

N-Channel 1.5-V (G-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (mA)
20	5 at $V_{GS} = 4.5$ V	200
	7 at $V_{GS} = 2.5$ V	175
	9 at $V_{GS} = 1.8$ V	150
	10 at $V_{GS} = 1.5$ V	50

FEATURES

- Low-Side Switching
- Low On-Resistance: 5 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 35 ns
- 1.8 V Operation
- Gate-Source ESD Protection
- TrenchFET® Power MOSFETs
- 2000 V ESD Protection



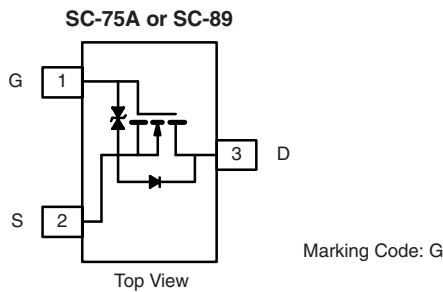
Available
RoHS*
COMPLIANT

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers



Ordering Information:

SC-75A (SOT-416): Si1032R-T1
 SC-75A (SOT-416): Si1032R-T1-E3 (Lead (Pb)-free)
 SC-89 (SOT-490): Si1032X-T1
 SC-89 (SOT-490): Si1032X-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted							
Parameter	Symbol	Si1032R		Si1032X		Unit	
		5 s	Steady State	5 s	Steady State		
Drain-Source Voltage	V_{DS}	20				V	
Gate-Source Voltage	V_{GS}	± 6					
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	200	140	210	200	mA
		$T_A = 85$ °C	110	100	150	140	
Pulsed Drain Current ^a	I_{DM}	500		600			
Continuous Source Current (diode conduction) ^a	I_S	250	200	300	240	mW	
Maximum Power Dissipation ^a for SC-75	P_D	$T_A = 25$ °C	280	250	340		300
		$T_A = 85$ °C	145	130	170	150	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150				°C	
Gate-Source ESD Rating (HBM, Method 3015)	ESD	2000				V	

Notes:

a. Surface Mounted on FR4 Board.

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

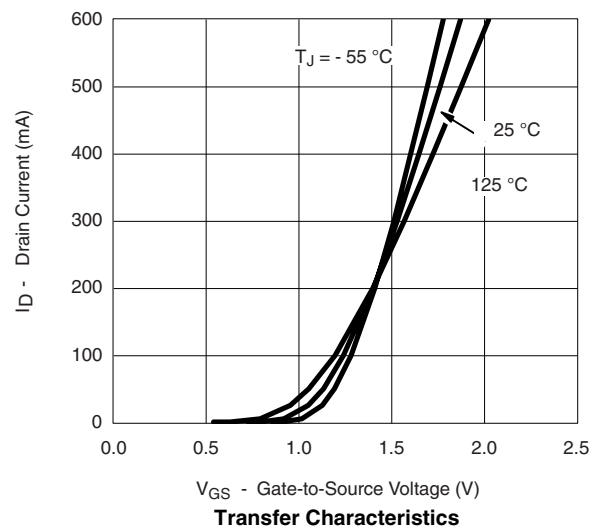
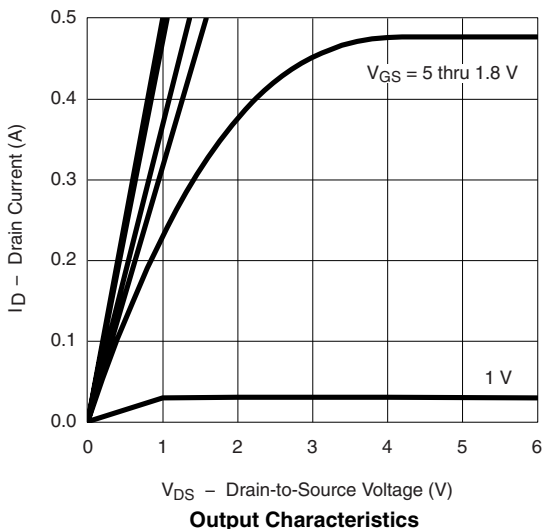
SPECIFICATIONS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.40	0.7	1.2	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 2.8\text{ V}$		± 0.5	± 1.0	μA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 4.5\text{ V}$		± 1.0	± 3.0	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$			1	
		$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 4.5\text{ V}$	250			mA
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 200\text{ mA}$			5	Ω
		$V_{GS} = 2.5\text{ V}, I_D = 175\text{ mA}$			7	
		$V_{GS} = 1.8\text{ V}, I_D = 150\text{ mA}$			9	
		$V_{GS} = 1.5\text{ V}, I_D = 40\text{ mA}$			10	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 200\text{ mA}$		0.5		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 150\text{ mA}, V_{GS} = 0\text{ V}$			1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 250\text{ mA}$		750		μC
Gate-Source Charge	Q_{gs}			75		
Gate-Drain Charge	Q_{gd}			225		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 47\text{ }\Omega$ $I_D \cong 200\text{ mA}, V_{GEN} = 4.5\text{ V}, R_G = 10\text{ }\Omega$			50	ns
Rise Time	t_r				25	
Turn-Off Delay Time	$t_{d(off)}$				50	
Fall Time	t_f				25	

Notes:

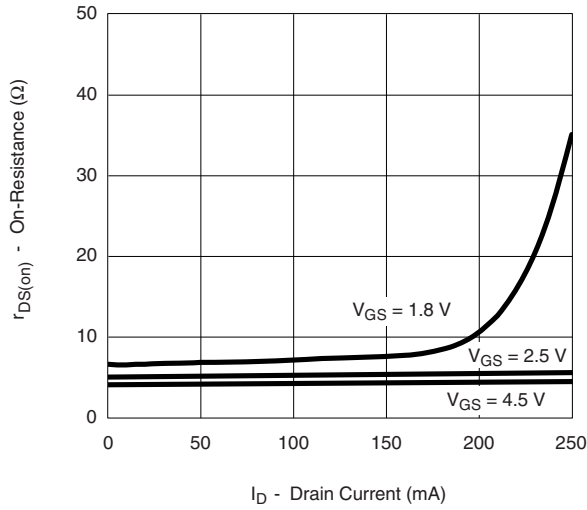
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

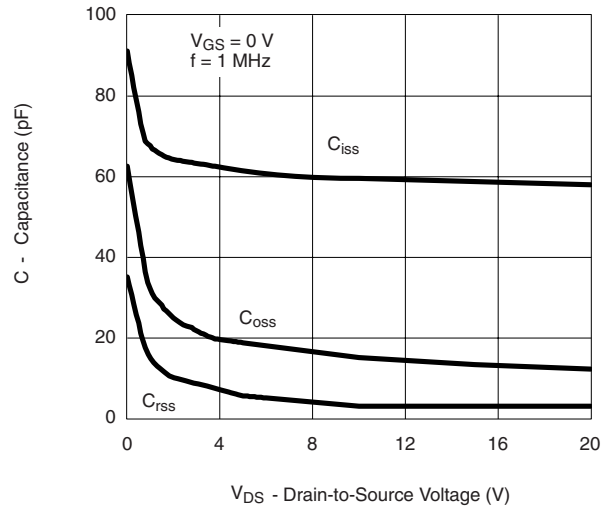
TYPICAL CHARACTERISTICS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted



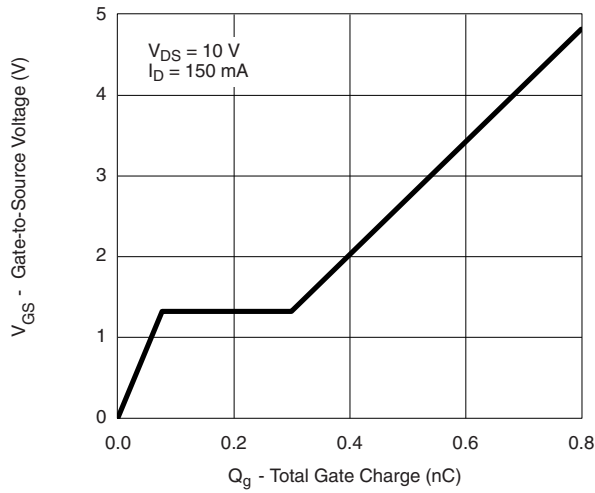
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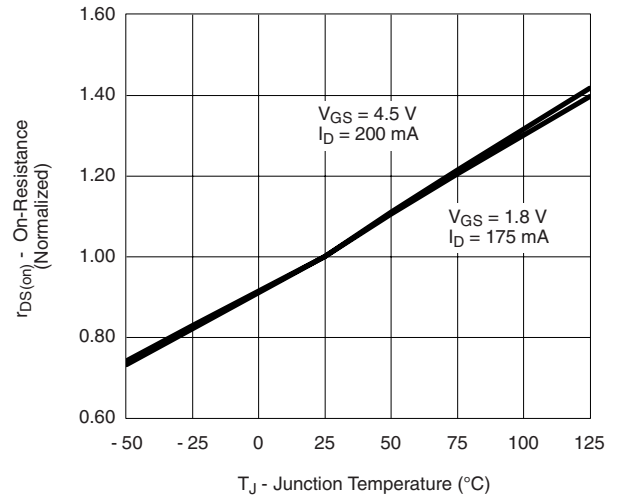
On-Resistance vs. Drain Current



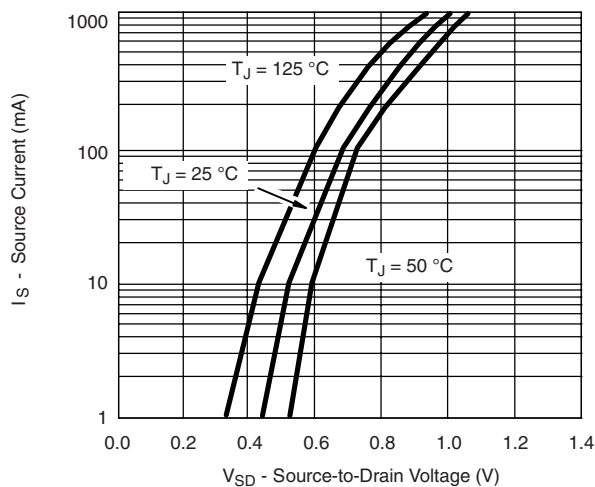
Capacitance



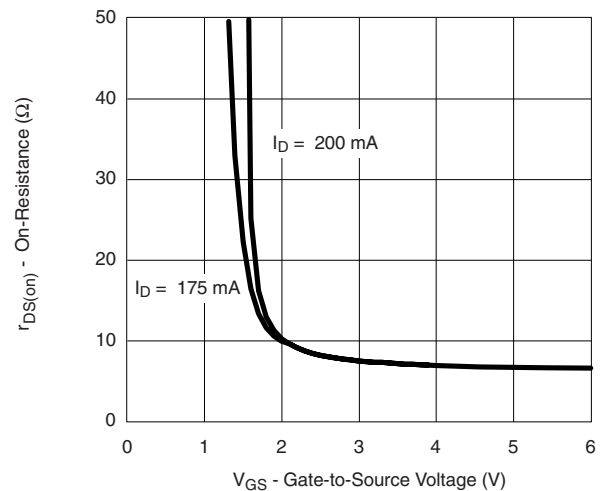
Gate Charge



On-Resistance vs. Junction Temperature

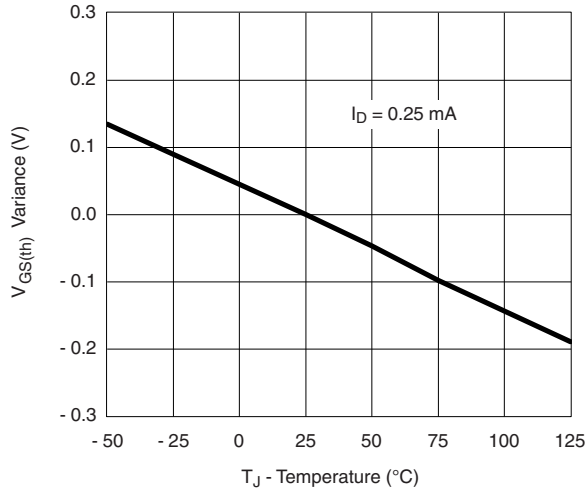


Surge-Drain Diode Forward Voltage

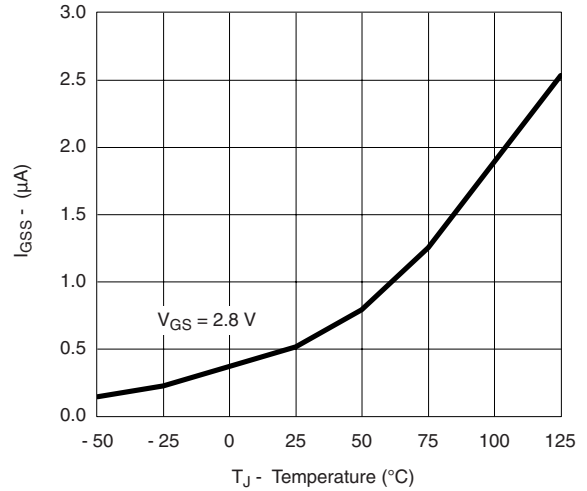


On-Resistance vs. Gate-to-Source Voltage

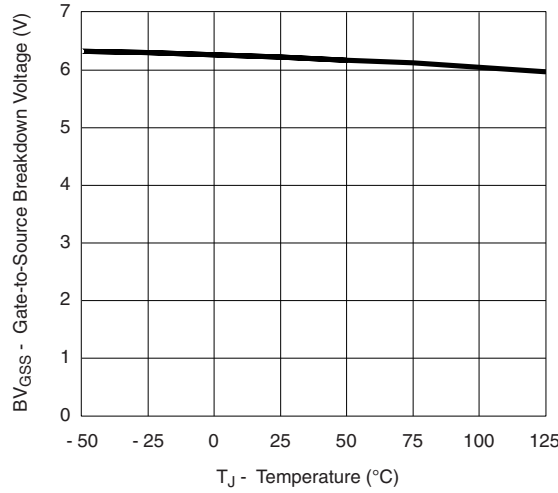
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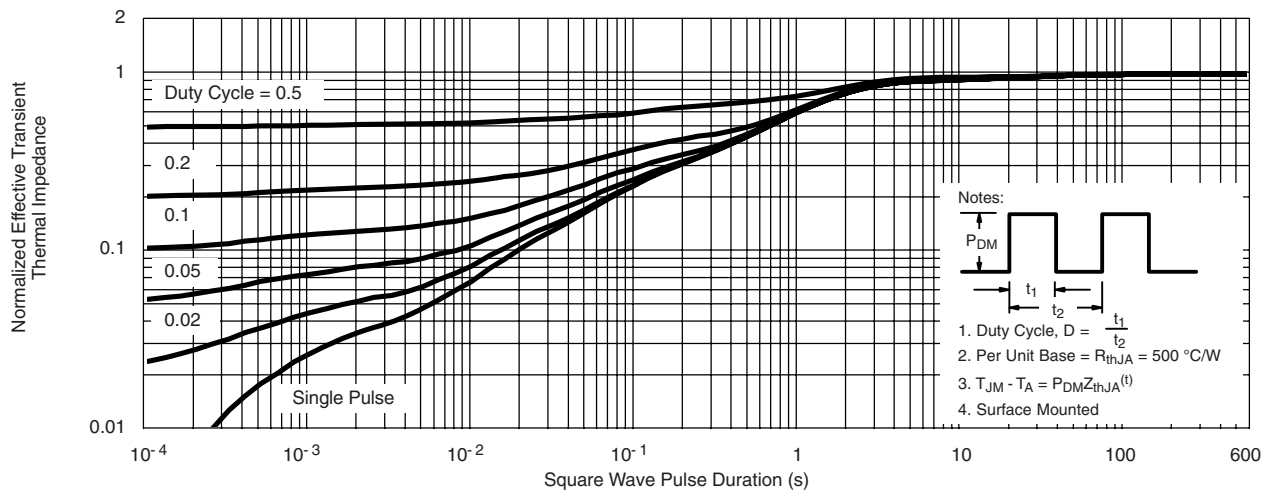
Threshold Voltage Variance vs. Temperature



I_{GSS} vs. Temperature



BV_{GSS} vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient (SC-75A, Si1032R Only)

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