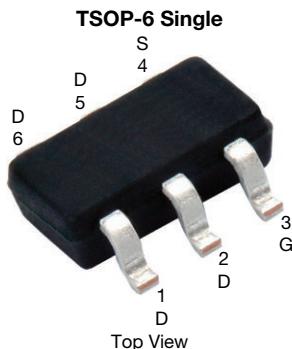
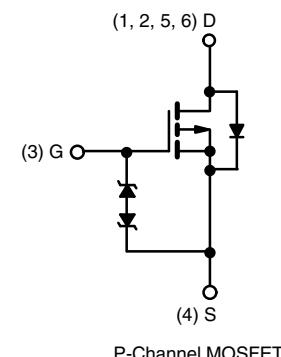


Automotive P-Channel 60 V (D-S) 175 °C MOSFET



FEATURES

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


RoHS
COMPLIANT
HALOGEN
FREE


PRODUCT SUMMARY

V_{DS} (V)	-60
$R_{DS(on)}$ (Ω) at $V_{GS} = -10$ V	0.095
$R_{DS(on)}$ (Ω) at $V_{GS} = -4.5$ V	0.135
I_D (A)	-5.3
Configuration	Single
Package	TSOP-6

Marking Code: 9K

ORDERING INFORMATION

Package	TSOP-6
Lead (Pb)-free and halogen-free	SQ3427CEEV (for detailed order number please see www.vishay.com/doc?79771)

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}	± 20	
Continuous Drain Current	I_D	-5.3	A
		-3	
Continuous Source Current (Diode Conduction)	I_S	-6.3	
Pulsed Drain Current ^a	I_{DM}	-21	
Single Pulse Avalanche Current	I_{AS}	-21	mJ
Single Pulse Avalanche Energy	E_{AS}	22	
Maximum Power Dissipation	P_D	5	W
		1.6	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	R_{thJA}	110	°C/W
Junction-to-Foot (Drain)	R_{thJF}	30	

Notes

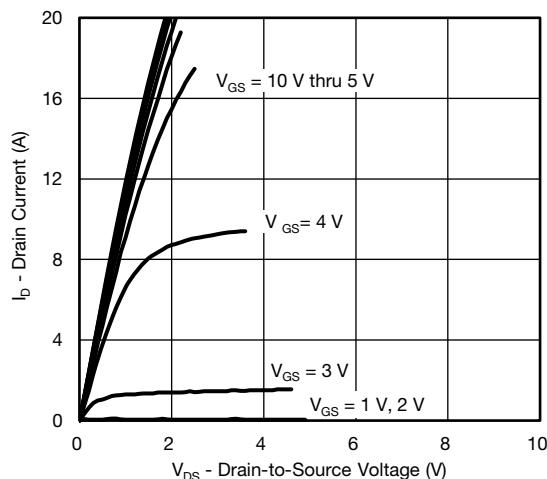
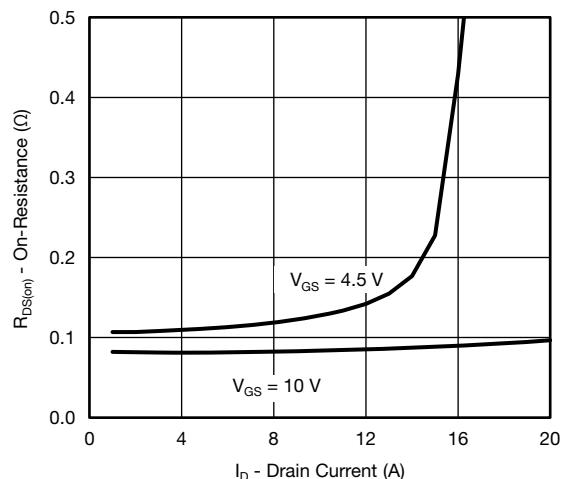
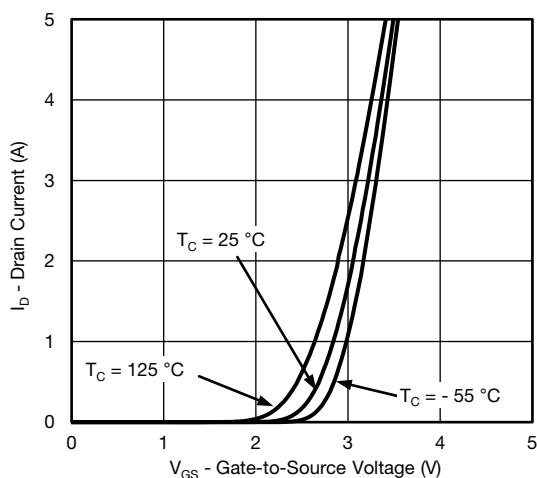
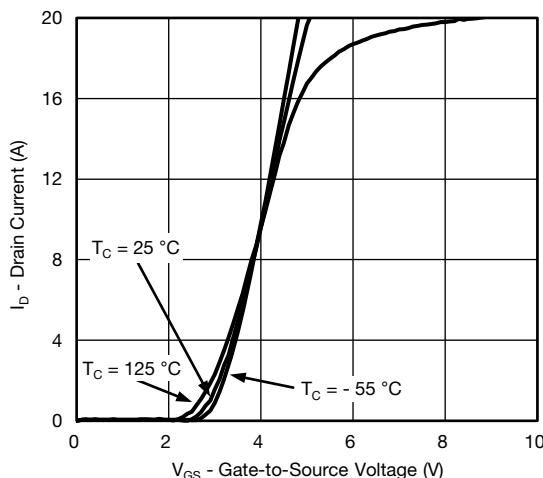
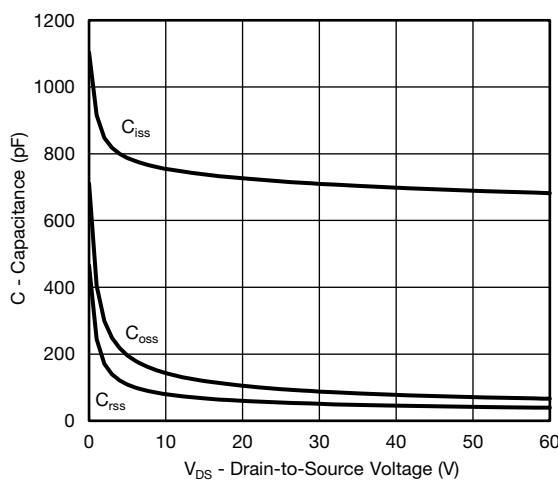
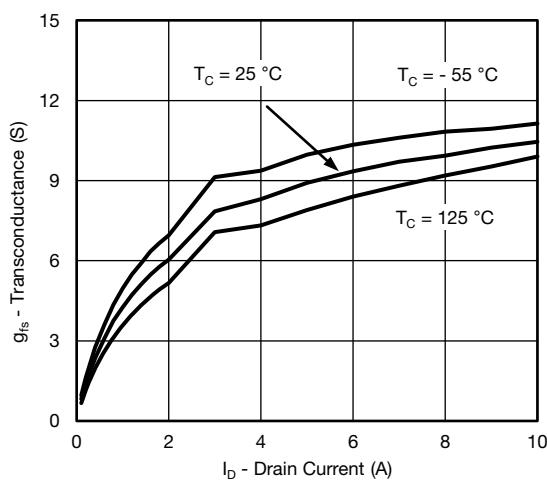
- a. Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
- b. When mounted on 1" square PCB (FR4 material)

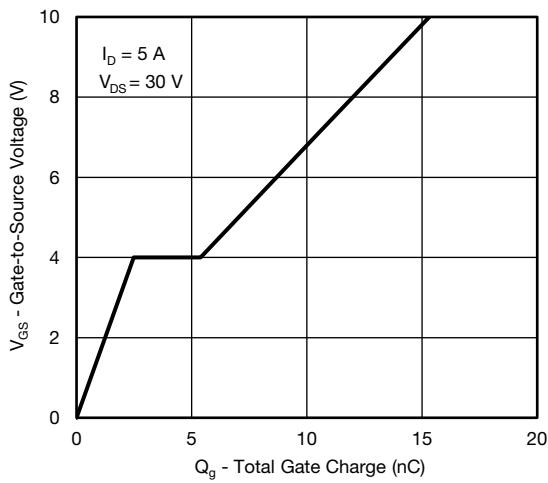
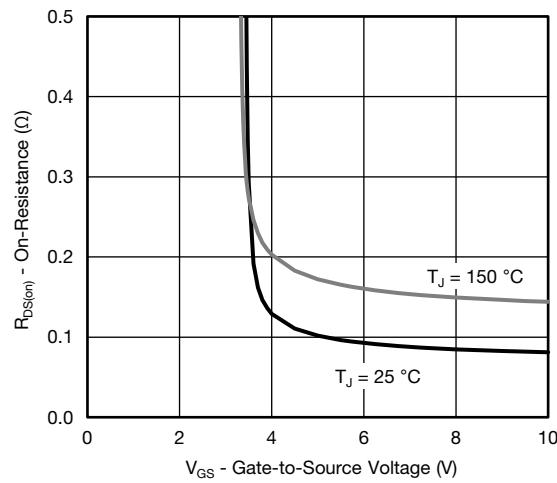
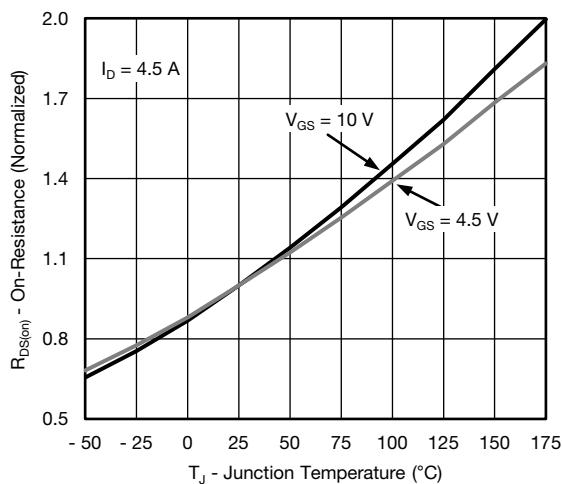
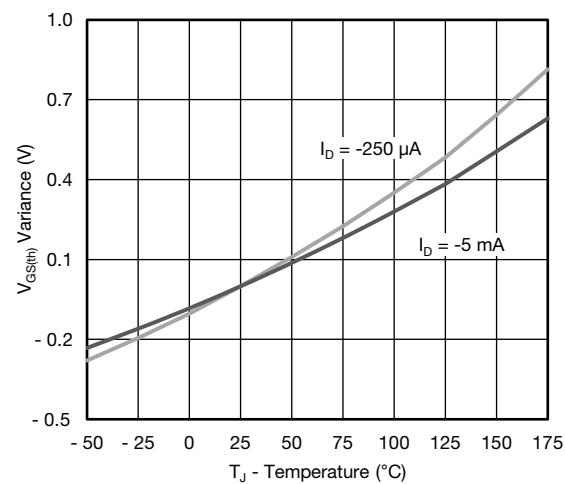
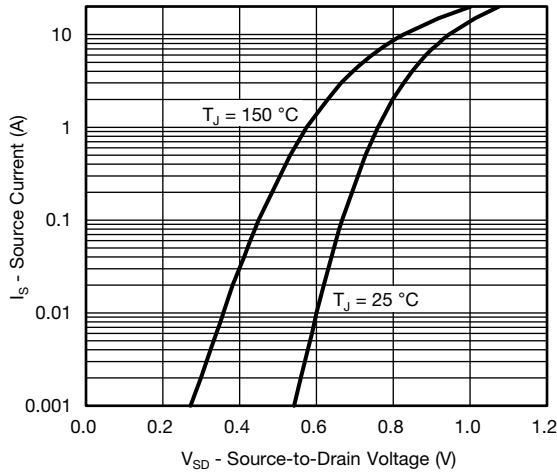
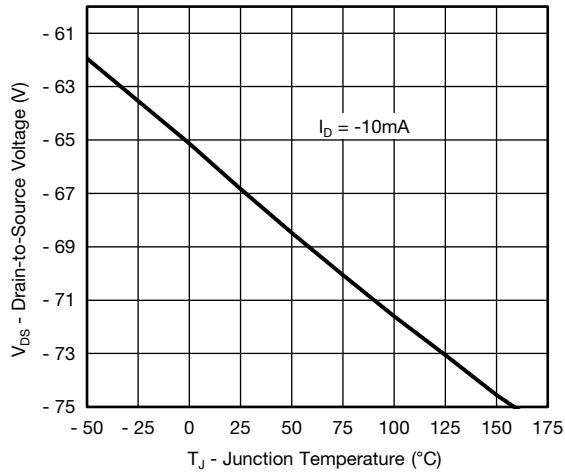
SPECIFICATIONS ($T_C = 25^\circ\text{C}$, unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0$, $I_D = -250 \mu\text{A}$		-60	-	-	V	
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$		-1.5	-2	-2.5		
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$		-		± 10	mA	
		$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 10 \text{ V}$		-	-	± 2		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$	-	-	-1	μA	
		$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$, $T_J = 125^\circ\text{C}$	-	-	-50		
		$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$, $T_J = 175^\circ\text{C}$	-	-	-150		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{GS} = -10 \text{ V}$	$V_{DS} \leq -5 \text{ V}$	-10	-	-	A	
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}$	$I_D = -4.5 \text{ A}$	-	0.079	0.095	Ω	
		$V_{GS} = -10 \text{ V}$	$I_D = -4.5 \text{ A}$, $T_J = 125^\circ\text{C}$	-	-	0.148		
		$V_{GS} = -10 \text{ V}$	$I_D = -4.5 \text{ A}$, $T_J = 175^\circ\text{C}$	-	-	0.178		
		$V_{GS} = -4.5 \text{ V}$	$I_D = -3.5 \text{ A}$	-	0.112	0.135		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 \text{ V}$, $I_D = -4 \text{ A}$		-	9	-	S	
Dynamic ^b								
Input Capacitance	C_{iss}	$V_{GS} = 0 \text{ V}$	$V_{DS} = -30 \text{ V}$, $f = 1 \text{ MHz}$	-	700	1000	pF	
Output Capacitance	C_{oss}			-	90	120		
Reverse Transfer Capacitance	C_{rss}			-	50	75		
Total Gate Charge ^c	Q_g	$V_{GS} = -10 \text{ V}$	$V_{DS} = -30 \text{ V}$, $I_D = -5 \text{ A}$	-	15.3	22	nC	
Gate-Source Charge ^c	Q_{gs}			-	2.5	-		
Gate-Drain Charge ^c	Q_{gd}			-	5.4	-		
Gate Resistance	R_g	$f = 1 \text{ MHz}$		2.7	5.4	8.1	Ω	
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = -30 \text{ V}$, $R_L = 6 \Omega$ $I_D \approx -5 \text{ A}$, $V_{GEN} = -10 \text{ V}$, $R_g = 1 \Omega$		-	8	12	ns	
Rise Time ^c	t_r			-	24	35		
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			-	26	38		
Fall Time ^c	t_f			-	33	50		
Source-Drain Diode Ratings and Characteristics ^b								
Pulsed Current ^a	I_{SM}			-	-	-21	A	
Forward Voltage	V_{SD}	$I_F = -1.6 \text{ A}$, $V_{GS} = 0 \text{ V}$		-	-0.8	-1.2	V	
Body diode reverse recovery time	t_{rr}	$I_F = -1.7 \text{ A}$, $\text{di/dit} = 100 \text{ A}/\mu\text{s}$		-	24	48	ns	
Body diode reverse recovery charge	Q_{rr}			-	29	58		
Reverse recovery fall time	t_a			-	21	-		
Reverse recovery rise time	t_b			-	3	-		
Body diode peak reverse recovery current	$I_{RM(\text{REC})}$			-	-2.97	-	A	

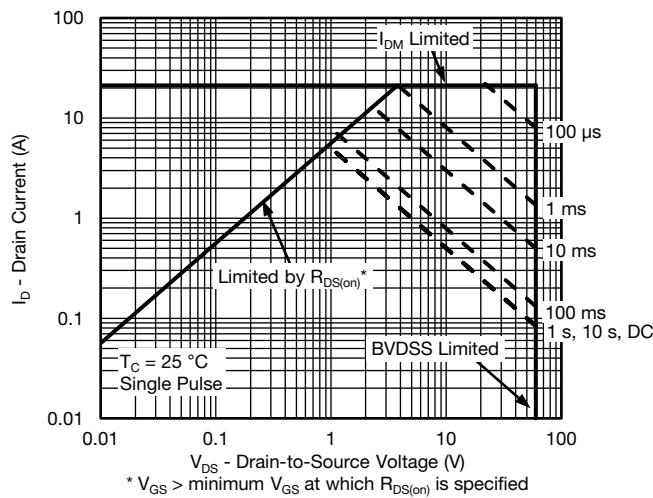
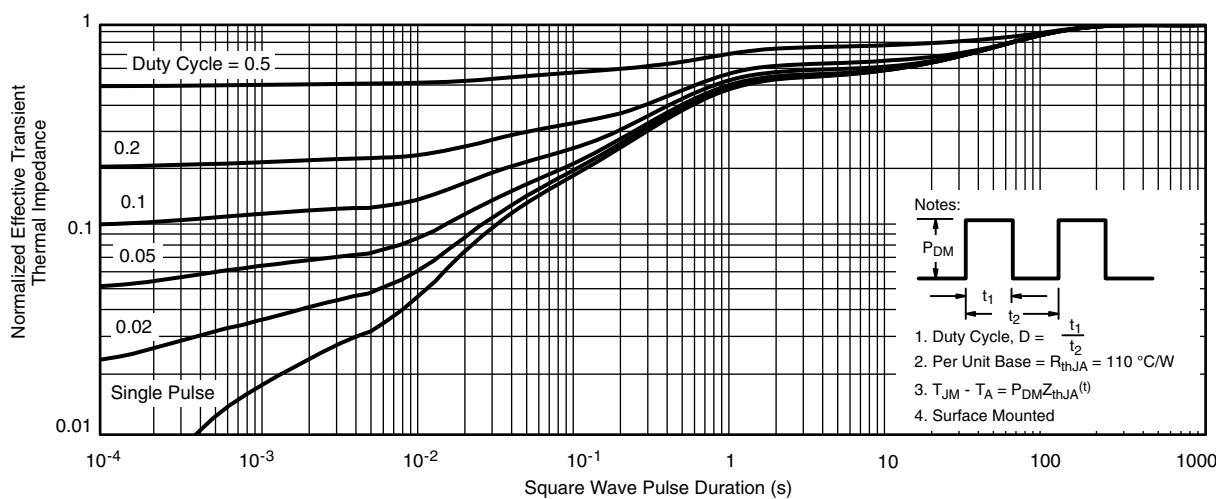
Notes

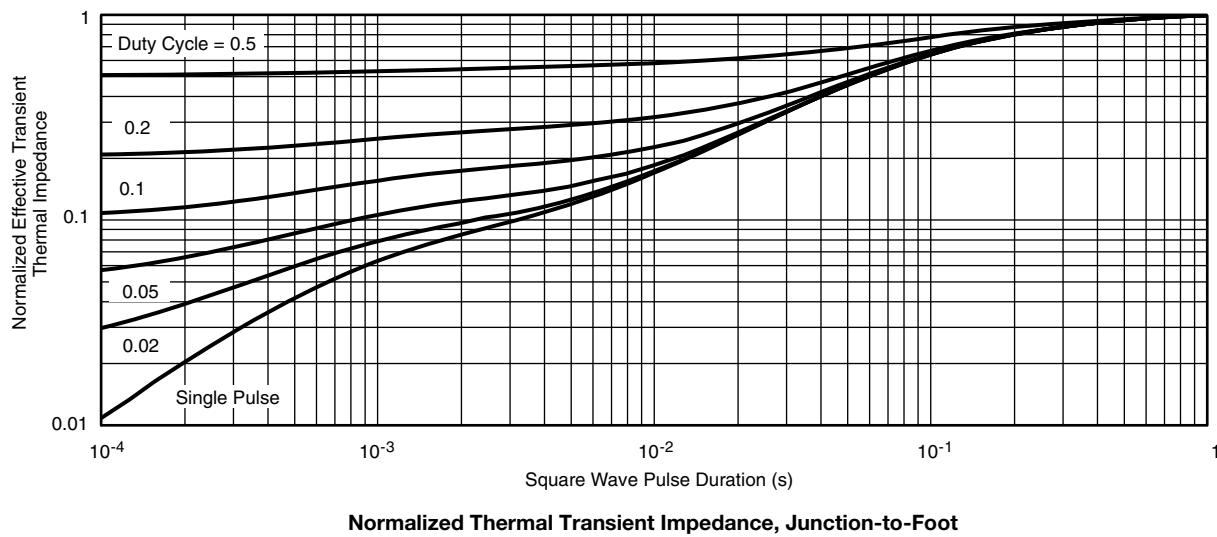
- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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)

Output Characteristics

On-Resistance vs. Drain Current and Gate Voltage

Transfer Characteristics

Transfer Characteristics

Capacitance

Transconductance

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Gate Charge

On-Resistance vs. Gate-to-Source Voltage

On-Resistance vs. Junction Temperature

Threshold Voltage

Source-Drain Diode Forward Voltage

Drain-to-Source Voltage vs. Junction Temperature

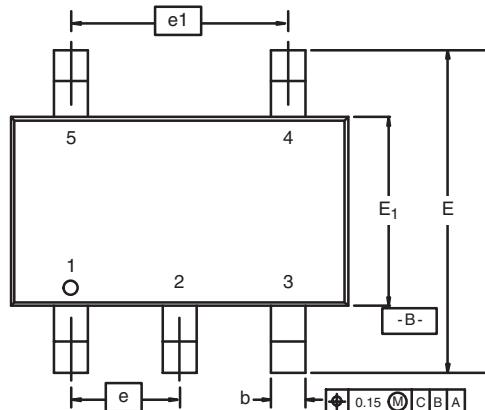
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Safe Operating Area, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


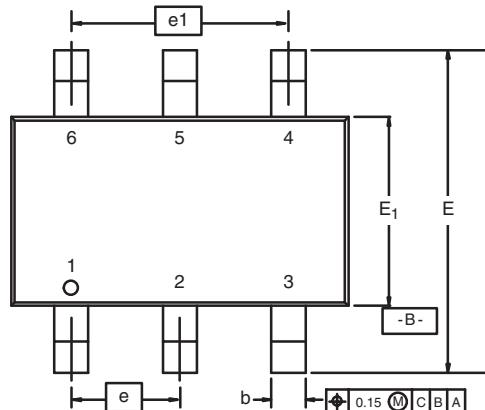
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TSOP: 5/6-LEAD

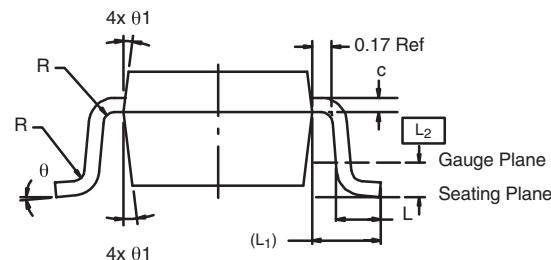
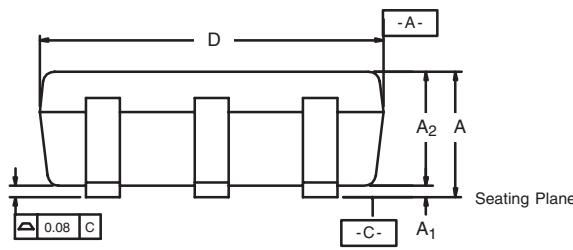
JEDEC Part Number: MO-193C



5-LEAD TSOP



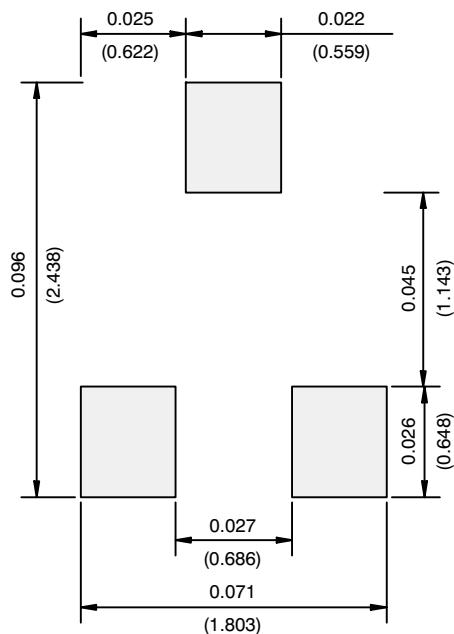
6-LEAD TSOP



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A₁	0.01	-	0.10	0.0004	-	0.004
A₂	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E₁	1.55	1.65	1.70	0.061	0.065	0.067
e	0.95 BSC			0.0374 BSC		
e₁	1.80	1.90	2.00	0.071	0.075	0.079
L	0.32	-	0.50	0.012	-	0.020
L₁	0.60 Ref			0.024 Ref		
L₂	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ₁	7° Nom			7° Nom		

ECN: C-06593-Rev. I, 18-Dec-06

DWG: 5540

RECOMMENDED MINIMUM PADS FOR SC-70: 3-Lead

Recommended Minimum Pads
Dimensions in Inches/(mm)

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