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

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[b]
- 30	0.200 at V_{GS} = - 10 V	- 1.64
	0.380 at V_{GS} = - 4.5 V	- 1.0

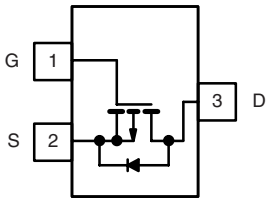
FEATURES

- **Halogen-free Option Available**

Pb-free Available

RoHS* COMPLIANT

TO-236
(SOT-23)



Top View

Si2303BDS (L3)*

* Marking Code

Ordering Information: Si2303BDS-T1
Si2303BDS-T1-E3 (Lead (Pb)-free)
Si2303BDS-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}	± 20		
Continuous Drain Current (T_J = 150 °C)[b]	T_A = 25 °C	I_D	- 1.64	- 1.49	A
	T_A = 70 °C		- 1.31	- 1.2	
Pulsed Drain Current[a]		I_{DM}	- 10		
Continuous Source Current (Diode Conduction)[b]		I_S	- 0.75	- 0.6	
Power Dissipation[b]	T_A = 25 °C	P_D	0.9	0.7	W
	T_A = 70 °C		0.57	0.45	
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[b]	R_{thJA}	120	145	°C/W
Maximum Junction-to-Ambient[c]		140	175	

Notes:
a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 board, t ≤ 5 s.
c. Surface Mounted on FR4 board.

For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm

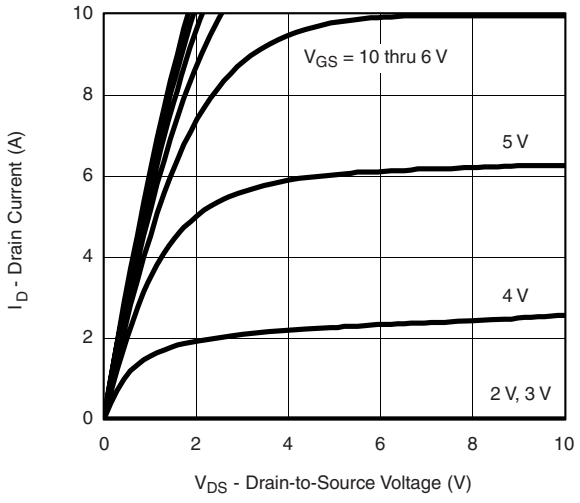
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = - 10 µA	- 30			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.0		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 10 V	- 6			A
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 1.7 A		0.150	0.200	Ω
		V_{GS} = - 4.5 V, I_D = - 1.3 A		0.285	0.380	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 1.7 A		2.0		S
Diode Forward Voltage	V_{SD}	I_S = - 0.75 A, V_{GS} = 0 V		- 0.85	- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, $I_D \cong$ - 1.7 A		4.3	10	nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			1.3		
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		180		pF
Output Capacitance	C_{oss}			50		
Reverse Transfer Capacitance	C_{rss}			35		
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 15 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 4.5 V R_G = 6 Ω		55	80	ns
	t_r			40	60	
Turn-Off Time	$t_{d(off)}$			10	20	
	t_f			10	20	

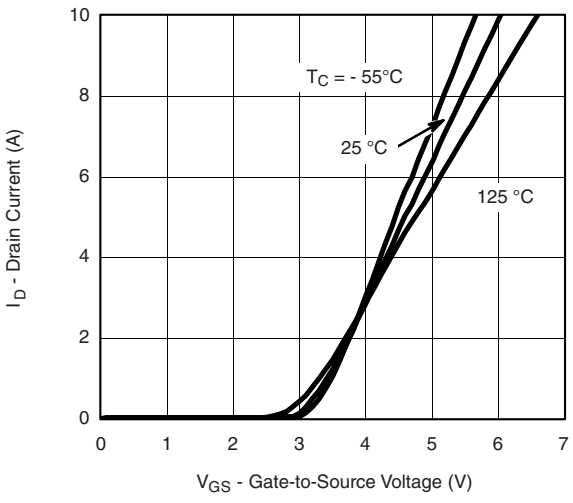
Notes:
a. Pulse test: PW ≤ 300 µs, duty cycle ≤ 2 %.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

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.

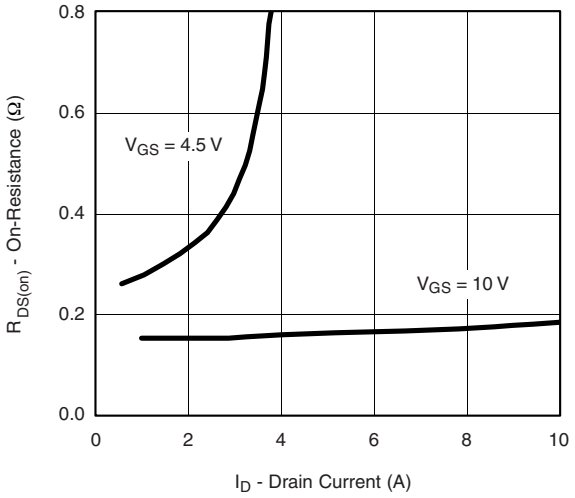
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



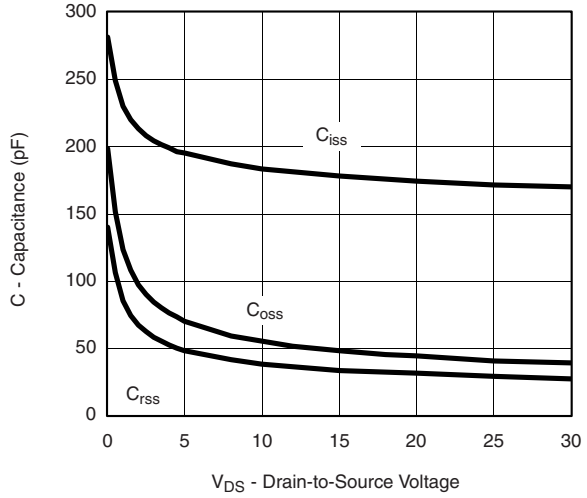
Output Characteristics



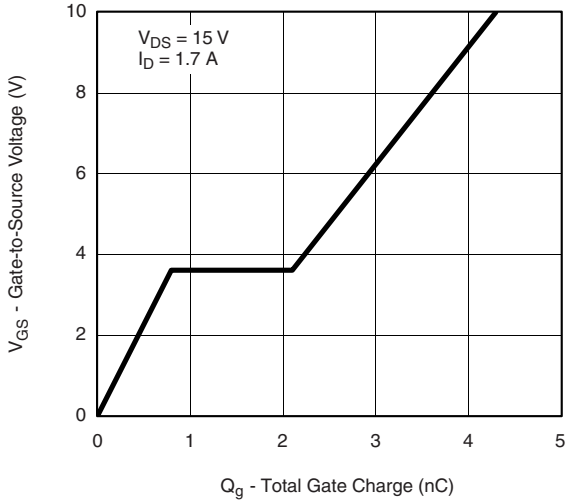
Transfer Characteristics



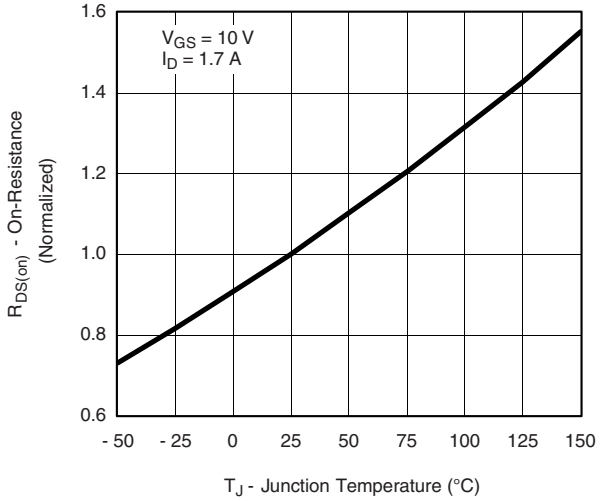
On-Resistance vs. Drain Current



Capacitance

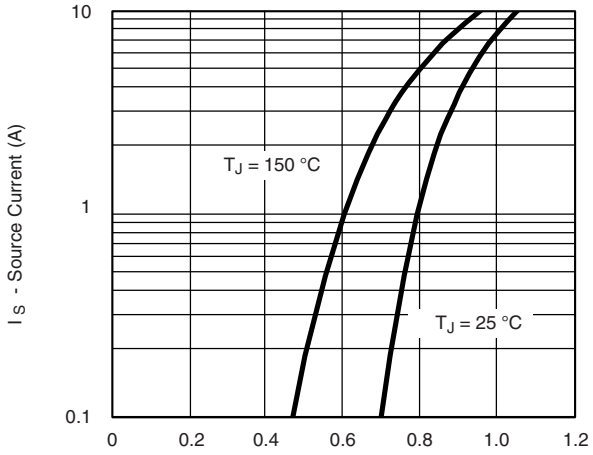


Gate Charge

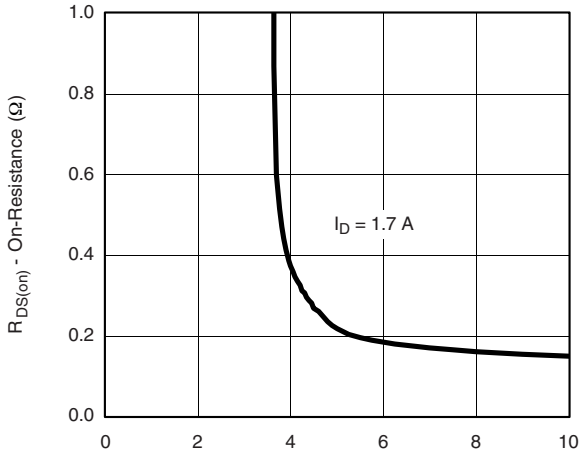


On-Resistance vs. Junction Temperature

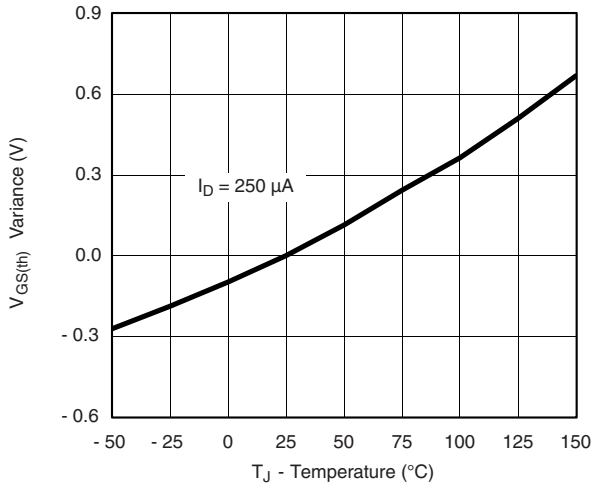
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



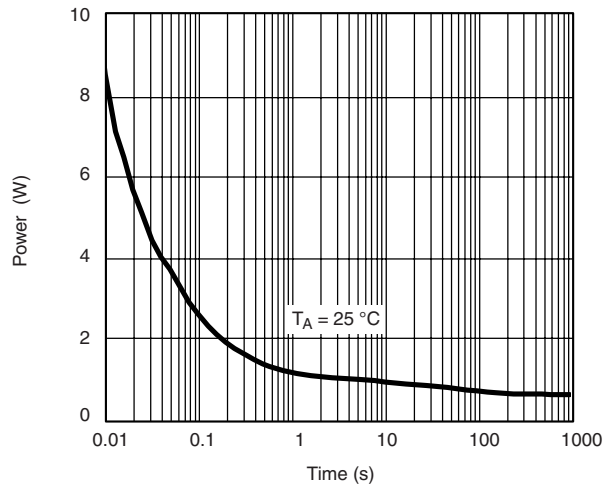
Source-Drain Diode Forward Voltage



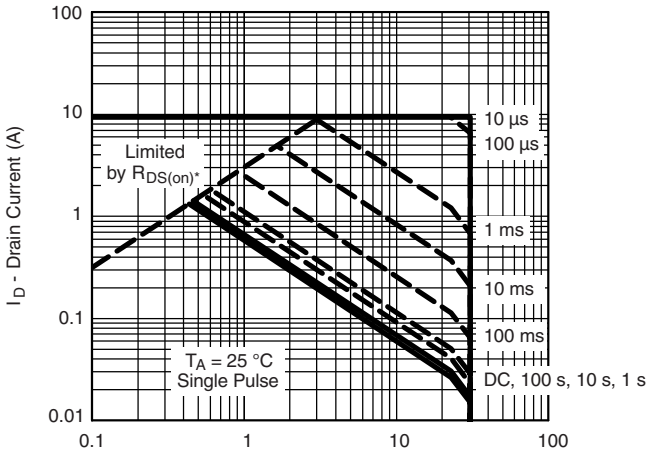
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

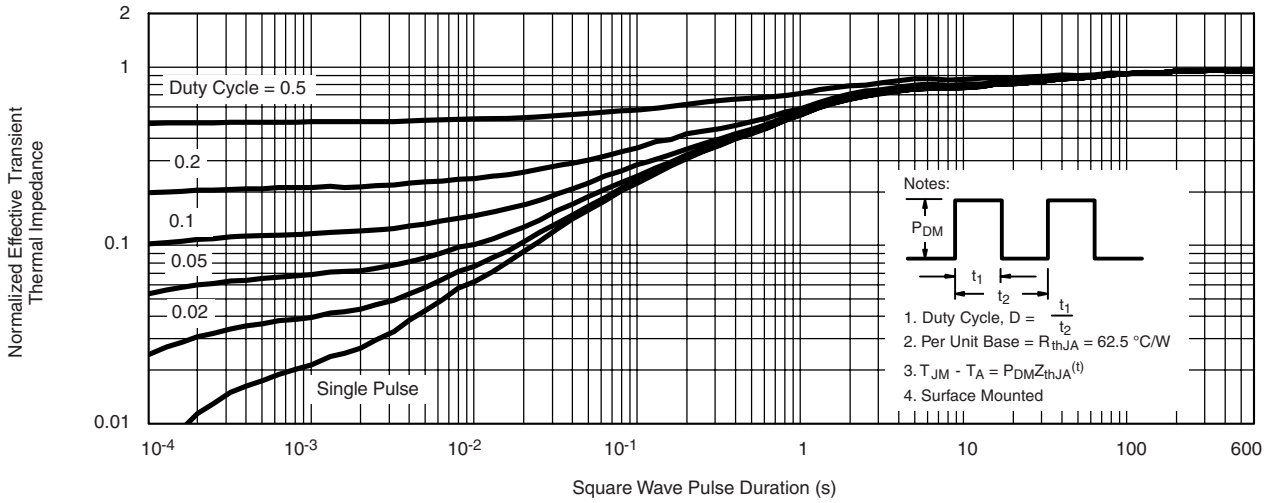


Single Pulse Power



Safe Operating Area, Junction-to-Case

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient

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