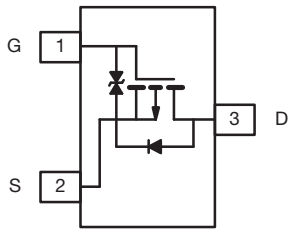
N-Channel 1.5 V (G-S) MOSFET

SC-75A
(SOT-416)



Marking Code: G

PRODUCT SUMMARY	
V_{DS} (V)	20
$R_{DS(on)}$ max. (Ω) at V_{GS} = 4.5 V	5
$R_{DS(on)}$ max. (Ω) at V_{GS} = 2.5 V	7
$R_{DS(on)}$ max. (Ω) at V_{GS} = 1.8 V	9
$R_{DS(on)}$ max. (Ω) at V_{GS} = 1.5 V	10
Q_g typ. (nC)	750
I_D (A)	200
Configuration	Single

FEATURES

- TrenchFET® power MOSFETs: 1.5 V rated
- Low-side switching
- Low on-resistance: 5 W
- Low threshold: 0.9 V (typ.)
- Fast switching speed: 35 ns
- Enhance power dissipation and lower R_{thJC}
- 2000 V ESD protection
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

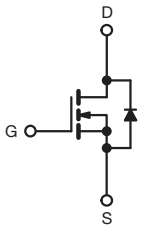
RoHS COMPLIANT
HALOGEN FREE

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



N-Channel MOSFET

ORDERING INFORMATION	
Package	SC-75A
Lead (Pb)-free and halogen-free	Si1032R-T1-GE3

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

PARAMETER		SYMBOL	Si1032R		Si1032X [b]		UNIT
			5 s	STEADY STATE	5 s	STEADY STATE	
Drain-source voltage		V_{DS}	20				V
Gate-source voltage		V_{GS}	± 6				V
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		mA
Continuous source current (diode conduction) [a]		I_S	250	200	300	240	mA
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	mW
Operating junction and storage temperature range		T_J, T_{stg}	- 55 to 150				°C
Gate-source ESD rating (HBM, method 3015)		ESD	2000				V

Note

a. Surface mounted on FR4 board
b. Si1032X, product End of Life November - 2024

SPECIFICATIONS (T_A = 25 °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 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_{GS} = 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 = 250 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	

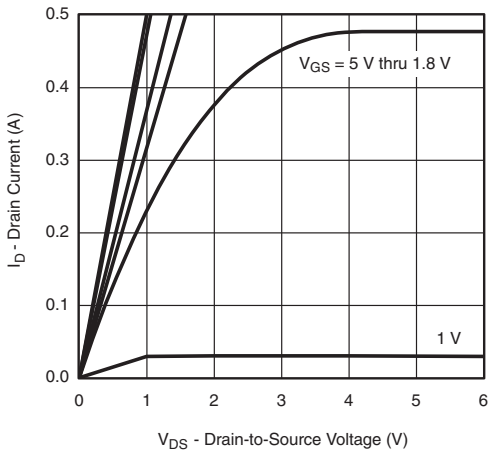
Notes

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

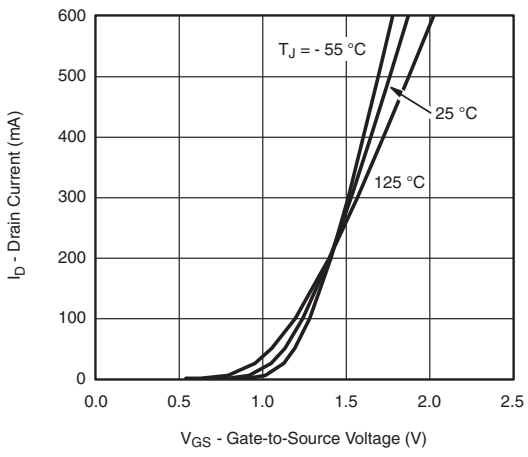
b. Guaranteed by design, not subject to production testing

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)

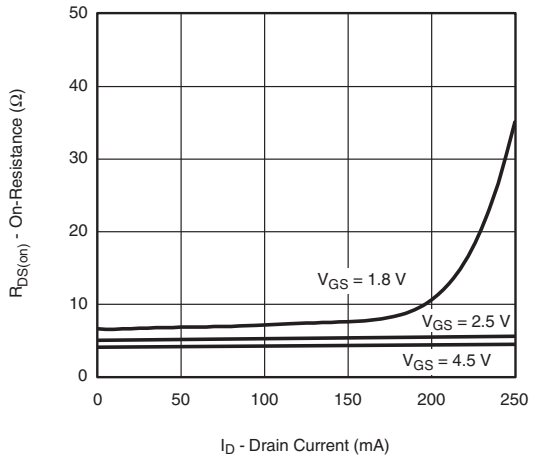


Output Characteristics

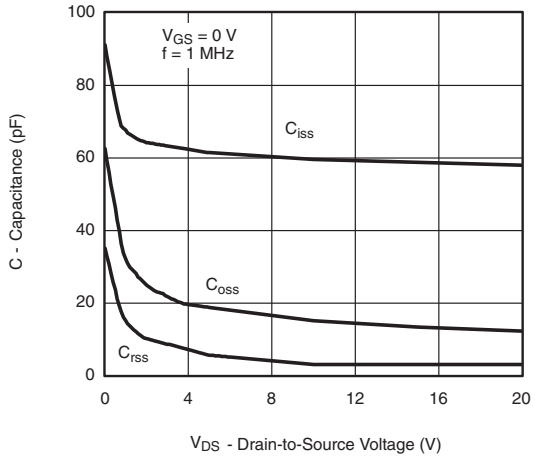


Transfer Characteristics

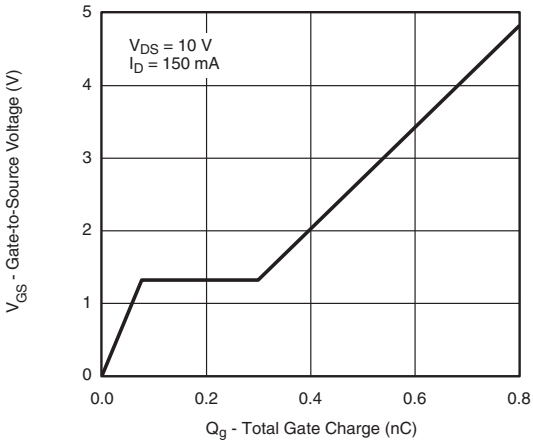
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



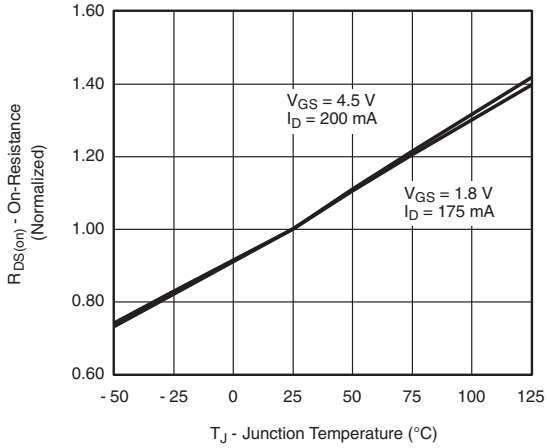
On-Resistance vs. Drain Current



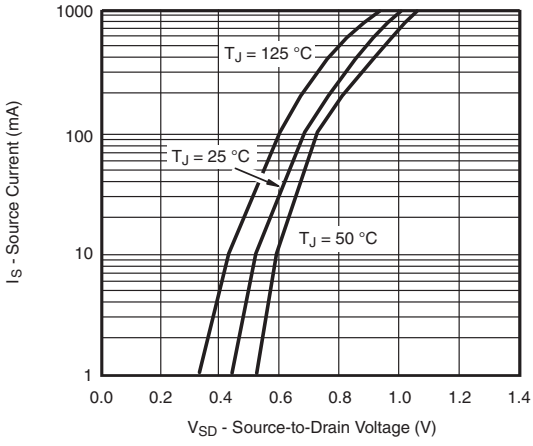
Capacitance



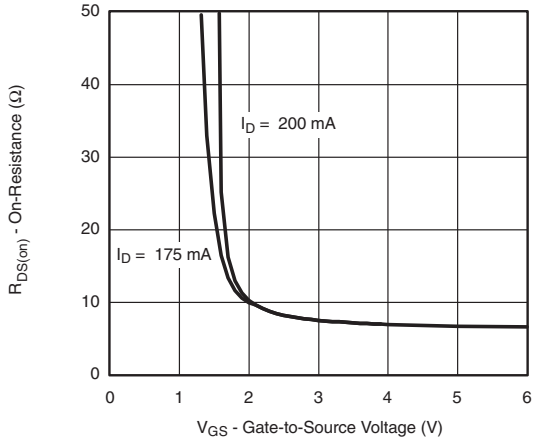
Gate Charge



On-Resistance vs. Gate-to-Source Voltage

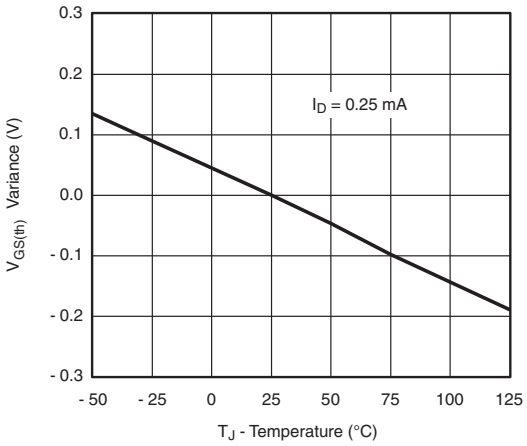


Surge-Drain Diode Forward Voltage

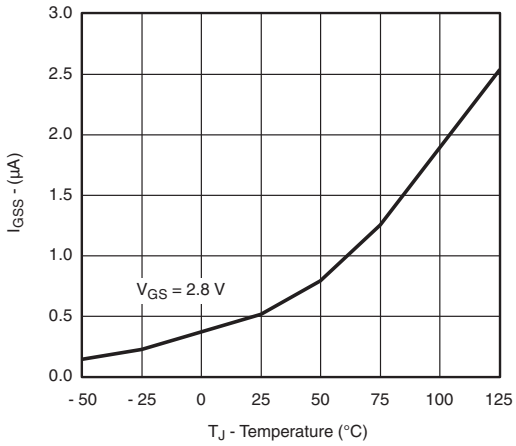


On-Resistance vs. Gate-to-Source Voltage

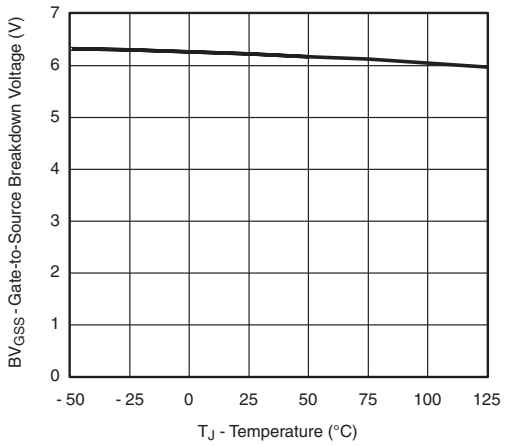
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



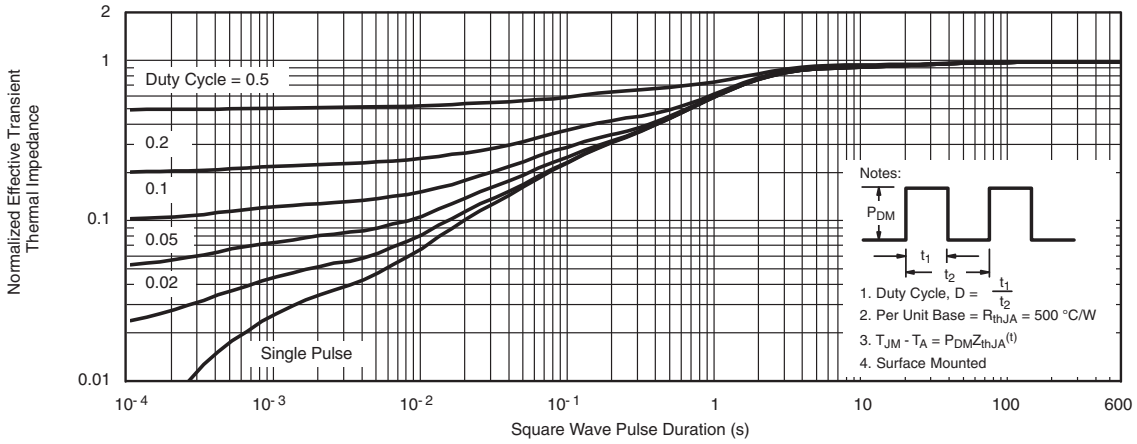
Threshold Voltage Variance vs. Temperature



IGSS vs. Temperature



BV_{GSS} vs. Temperature



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

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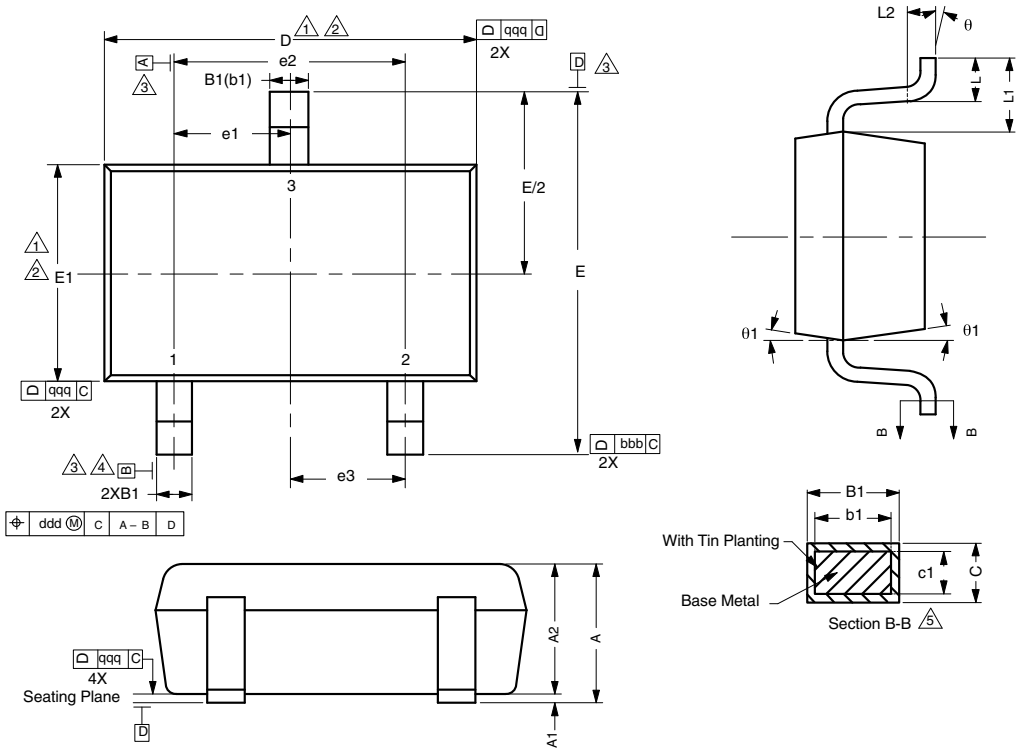
SC-75A: 3 Leads



DWG: 5868

Notes

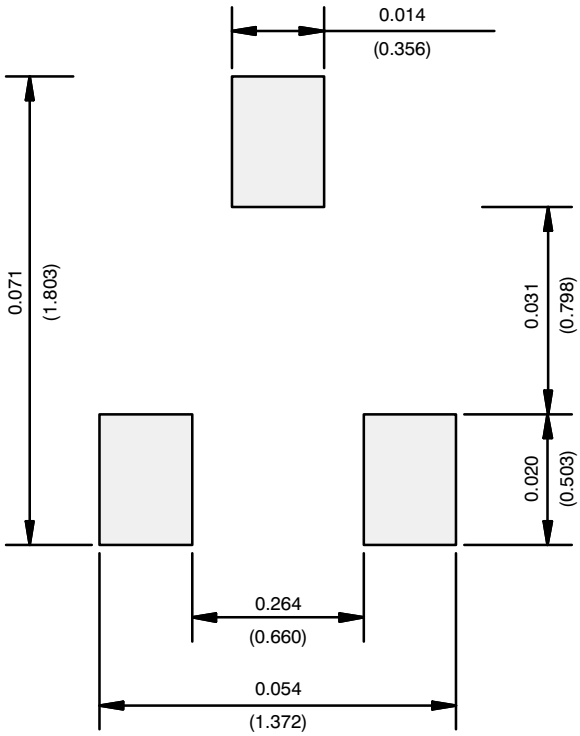
Dimensions in millimeters will govern.

1. 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.
3. Datums A, B and D to be determined 0.10 mm from the lead tip.
4. Terminal positions are shown for reference only.
5. 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
ccc	0.10
ddd	0.10

DIM.	MILLIMETERS			NOTE
	MIN.	NOM.	MAX.	
A	-	-	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	
c	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°	

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



Recommended Minimum Pads
Dimensions in Inches/(mm)

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