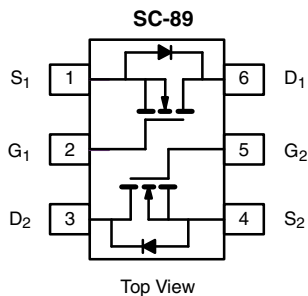


N-Channel 20 V (D-S) MOSFET

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



Marking Code: L

Ordering Information: Si1034X-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET: 1.5 V Rated
- Low-Side Switching
- Low On-Resistance: 5 Ω
- Low Threshold: 0.9 V (typ.)
- Fast Switching Speed: 35 ns (typ.)
- 1.5 V Operation
- Gate-Source ESD Protected: 2000 V
- Compliant to RoHS Directive 2002/95/EC


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

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)					
Parameter	Symbol	5 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}	20		V	
Gate-Source Voltage	V_{GS}	± 5			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	190	180	mA
		$T_A = 85$ °C	140	130	
Pulsed Drain Current ^b	I_{DM}	650			
Continuous Source Current (Diode Conduction)	I_S	450	380		
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	280	250	mW
		$T_A = 85$ °C	145	130	
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.

b. Pulse width limited by maximum junction temperature.

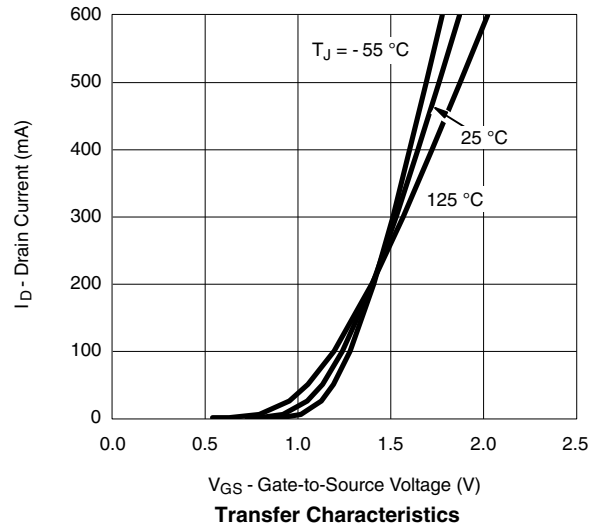
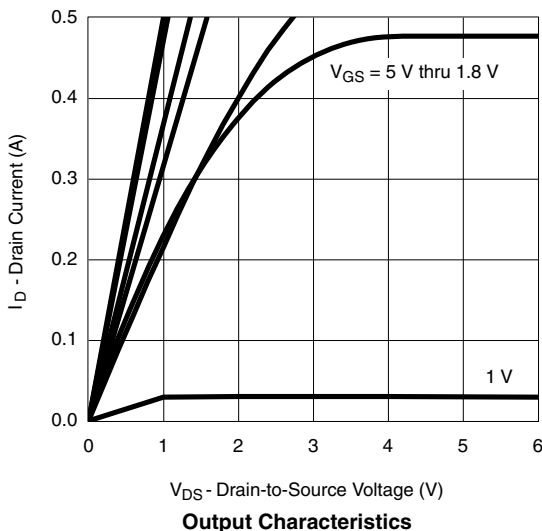
SPECIFICATIONS (T _A = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.40		1.2	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 2.8 V		± 0.5	± 1.0	μA
		V _{DS} = 0 V, V _{GS} = ± 4.5 V		± 1.0	± 3.0	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V		1	500	nA
		V _{DS} = 16 V, V _{GS} = 0 V, T _J = 85 °C			10	μA
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:

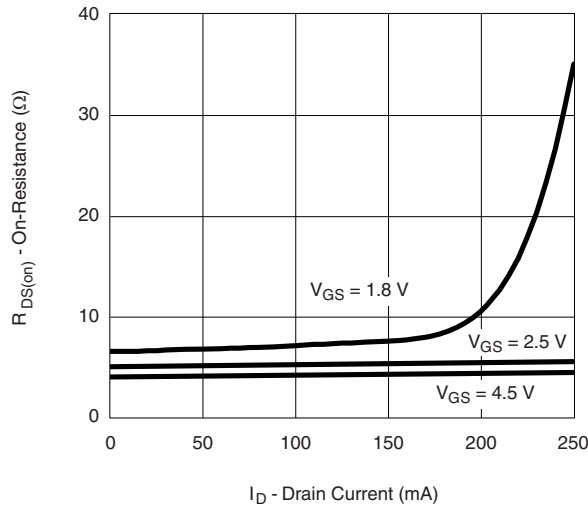
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.

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.

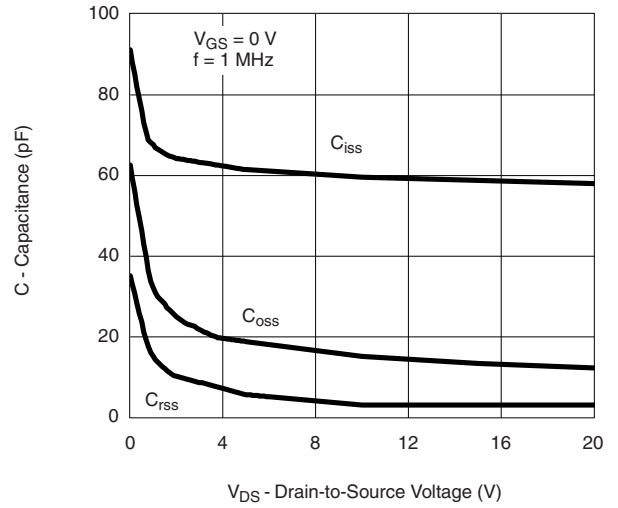
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



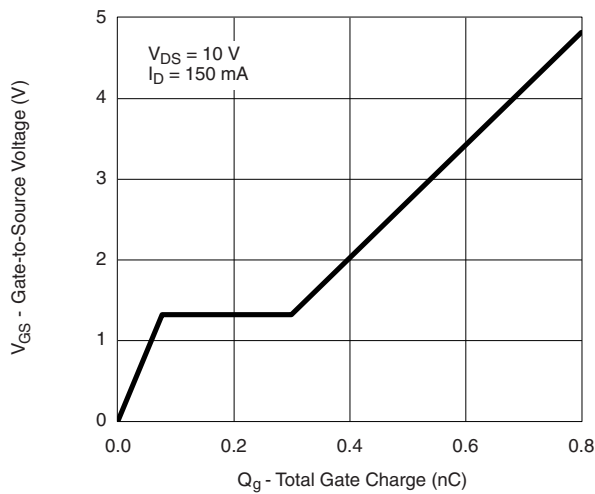
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



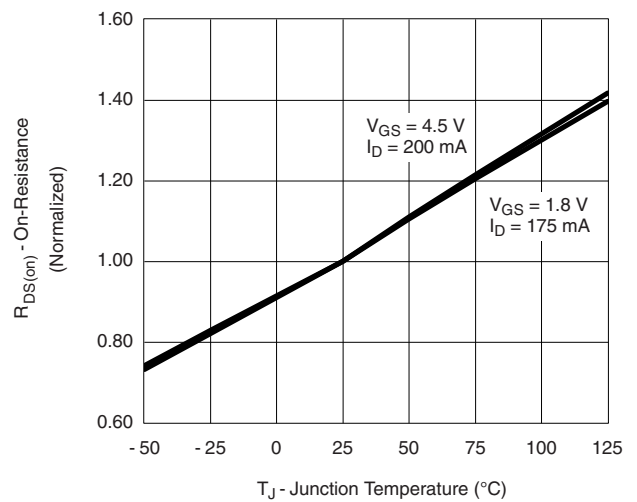
On-Resistance vs. Drain Current



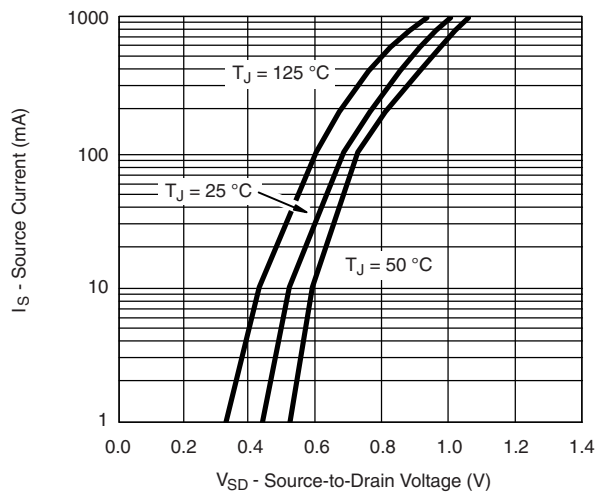
Capacitance



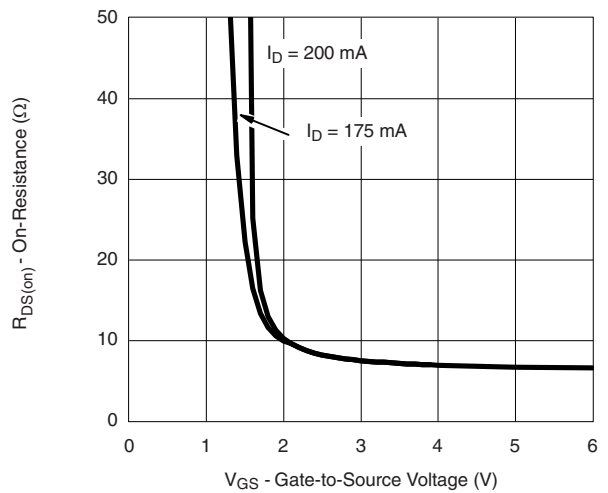
Gate Charge



On-Resistance vs. Junction Temperature

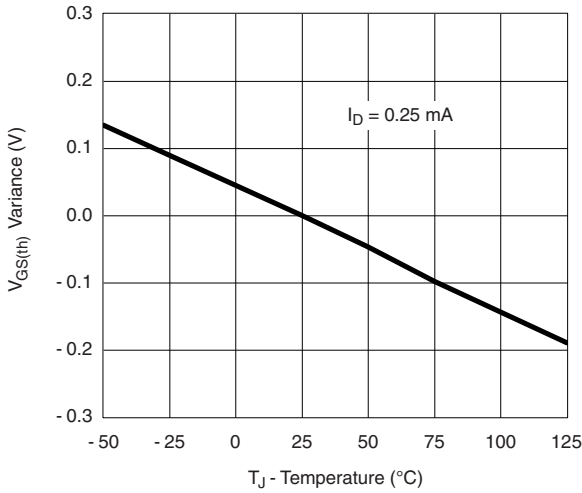


Surge-Drain Diode Forward Voltage

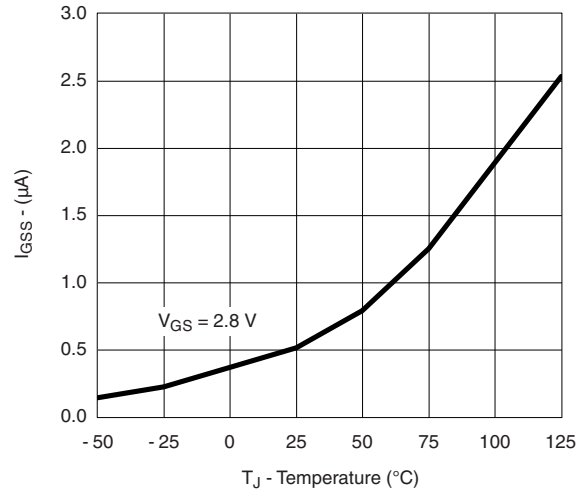


On-Resistance vs. Gate-to-Source Voltage

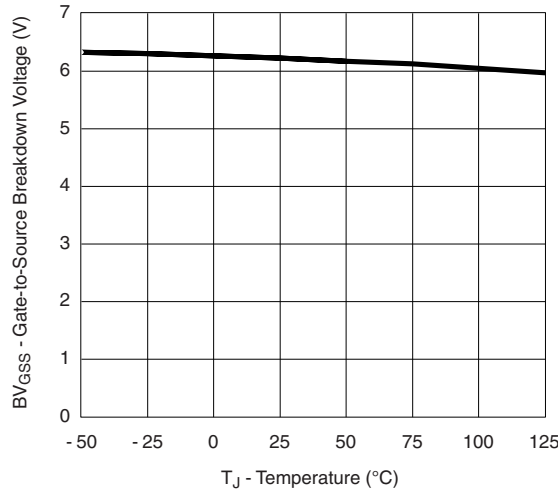
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



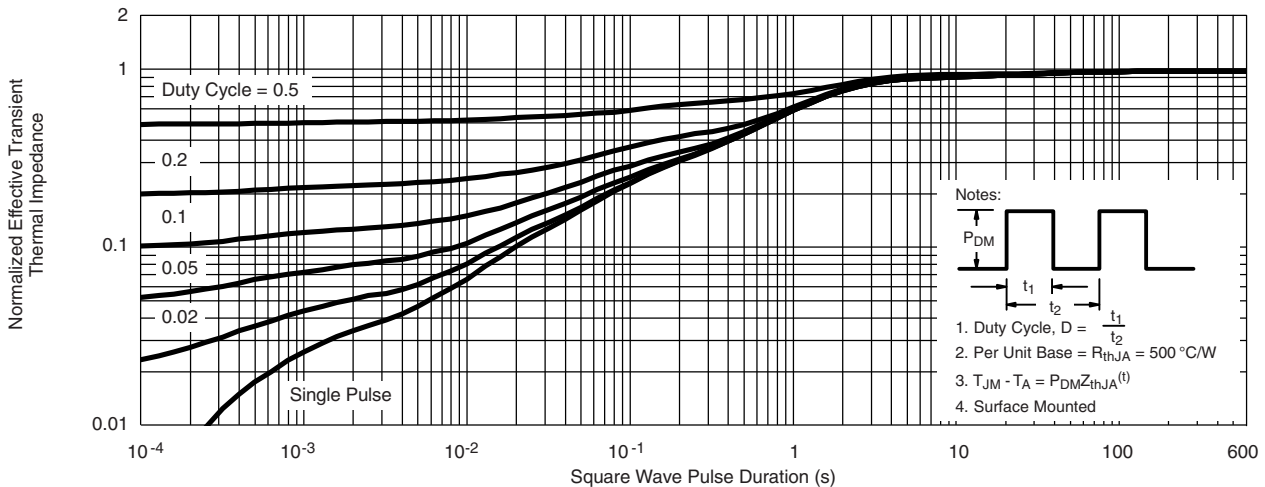
Threshold Voltage Variance vs. Temperature



I_{GSS} vs. Temperature



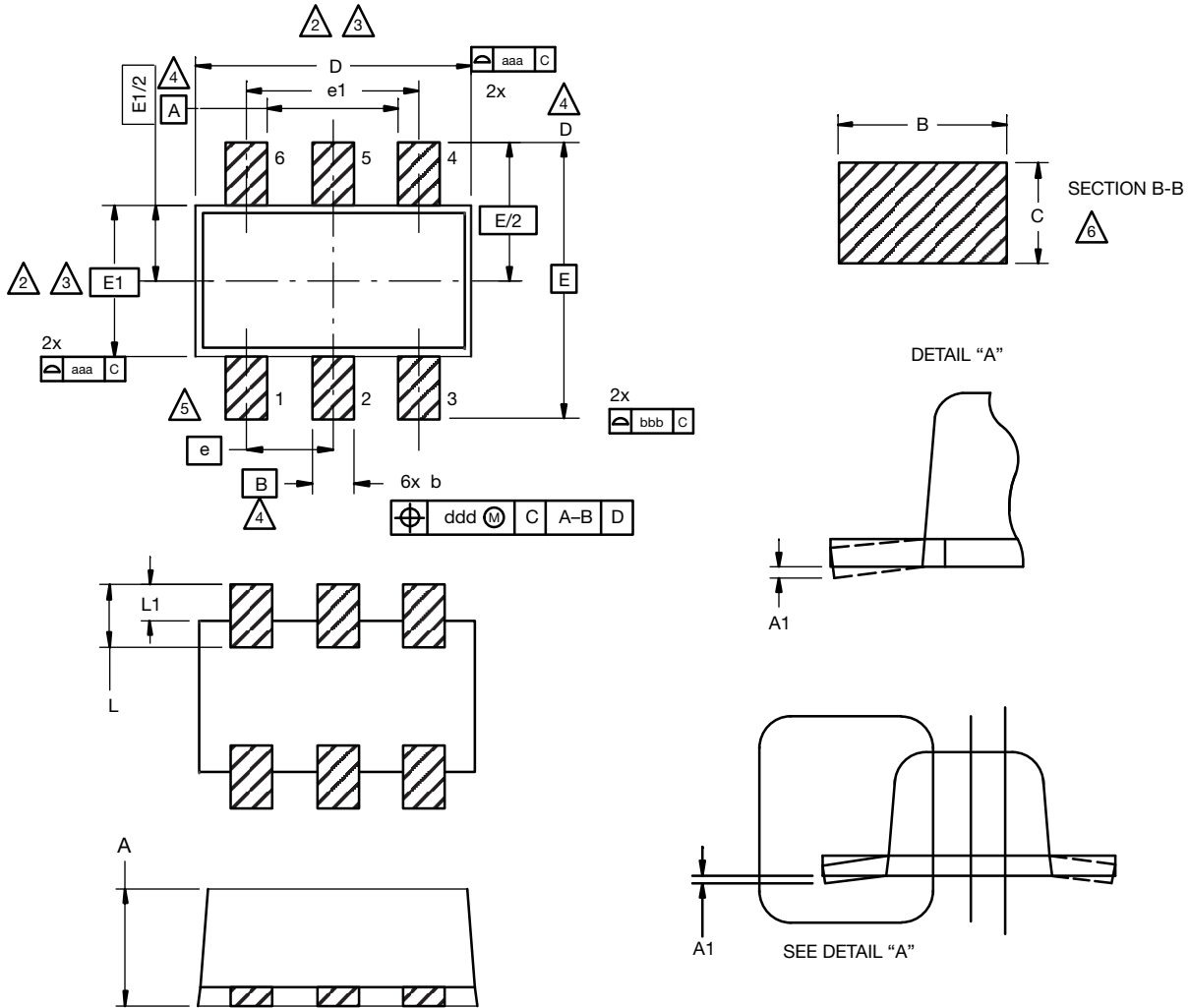
BV_{GSS} vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

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?71427.

SC-89 6-Leads (SOT-563F)



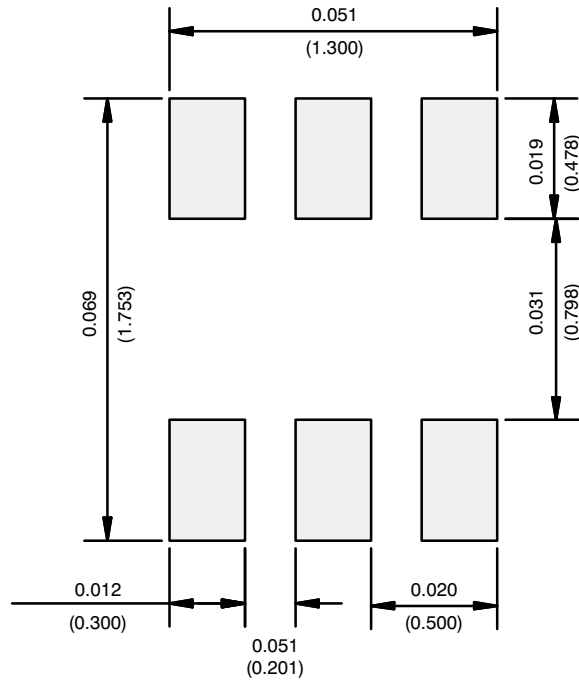
Notes

- Dimensions in millimeters.
- Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15 mm per dimension E1 does not include interlead flash or protrusion, interlead flash or protrusion shall not exceed 0.15 mm per side.
- Dimensions D and E1 are determined at the outmost extremes of the plastic body exclusive of mold flash, the bar burrs, gate burrs and interlead flash, but including any mismatch between the top and the bottom of the plastic body.
- Datums A, B and D to be determined 0.10 mm from the lead tip.
- Terminal numbers 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.

DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.56	0.58	0.60
A1	0	0.02	0.10
b	0.15	0.22	0.30
c	0.10	0.14	0.18
D	1.50	1.60	1.70
E	1.50	1.60	1.70
E1	1.15	1.20	1.25
e	0.45	0.50	0.55
e1	0.95	1.00	1.05
L	0.25	0.35	0.50
L1	0.10	0.20	0.30

C14-0439-Rev. C, 11-Aug-14
DWG: 5880

RECOMMENDED MINIMUM PADS FOR SC-89: 6-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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