



Si1032R/X
Vishay Siliconix

N-Channel 20-V (D-S) MOSFET

TrenchFET®

MOSFETs

1.5-V Rated



**ESD Protected
2000 V**

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

FEATURES

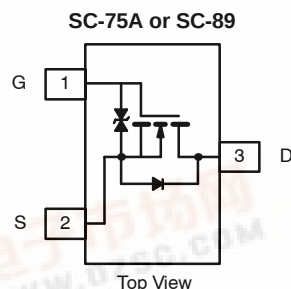
- Low-Side Switching
- Low On-Resistance: 5 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 35 ns
- 1.8-V Operation
- Gate-Source ESD Protection

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 Free)
 SC-89 (SOT-490): Si1032X-T1
 SC-89 (SOT-490): Si1032X-T1—E3 (Lead Free)

Marking Code: G

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Si1032R		Si1032X		Unit
			5 secs	Steady State	5 secs	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

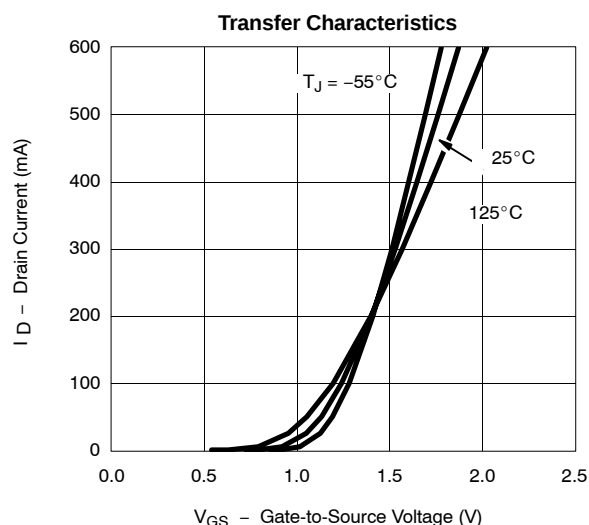
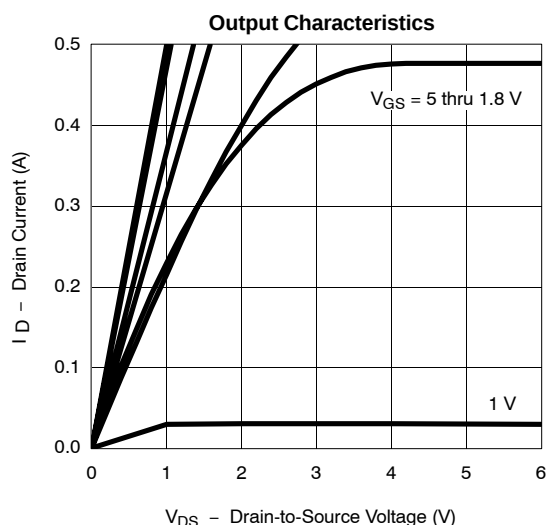
Notes:
 a. Surface Mounted on FR4 Board.

SPECIFICATIONS (T _A = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.40	0.7	1.2	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±2.8 V		±0.5	±1.0	μA
		V _{DS} = 0 V, V _{GS} = ±4.5 V		±1.0	±3.0	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55°C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 4.5 V	250			mA
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 200 mA			5	Ω
		V _{GS} = 2.5 V, I _D = 175 mA			7	
		V _{GS} = 1.8 V, I _D = 150 mA			9	
		V _{DS} = 1.5 V, I _D = 40 mA			10	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 200 mA		0.5		S
Diode Forward Voltage ^a	V _{SD}	I _S = 150 mA, V _{GS} = 0 V			1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 150 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 V, R _L = 47 Ω I _D ≅ 200 mA, V _{GEN} = 4.5 V, R _G = 10 Ω			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 ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

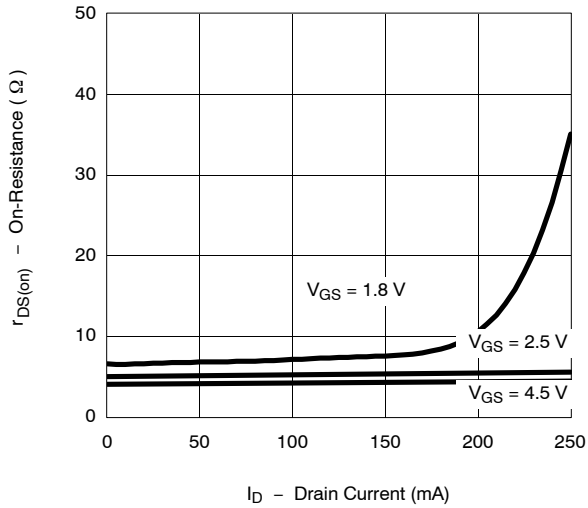
TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED)



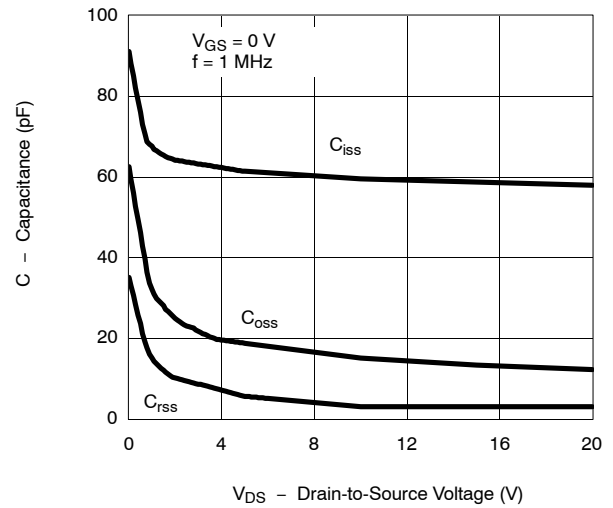


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS NOTED)

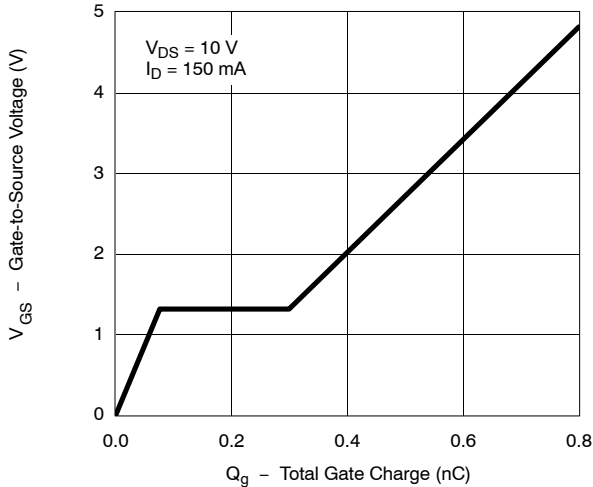
On-Resistance vs. Drain Current



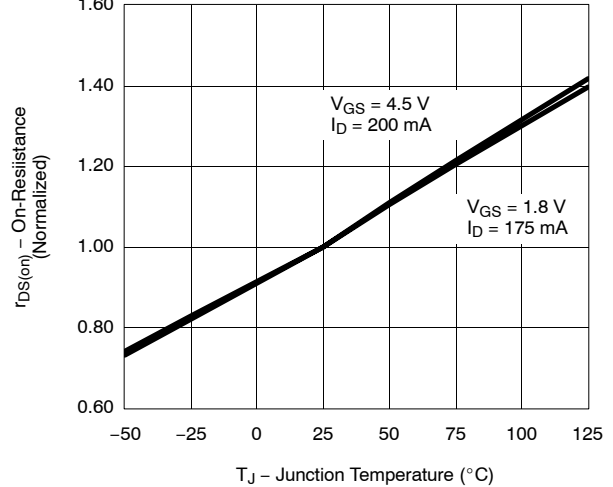
Capacitance



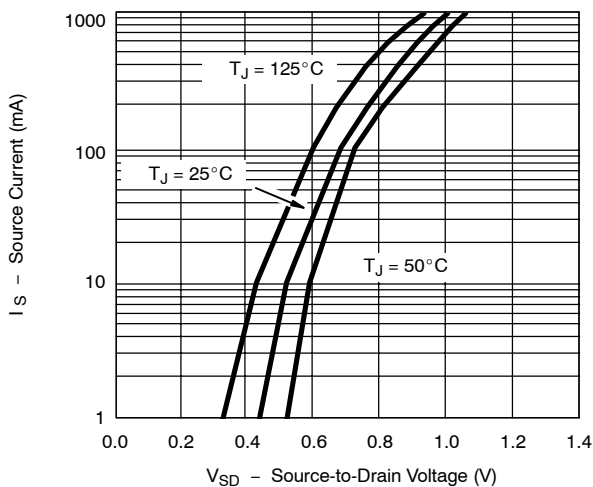
Gate Charge



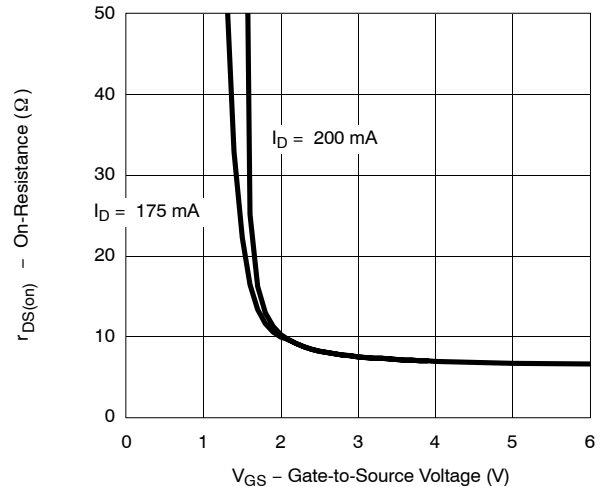
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS NOTED)

