

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

- Halogen-free Option Available
- Low-Side Switching
- Low On-Resistance: 5 Ω
- Low Threshold: 0.9 V (typ.)
- Fast Switching Speed: 35 ns
- TrenchFET® Power MOSFETs: 1.5-V Rated
- 2000 V ESD Protection



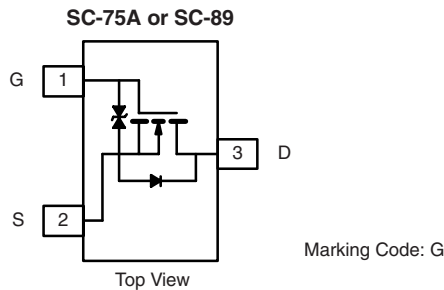
RoHS
COMPLIANT

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:

Si1032R-T1-E3 (SC-75A, Lead (Pb)-free)
 Si1032R-T1-GE3 (SC-75A, Lead (Pb)-free and Halogen-free)
 Si1032X-T1-E3 (SC-89, Lead (Pb)-free)
 Si1032X-T1-GE3 (SC-89, Lead (Pb)-free and Halogen-free)

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

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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	T _A = 25 °C	I _D	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	
Maximum Power Dissipation ^a for SC-75	T _A = 25 °C	P _D	280	250	340	300	mW
	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.

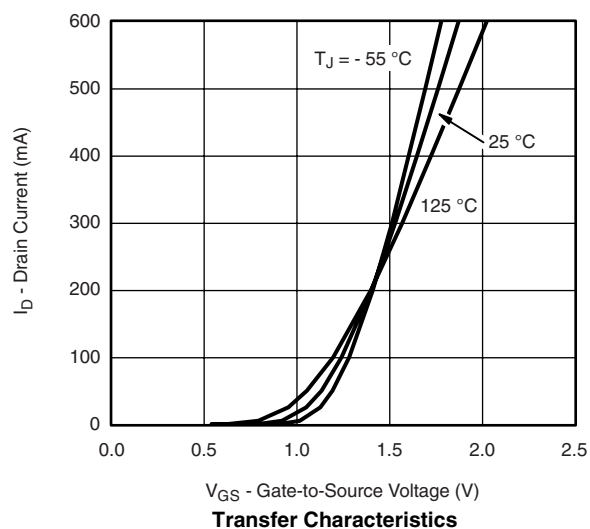
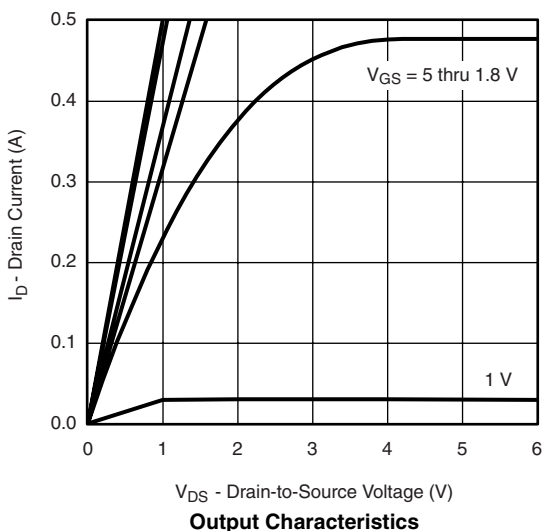
SPECIFICATIONS $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.40	0.7	1.2	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 2.8\text{ V}$		± 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		pC
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:

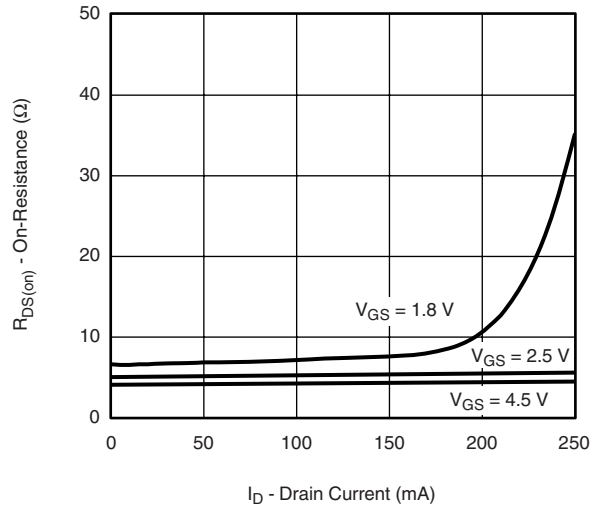
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

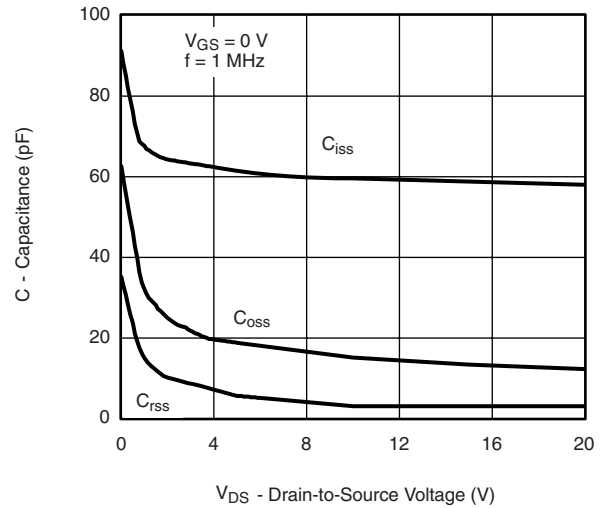
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

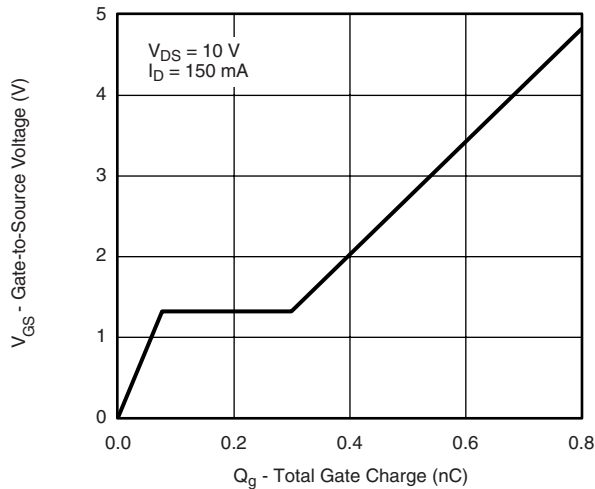
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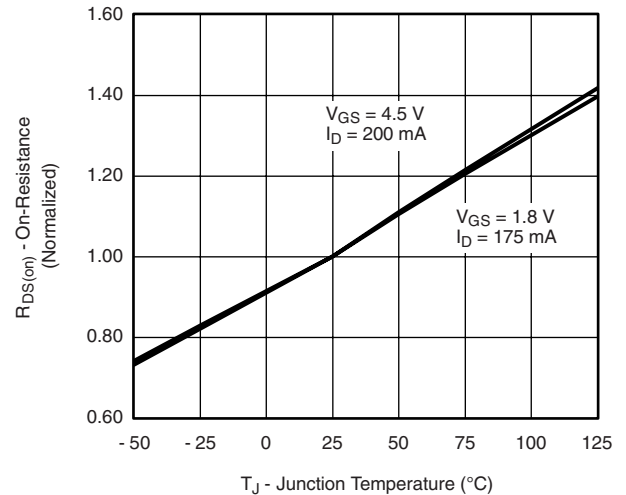
On-Resistance vs. Drain Current



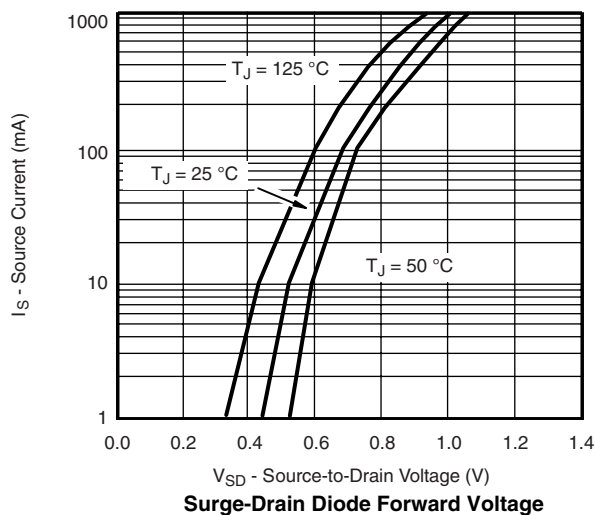
Capacitance



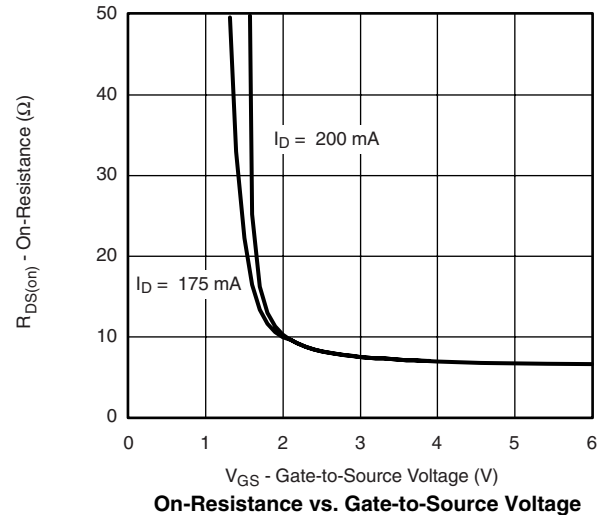
Gate Charge



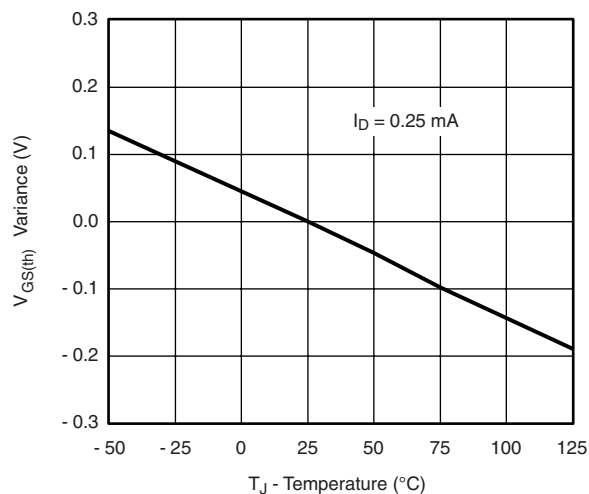
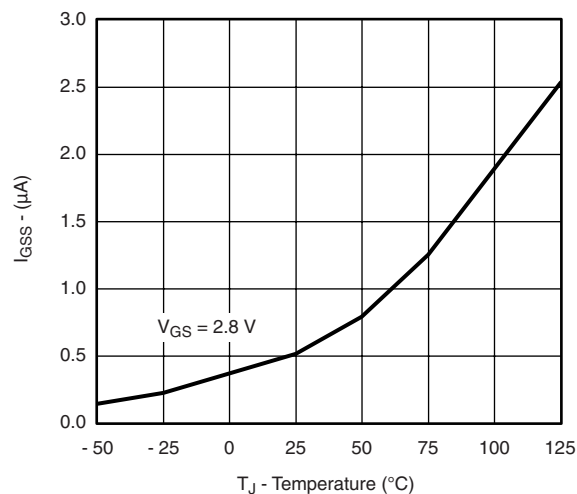
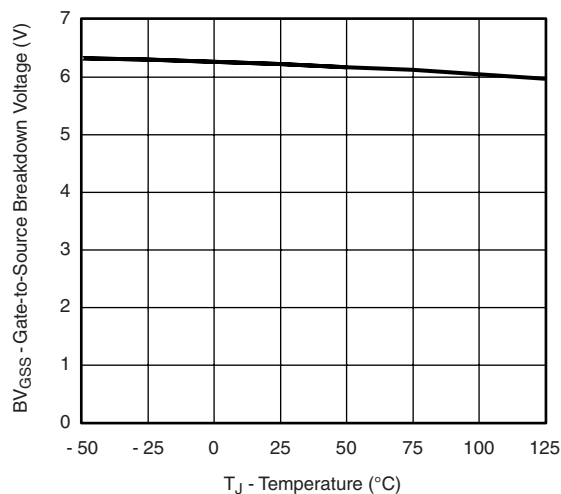
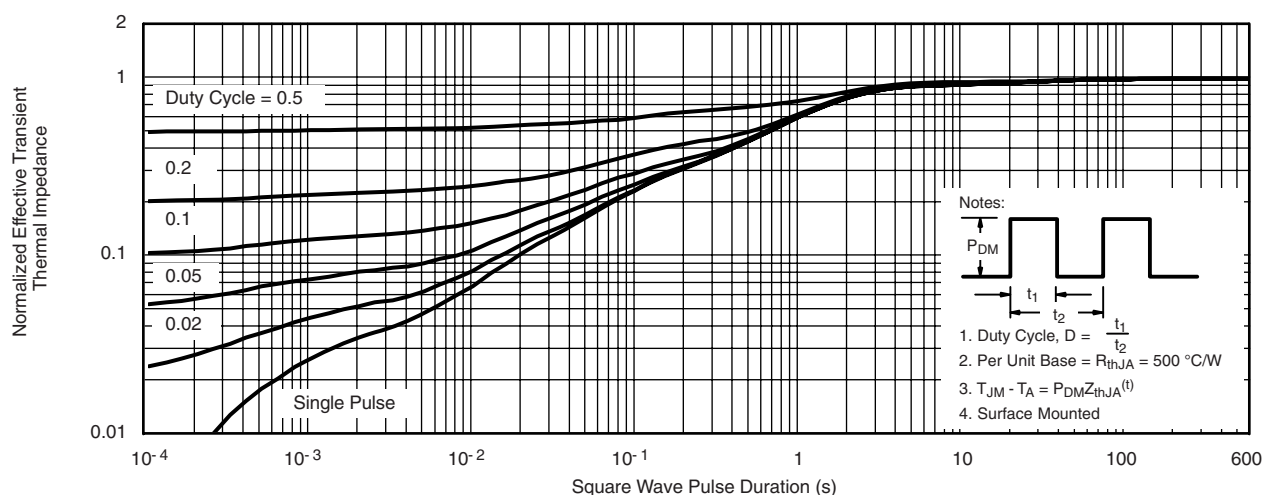
On-Resistance vs. Junction Temperature



Surge-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

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