

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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^b
- 30	0.072 at $V_{GS} = - 10$ V	- 2.8
	0.120 at $V_{GS} = - 4.5$ V	- 2.0

FEATURES

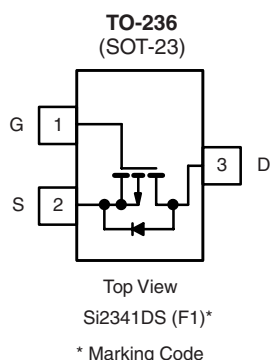
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFETS
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

- Load Switch
- PA Switch



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 ($T_J = 150\text{ }^{\circ}\text{C}$) ^b	$T_A = 25\text{ }^{\circ}\text{C}$	I_D	- 2.8	- 2.5	A
	$T_A = 70\text{ }^{\circ}\text{C}$		- 2.2	- 2.0	
Pulsed Drain Current ^a		I_{DM}	- 12		
Continuous Source Current (Diode Conduction) ^b		I_S	- 0.75	- 0.6	W
Power Dissipation ^b	$T_A = 25\text{ }^{\circ}\text{C}$	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 ^b	R_{thJA}	115	140	°C/W
Maximum Junction-to-Ambient ^c		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}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24\text{ V}$, $V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -24\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}$, $V_{GS} = -10\text{ V}$	-6			A
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}$, $I_D = -2.8\text{ A}$		0.057	0.072	Ω
		$V_{GS} = -4.5\text{ V}$, $I_D = -2.0\text{ A}$		0.090	0.120	
Forward Transconductance ^a	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 ^b						
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 ^c						
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:

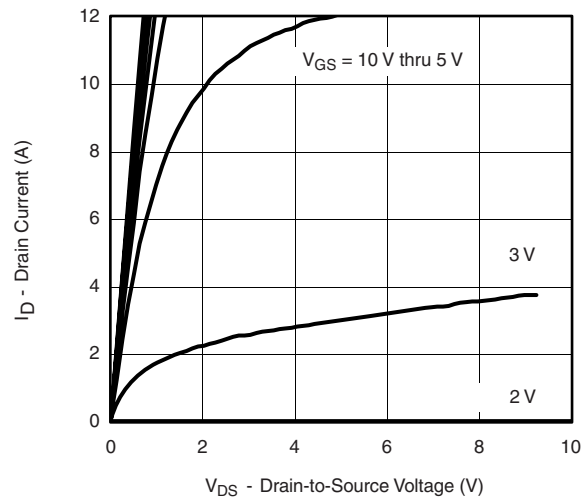
a. Pulse test: $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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

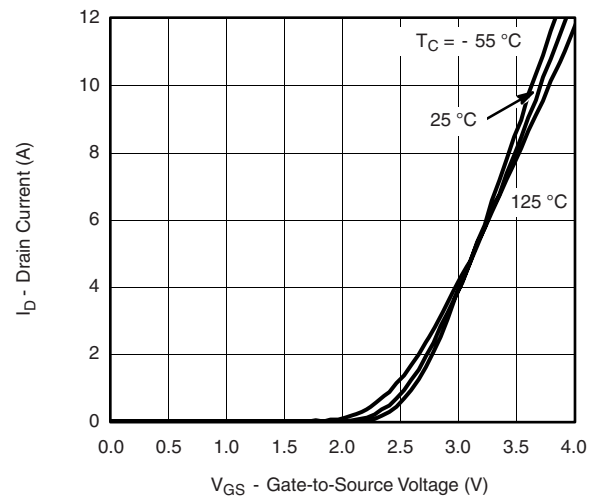
c. Switching time is essentially independent of operating temperature.

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.

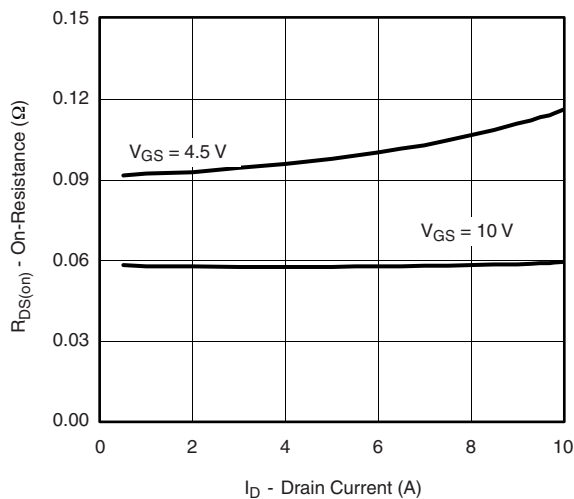
TYPICAL CHARACTERISTICS 25 °C unless noted



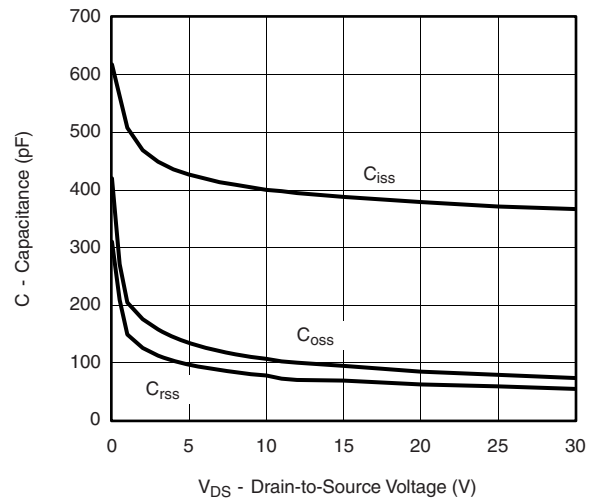
Output Characteristics



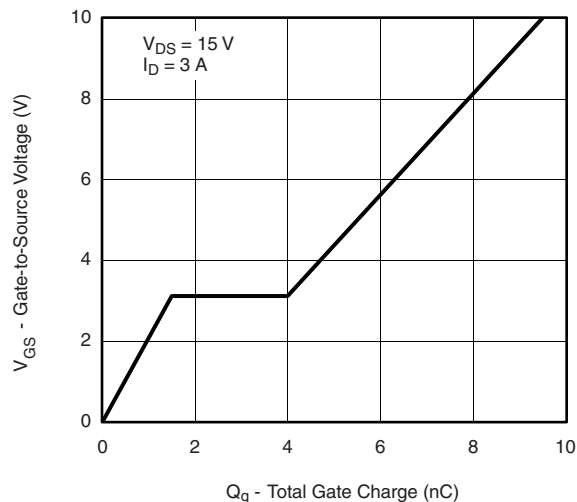
Transfer Characteristics



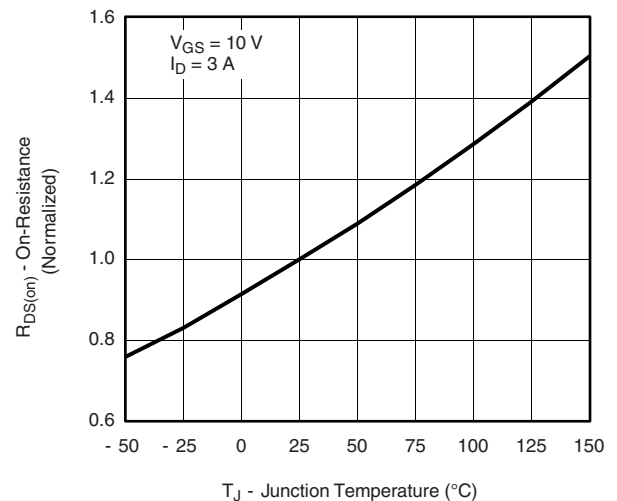
On-Resistance vs. Drain Current



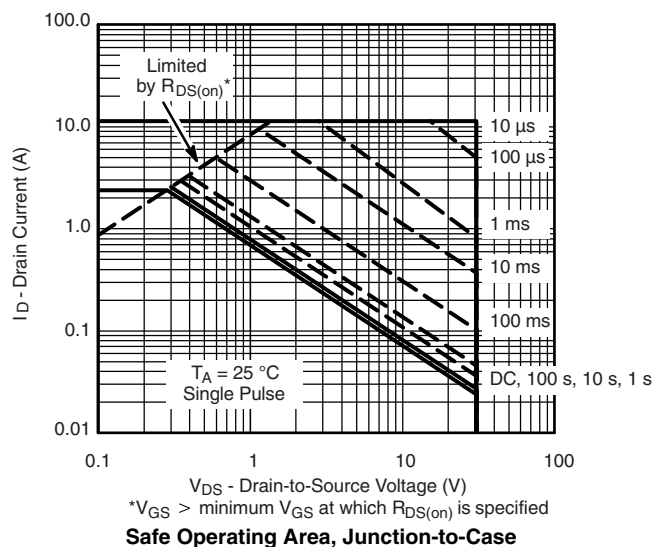
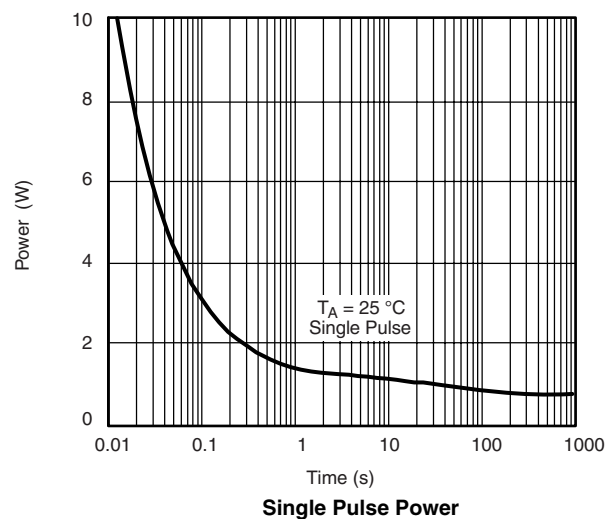
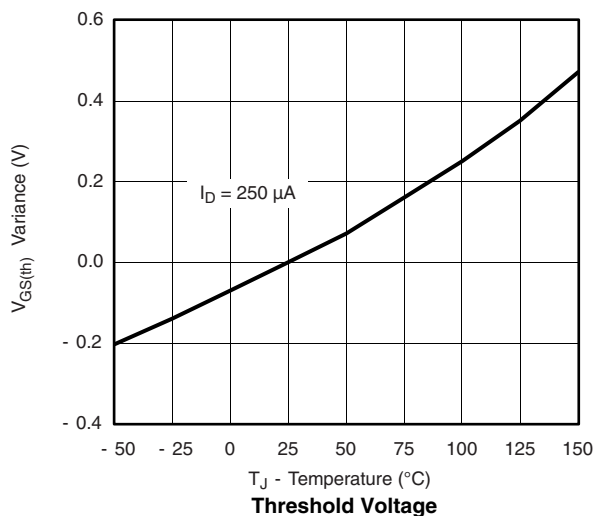
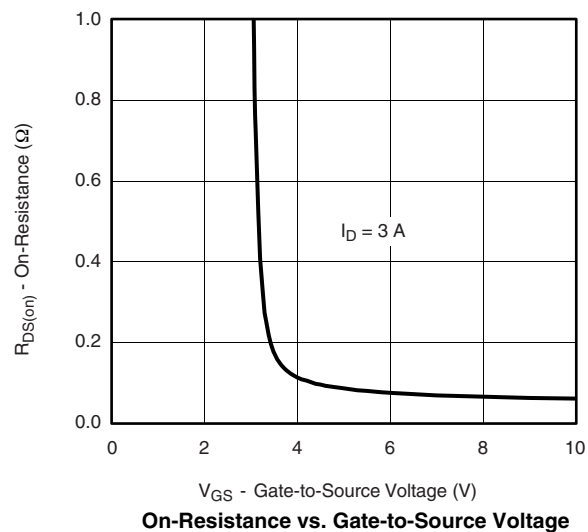
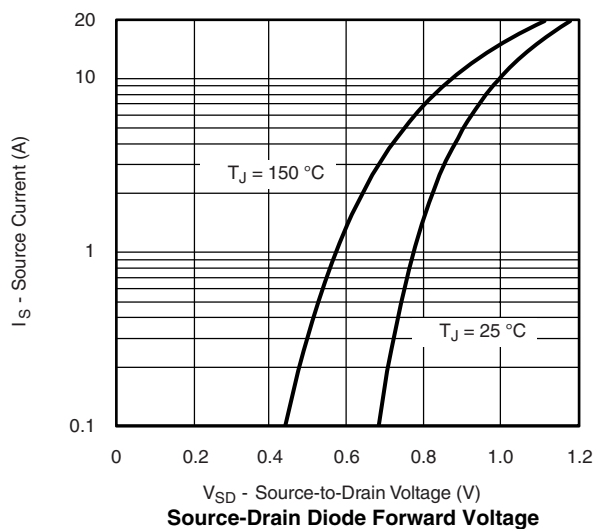
Capacitance



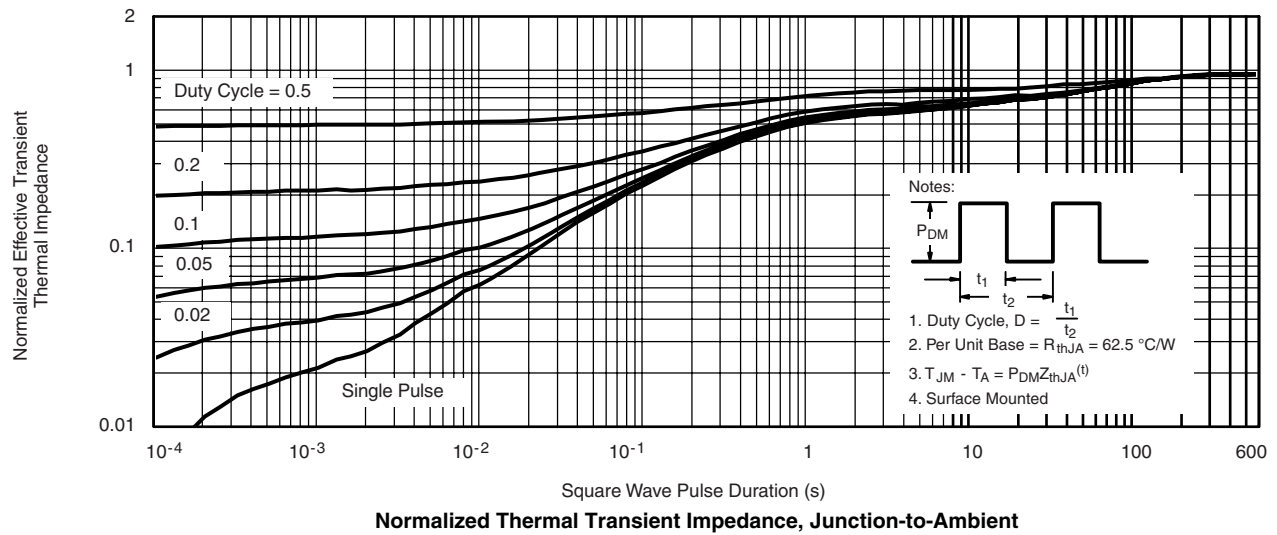
Gate Charge



On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C unless noted

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