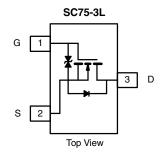




N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY				
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)	
	0.420 at V _{GS} = 4.5 V	0.606		
20	0.501 at V _{GS} = 2.5 V	0.505	0.92	
	0.660 at V _{GS} = 1.8 V	0.150		



Ordering Information:

Si1046R-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- TrenchFET® Power MOSFET: 1.8 V Rated
- ESD Protected: 2000 V
- Material categorization: For definitions of compliance please see www.vishav.com/doc?99912



HALOGEN **FREE**

APPLICATIONS

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

Marking Code: J

ABSOLUTE MAXIMUM RATINGS	S (T _A = 25 °C, un	less otherwise	noted)		
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V _{DS}	20	V	
Gate-Source Voltage		V _{GS}	± 8	v	
O-ation - David O-and /T - 450 00)8	T _A = 25 °C		0.606 ^{b, c}		
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 70 °C	l _D	0.485 ^{b, c}	^	
Pulsed Drain Current		I _{DM}	2.5	A	
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	0.21 ^{b, c}		
M ·	T _A = 25 °C	D.	0.25 ^{b, c}	W	
Maximum Power Dissipation ^a	T _A = 70 °C	P _D	0.16 ^{b, c}	VV	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS						
Parameter	Symbol	Typical	Maximum	Unit		
Mariana Laratina ta Antriando d	t ≤ 5 s	R _{thJA}	440	530	°C/W	
Maximum Junction-to-Ambient ^{b, d}	Steady State		540	650		

Notes:

- a. Based on $T_C = 25$ °C.
- b. Surface mounted on 1" x 1" FR4 board.
- d. Maximum under steady state conditions is 650 °C/W.

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SPECIFICATIONS ($T_J = 25 ^{\circ}\text{C}_s$	Symbol	Test Conditions	Min.	Tym	Max.	Unit	
	Symbol	rest Conditions	IVIII.	Тур.	iviax.	Unit	
Static		V 0.V L 050 vA			I		
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	20			V	
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		20.5		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	2		- 2.12			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.35		0.95	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			± 30	mA	
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}$			1	μΑ	
Zero date voltage Drain Gurrent		$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 85 ^{\circ}\text{C}$			10	μΑ	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} = \ge 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	2.5			Α	
		V _{GS} = 4.5 V, I _D = 0.606 A		0.336	0.420		
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 2.5 V, I _D = 0.505 A		0.395	0.501	Ω	
		V _{GS} = 1.8 V, I _D = 0.150 A		0.438	0.660	İ	
Forward Transconductance	9 _{fs}	V _{DS} = 10 V, I _D = 0.606 A		2.1		S	
Dynamic ^b			L				
Input Capacitance	C _{iss}			66		pF	
Output Capacitance	C _{oss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz		17			
Reverse Transfer Capacitance	C _{rss}			7			
·		V _{DS} = 10 V, V _{GS} = 5 V, I _D = 0.606 A		0.99	1.49		
Total Gate Charge	Q_g			0.92	1.38	nC	
Gate-Source Charge	Q _{gs}	$V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 0.606 \text{ A}$		0.15			
Gate-Drain Charge	Q _{gd}			0.30			
Gate Resistance	R _q	f = 1 MHz		212		Ω	
Turn-On Delay Time	t _{d(on)}			17	26		
Rise Time	t _r	$V_{DD} = 10 \text{ V, R}_{I} = 20.8 \Omega$		19	28.5	ns	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 0.48 \text{ A, V}_{GEN} = 4.5 \text{ V, R}_q = 1 \Omega$		76	114		
Fall Time	t _f			27	41		
Drain-Source Body Diode Characteristic	I .						
Pulse Diode Forward Current ^a	I _{SM}				2.5	Α	
Body Diode Voltage	V _{SD}	I _S = 0.48 A		0.8	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}	13 22.1		16	24	nC	
Body Diode Reverse Recovery Charge	Q _{rr}			4.8	7.2	110	
Reverse Recovery Fall Time		$I_F = 1 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}$		12.3	1.2	ns	
•	t _a	-					
Reverse Recovery Rise Time	t _b]		3.7		<u> </u>	

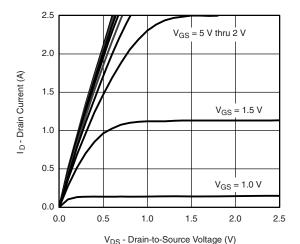
Notes:

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

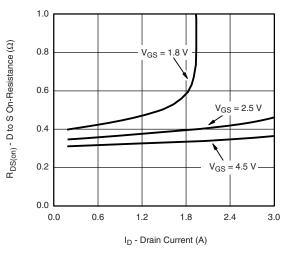
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



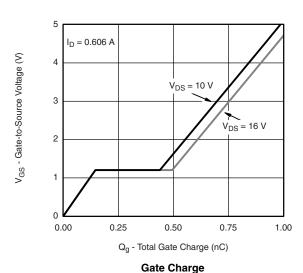
TYPICAL CHARACTERISTICS ($T_A = 25$ °C, unless otherwise noted)

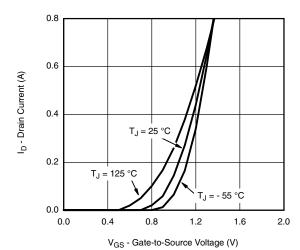


Output Characteristics

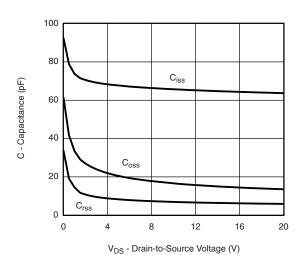


On-Resistance vs. Drain Current

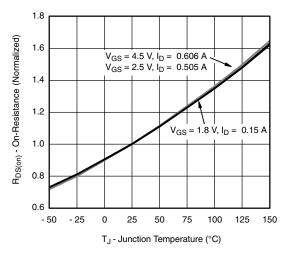




Transfer Characteristics



Capacitance

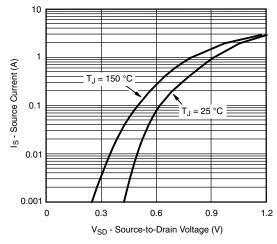


On-Resistance vs. Junction Temperature

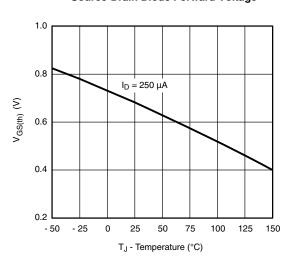
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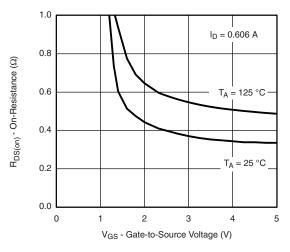
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



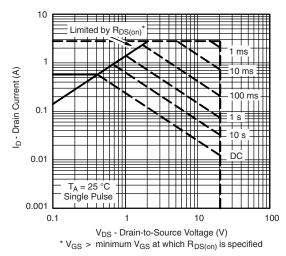
Source-Drain Diode Forward Voltage



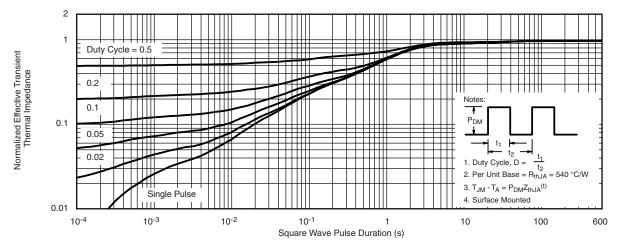
Threshold Voltage



R_{DS(on)} vs. V_{GS} vs Temperature



Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

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