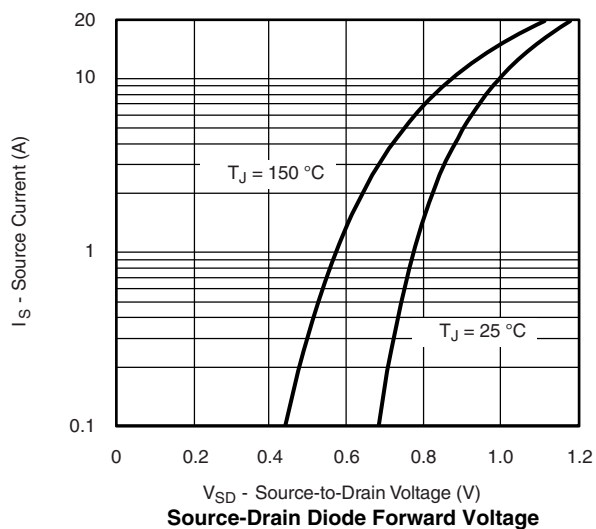
b. For DESIGN AID ONLY, not subject to production testing.

c. Switching time is essentially independent of operating temperature.

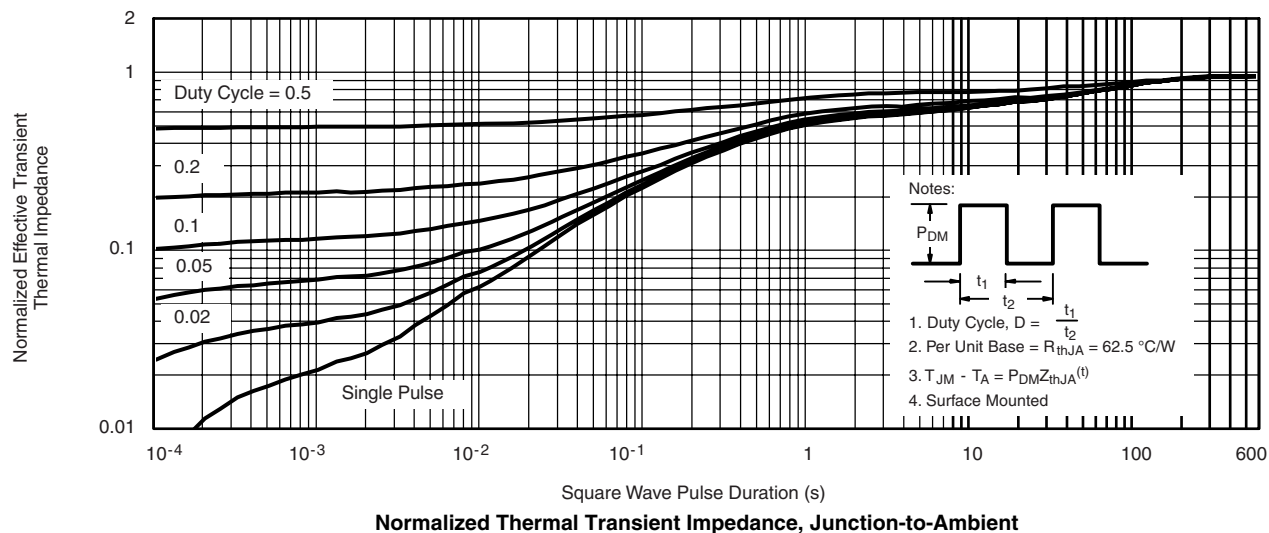
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

## TYPICAL CHARACTERISTICS 25 °C unless noted



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