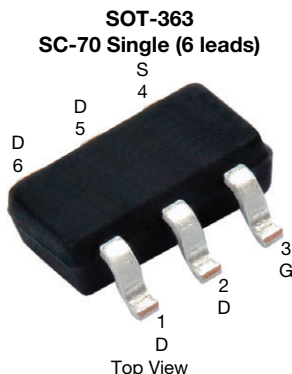


Automotive N-Channel 60 V (D-S) 175 °C MOSFET



Marking code: 8B

PRODUCT SUMMARY	
V_{DS} (V)	60
$R_{DS(on)}$ (Ω) at $V_{GS} = 1.5$ V	1.41
I_D (A)	0.44
Configuration	Single
Package	SC-70

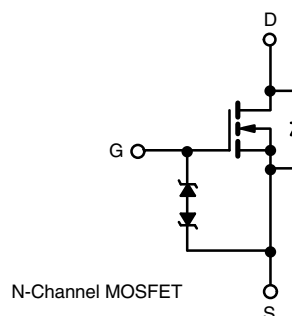
FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_g tested
- Typical ESD protection: 800 V
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912

AUTOMOTIVE
GRADE



RoHS
COMPLIANT
HALOGEN
FREE



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V _{DS}	60	V
Gate-source voltage		V _{GS}	± 8	
Continuous drain current ^a	T _C = 25 °C	I _D	0.44	A
	T _C = 125 °C		0.25	
Continuous source current (diode conduction) ^a		I _S	0.54	
Pulsed drain current ^b		I _{DM}	1.7	
Maximum power dissipation ^b	T _C = 25 °C	P _D	0.43	
	T _C = 125 °C		0.14	
Operating junction and storage temperature range		T _J , T _{sta}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	LIMIT	UNIT	
Junction-to-ambient	R_{thJA}	460	°C/W	
Junction-to-foot (drain)	R_{thJF}	350		

Notes

- Package limited
- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
- When mounted on 1" square PCB (FR4 material)



SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA		60	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		0.45	0.6	1	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 3 V		-	-	± 100	nA
		V _{DS} = 0 V, V _{GS} = ± 8 V		-	-	100	
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = 60 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 60 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 60 V, T _J = 175 °C	-	-	150	
On-state drain current ^a	I _{D(on)}	V _{GS} = 1.5 V	V _{DS} ≥ 5 V	0.5	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 1.5 V	I _D = 2 A	-	0.8	1.41	Ω
		V _{GS} = 1.5 V	I _D = 1.2 A, T _J = 125 °C	-	-	2.4	
		V _{GS} = 1.5 V	I _D = 1.2 A, T _J = 175 °C	-	-	3.1	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 1 A		-	5.5	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	110	140	pF
Output capacitance	C _{oss}			-	19	24	
Reverse transfer capacitance	C _{rss}			-	12	15	
Total gate charge ^c	Q _g	V _{GS} = 4.5 V	V _{DS} = 30 V, I _D = 2.8 A	-	2.7	4.1	nC
Gate-source charge ^c	Q _{gs}			-	0.25	-	
Gate-drain charge ^c	Q _{gd}			-	0.35	-	
Gate resistance	R _g	f = 1 MHz		5.8	9	15.5	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = 30 V, R _L = 30 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _g = 1 Ω		-	12	18	ns
Rise time ^c	t _r			-	21	32	
Turn-off delay time ^c	t _{d(off)}			-	8	12	
Fall time ^c	t _f			-	7	11	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	1.6	A
Forward voltage	V _{SD}	I _F = 0.8 A, V _{GS} = 0		-	0.8	1.2	V

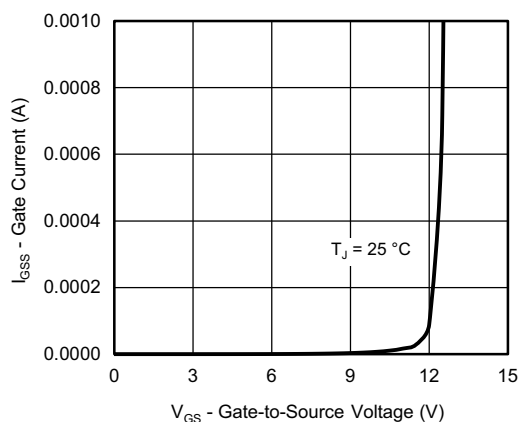
Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature

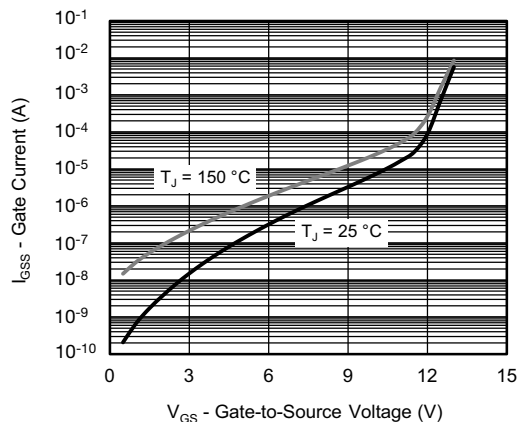
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



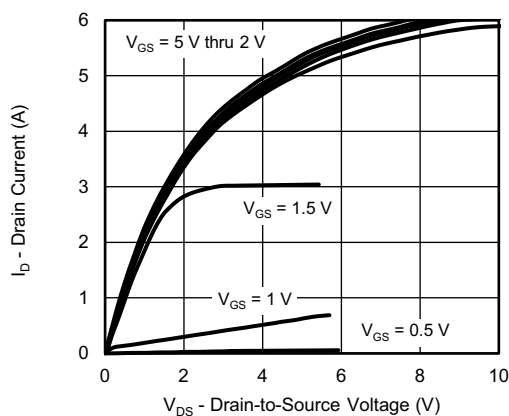
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



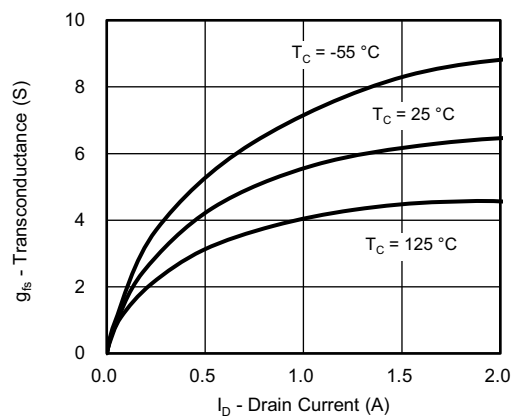
Gate Current vs. Gate-Source Voltage



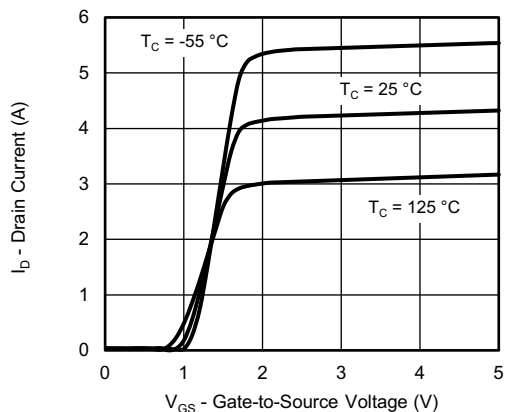
Gate Current vs. Gate-Source Voltage



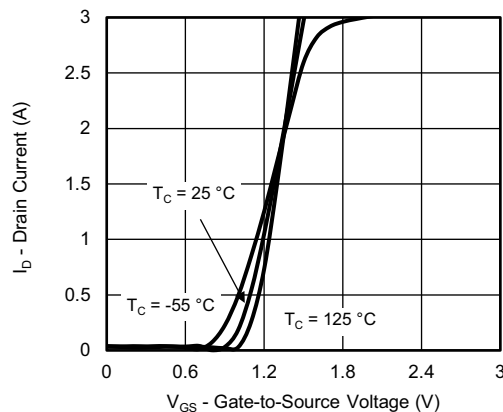
Output Characteristics



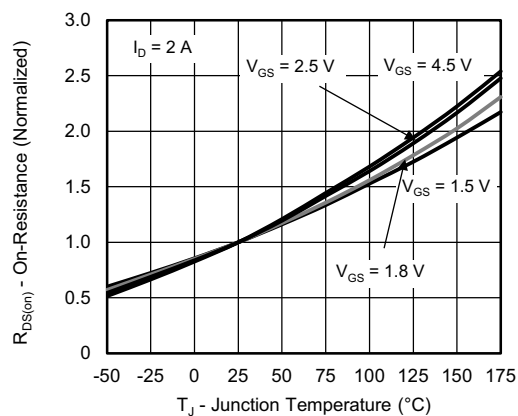
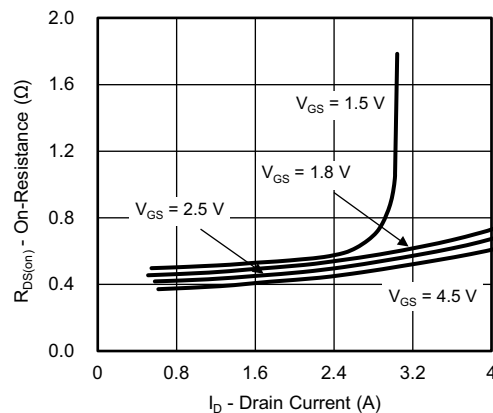
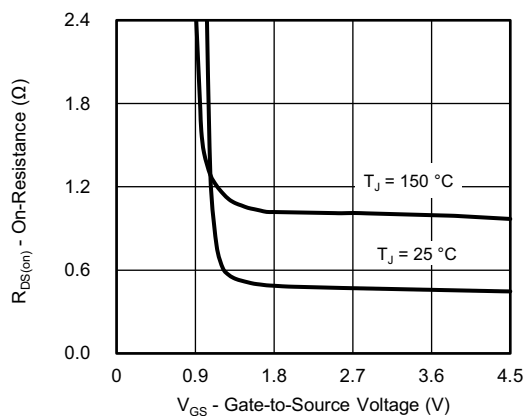
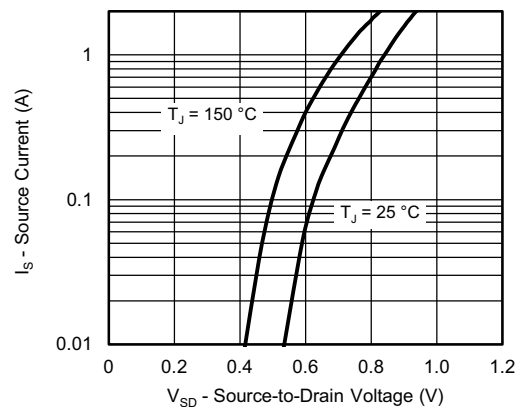
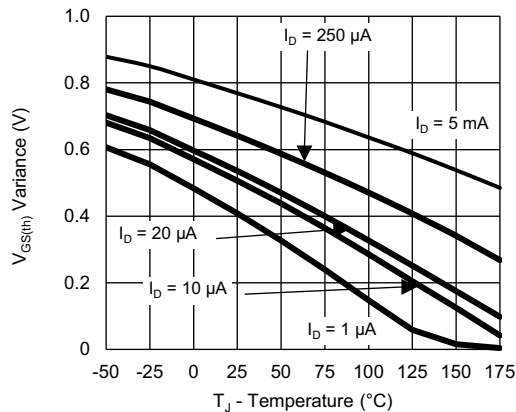
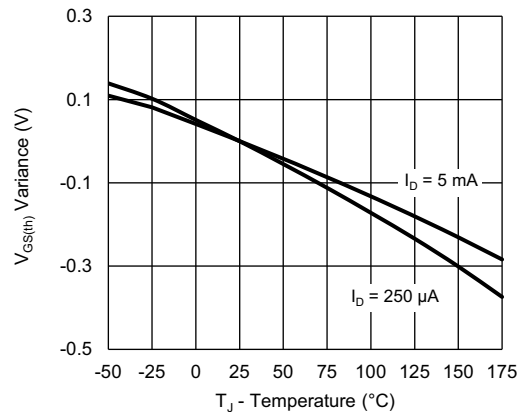
Transconductance



Transfer Characteristics

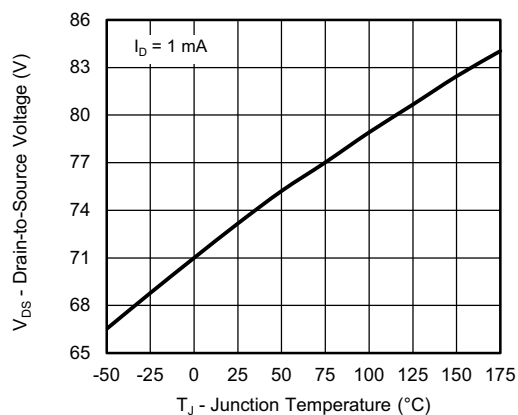


Transfer Characteristics

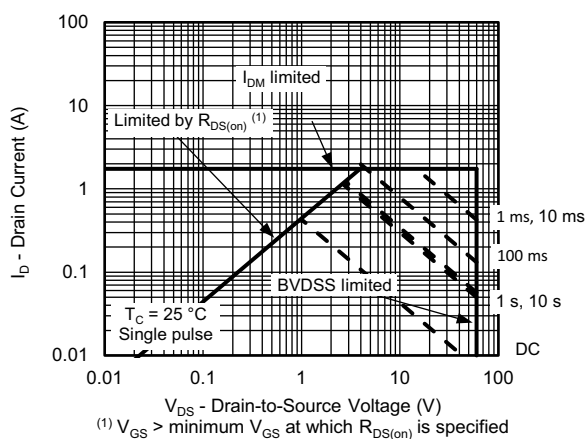
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

On-Resistance vs. Junction Temperature

On-Resistance vs. Drain Current

On-Resistance vs. Gate-to-Source Voltage

Source Drain Diode Forward Voltage

Threshold Voltage

Threshold Voltage



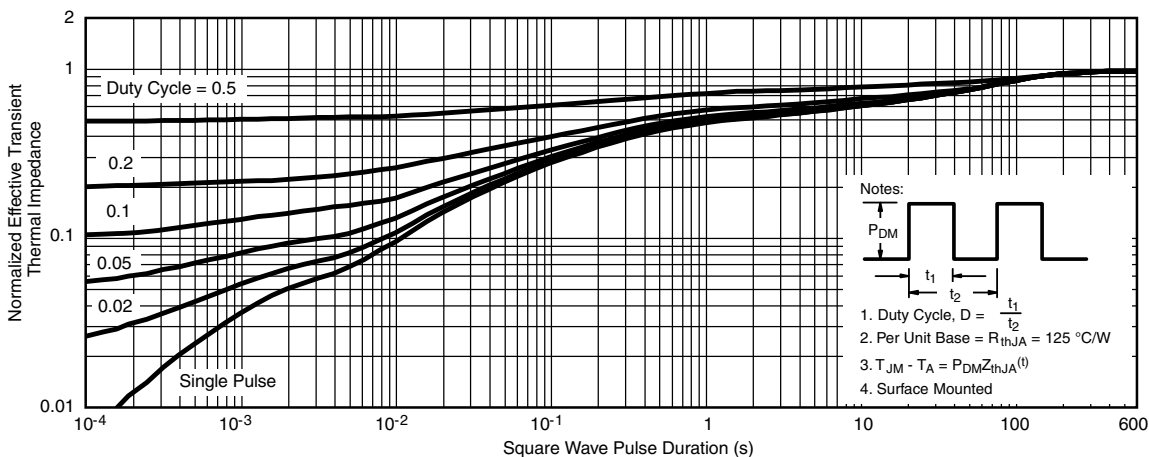
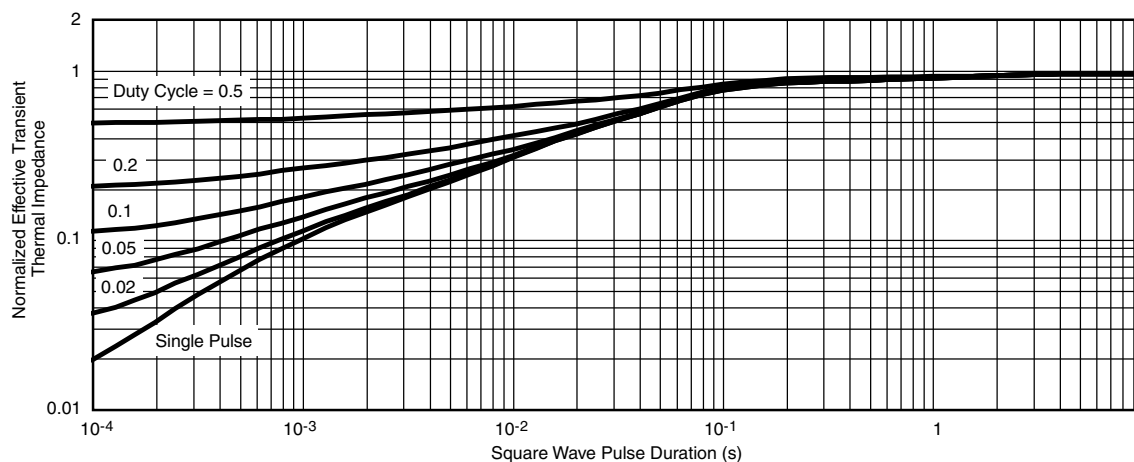
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



Drain Source Breakdown vs. Junction Temperature



Safe Operating Area

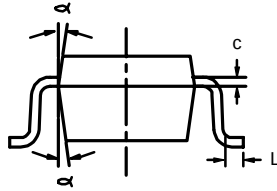
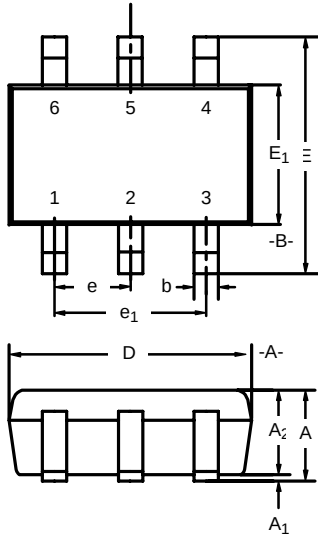
**THERMAL RATINGS** ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)**Normalized Thermal Transient Impedance, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Foot****Note**

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^{\circ}\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Foot ($25\text{ }^{\circ}\text{C}$)
 are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions

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/ppg?75570.



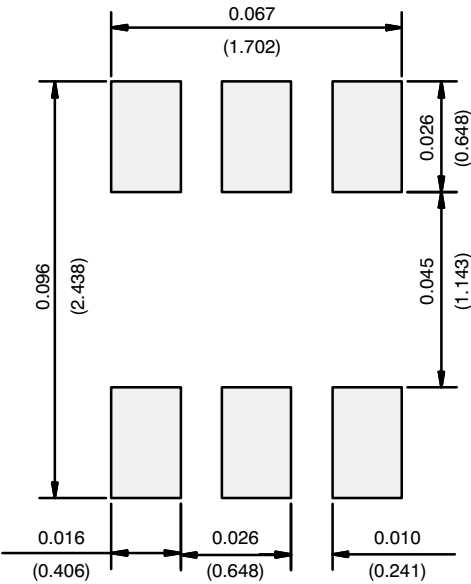
SC-70: 6-LEADS



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A ₁	–	–	0.10	–	–	0.004
A ₂	0.80	–	1.00	0.031	–	0.039
b	0.15	–	0.30	0.006	–	0.012
c	0.10	–	0.25	0.004	–	0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.80	2.10	2.40	0.071	0.083	0.094
E ₁	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e ₁	1.20	1.30	1.40	0.047	0.051	0.055
L	0.10	0.20	0.30	0.004	0.008	0.012
α	7°Nom			7°Nom		

ECN: S-03946—Rev. B, 09-Jul-01
DWG: 5550

RECOMMENDED MINIMUM PADS FOR SC-70: 6-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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