

RoHS

COMPLIANT HALOGEN

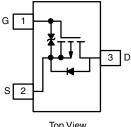
FREE

Vishay Siliconix

P-Channel 1.8 V (G-S) MOSFET

PRODUCT SUMMARY				
V _{DS} (V)	R_{DS(on)} (Ω)	I _D (mA)		
- 20	1.2 at V _{GS} = - 4.5 V	- 350		
	1.6 at V _{GS} = - 2.5 V	- 300		
	2.7 at V _{GS} = - 1.8 V	- 150		

SC-75A or SC-89



SC-75A (SOT-416): Si1013R - Marking Code D SC-89 (SOT-490): Si1013X - Marking Code B

Top View

Ordering Information: Si1013R-T1-GE3 (SC-75A, Lead (Pb)-free and Halogen-free) Si1013X-T1-GE3 (SC-89, Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 ٠ Definition
- High-Side Switching
- Low On-Resistance: 1.2 Ω
- Low Threshold: 0.8 V (Typ.) •
- Fast Switching Speed: 14 ns •
- 1.8 V Operation •
- TrenchFET[®] Power MOSFETs
- 2000 V ESD Protection
- Compliant to RoHS Directive 2002/95/EC •

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, • Memories
- **Battery Operated Systems** ٠
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

BENEFITS

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

Parameter	Symbol	5 s	Steady State	Unit	
Drain-Source Voltage		V _{DS}	- 20		V
Gate-Source Voltage		V _{GS}	± 6		v
Continuous Drain Current $(T_J = 150 \ ^{\circ}C)^{b}$	T _A = 25 °C	I _D	- 400	- 350	
	T _A = 85 °C		- 300	- 275	
Pulsed Drain Current ^a		I _{DM}	- 1000		mA
Continuous Source Current (Diode Conduction) ^b	۱ _S	- 275	- 250		
	T _A = 25 °C	- P _D	175	150	mW
Maximum Power Dissipation ^b for SC-75	T _A = 85 °C		90	80	
	T _A = 25 °C		275	250	
Maximum Power Dissipation ^b for SC-89	T _A = 85 °C		160	140	
Operating Junction and Storage Temperature Ran	T _J , T _{stg}	- 55 to 150		°C	
Gate-Source ESD Rating (HBM, Method 3015)	ESD	2000		V	

Notes:

a. Pulse width limited by maximum junction temperature.

b. Surface mounted on FR4 board.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \ \mu A$	- 0.45			V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, \text{ V}_{GS} = \pm 4.5 \text{ V}$		± 1	± 2	μA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 16 V, V _{GS} = 0 V		- 0.3	- 100	nA	
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 85 ^{\circ}\text{C}$			- 5	μA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} = -5 V, V_{GS} = -4.5 V$	- 700			mA	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 350 mA		0.8	1.2	Ω	
		V _{GS} = - 2.5 V, I _D = - 300 mA		1.2	1.6		
		V _{GS} = - 1.8 V, I _D = - 150 mA		1.8	2.7		
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 10 V, I _D = - 250 mA		0.4		S	
Diode Forward Voltage ^a	V _{SD}	I _S = - 150 mA, V _{GS} = 0 V		- 0.8	- 1.2	V	
Dynamic ^b	•						
Total Gate Charge	Qg			1500			
Gate-Source Charge	Q _{gs}	V_{DS} = - 10 V, V_{GS} = - 4.5 V, I_{D} = - 250 mA		150		рС	
Gate-Drain Charge	Q _{gd}			450			
Turn-On Delay Time	t _{d(on)}			5			
Rise Time	t _r	V_{DD} = - 10 V, R_L = 47 Ω		9			
Turn-Off Delay Time	t _{d(off)}	$\text{I}_\text{D}\cong$ - 200 mA, V_GEN = - 4.5 V, R_g = 10 Ω		35		ns	
Fall Time	t _f			11			

Notes:

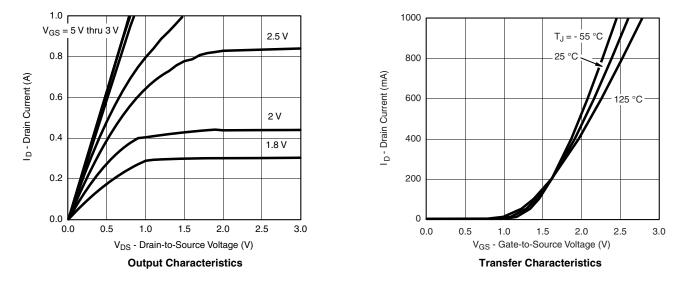
a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

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 ($T_A = 25 \text{ °C}$, unless otherwise noted)

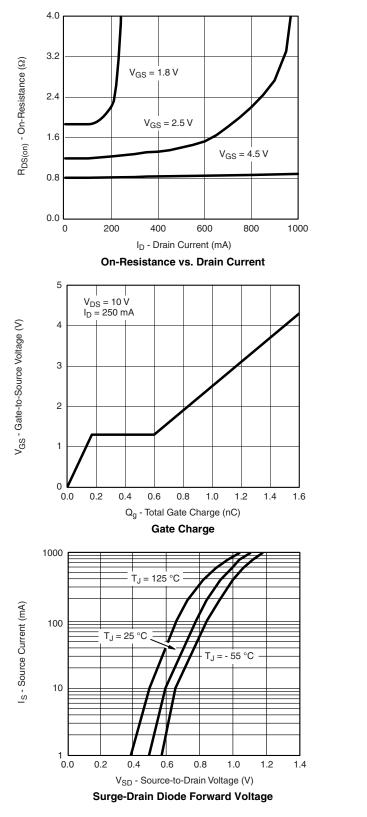
For the following graphs, P-Channel negative polarities for all voltage and current values are represented as positive values.

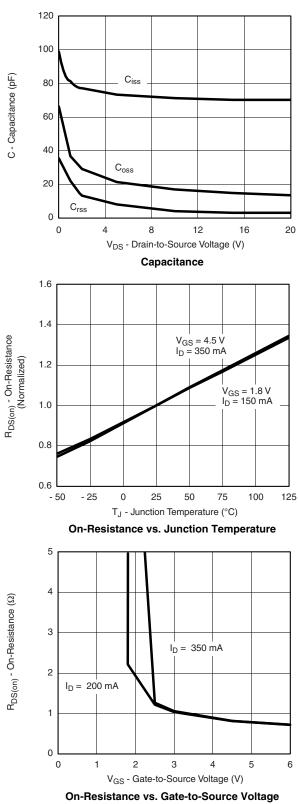




Si1013R/X Vishay Siliconix

TYPICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$, unless otherwise noted)



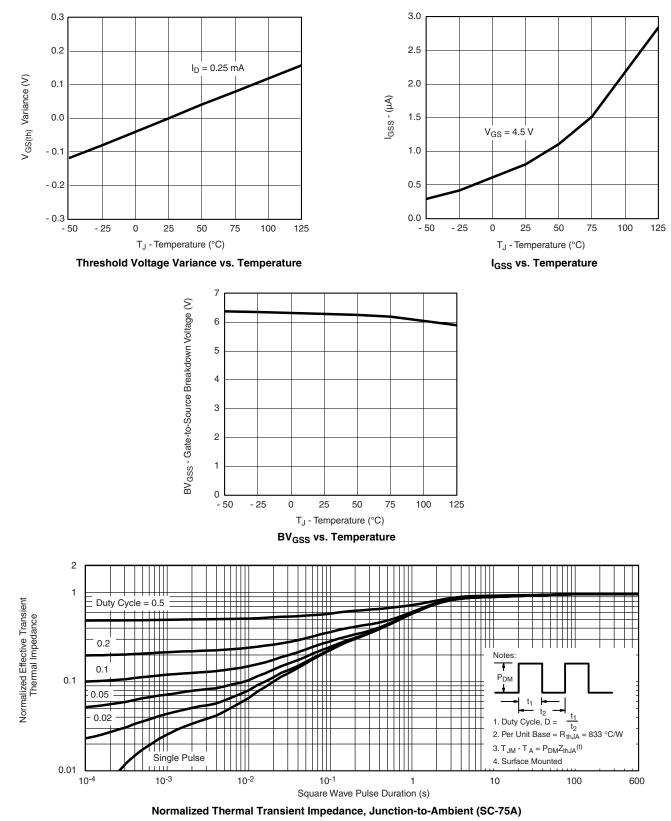


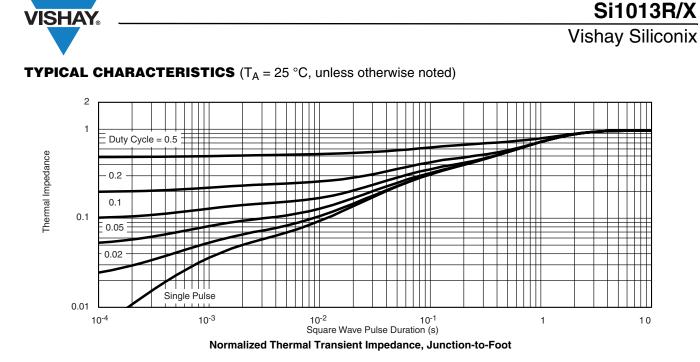
Si1013R/X

Vishay Siliconix



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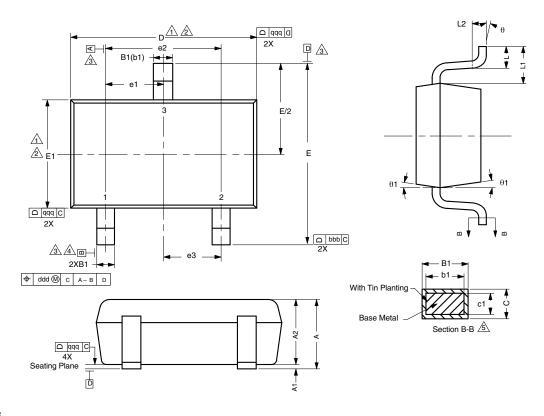


Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg271167.



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SC-75A: 3 Leads



DWG: 5868

Notes

Dimensions in millimeters will govern.

- ⚠Dimension D does not include mold flash, protrusions or gate burrs. Mold flash protrusions or gate burrs shall not exceed 0.10 mm per end. Dimension E1 does not include Interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.10 mm per side.
- 2 Dimensions D and E1 are determined at the outmost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
- A Datums A, B and D to be determined 0.10 mm from the lead tip.

A Terminal positions are shown for reference only.

These dimensions apply to the flat section of the lead between 0.08 mm and 0.15 mm from the lead tip.

DIMENSIONS	TOLERANCES		
aaa	0.10		
bbb	0.10		
ссс	0.10		
ddd	0.10		

DIM.	MILLIMETERS			NOTE
	MIN.	NOM.	MAX.	NOTE
А	-	-	0.80	
A1	0.00	-	0.10	
A2	0.65	0.70	0.80	
B1	0.19	-	0.24	5
b1	0.17	-	0.21	
с	0.13	-	0.15	5
c1	0.10	-	0.12	5
D	1.48	1.575	1.68	1, 2
E	1.50	1.60	1.70	
E1	0.66	0.76	0.86	1, 2
e1	0.50 BSC			
e2	1.00 BSC			
e3	0.50 BSC			
L	0.15	0.205	0.30	
L1	0.40 ref.			
L2	0.15 BSC			
q	0°	-	8°	
q1	4°	-	10°	

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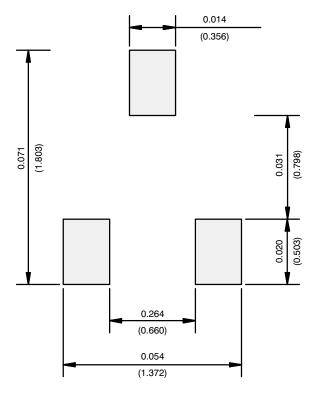
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Application Note 826

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RECOMMENDED MINIMUM PADS FOR SC-75A: 3-Lead



Recommended Minimum Pads Dimensions in Inches/(mm)

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