

## N-Channel 16 -V (D-S) MOSFET

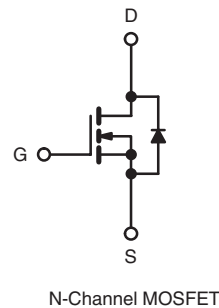
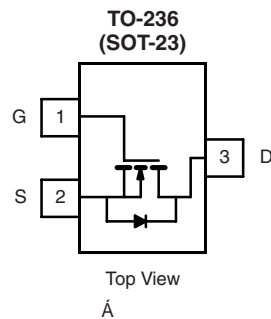
PRODUCT SUMMARY				
V <sub>(BR)DSS</sub> Min (V)	r <sub>DS(on)</sub> Max (Ω)	V <sub>GS(th)</sub> (V)	I <sub>D</sub> (A)	
			DTS03K16	DTS03K16A
16	1.0 @ V <sub>GS</sub> = 10 V	1.0 to 3.0	0.42	0.64
	1.4 @ V <sub>GS</sub> = 4.5 V		0.35	0.53

### FEATURES

- TrenchFET® Power MOSFET

### APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	Limit		Unit
		DTS03K16	DTS03K16A	
Drain-Source Voltage	V <sub>DS</sub>	16		V
Gate-Source Voltage	V <sub>GS</sub>	± 8		
Continuous Drain Current (T <sub>J</sub> = 150 °C)	T <sub>A</sub> = 25 °C	0.42	0.64	A
	T <sub>A</sub> = 70 °C	0.33	0.51	
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	0.8	1.5	
Power Dissipation	T <sub>A</sub> = 25 °C	0.35	0.8	W
	T <sub>A</sub> = 70 °C	0.22	0.51	
Thermal Resistance, Junction-to-Ambient	R <sub>thJA</sub>	357	156	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

Notes

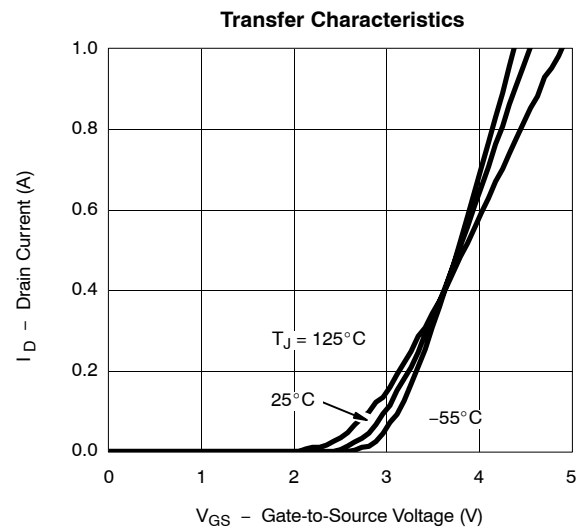
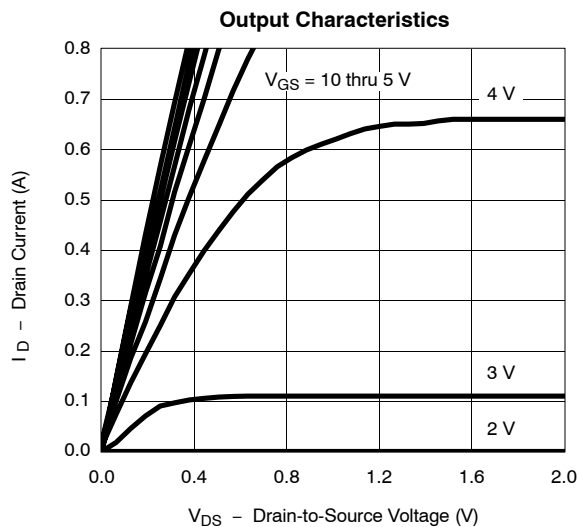
a. Pulse width limited by maximum junction temperature.

SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 10 μA	16			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 0.25 mA	1.0	2.0	3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 8 V <sup>c</sup>	DTS03K16	0.5		A
			DTS03K16A	0.8		
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.1 A		0.8	1.4	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.3 A		0.47	1.0	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.3 A		550		mS
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 0.3 A, V <sub>GS</sub> = 0 V		0.85	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 10 V I <sub>D</sub> ≅ 0.3 A		1000	1500	pC
Gate-Source Charge	Q <sub>gs</sub>			205		
Gate-Drain Charge	Q <sub>gd</sub>			200		
Gate Resistance	R <sub>g</sub>			48		Ω
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 50 Ω I <sub>D</sub> ≅ 0.3 A, V <sub>GEN</sub> = 10 V R <sub>G</sub> = 6 Ω		4.5	8	ns
	t <sub>r</sub>			8	15	
Turn-Off Time	t <sub>d(off)</sub>			9	15	
	t <sub>f</sub>			6.3	12	

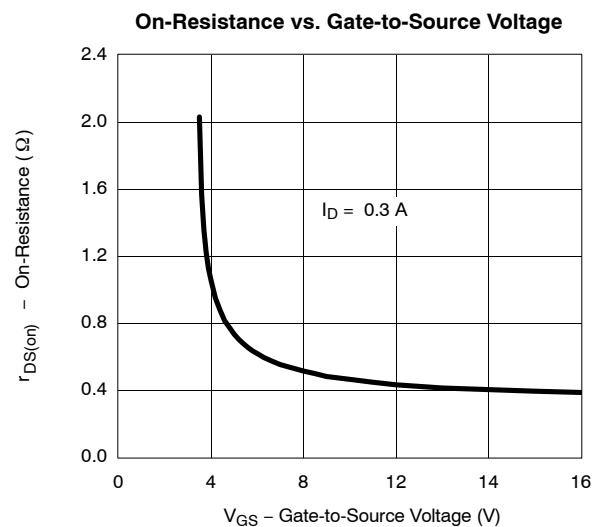
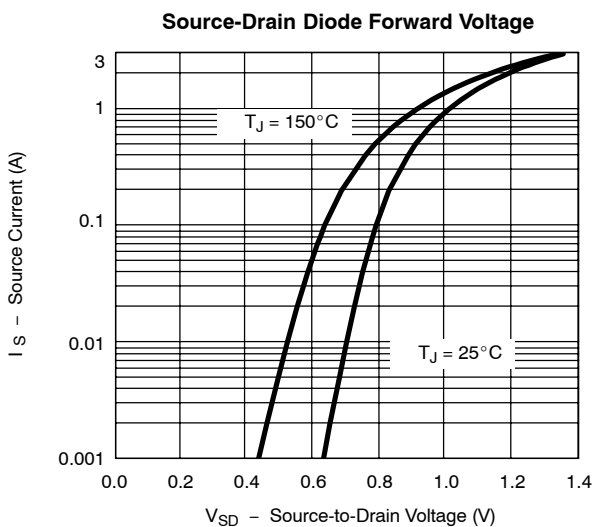
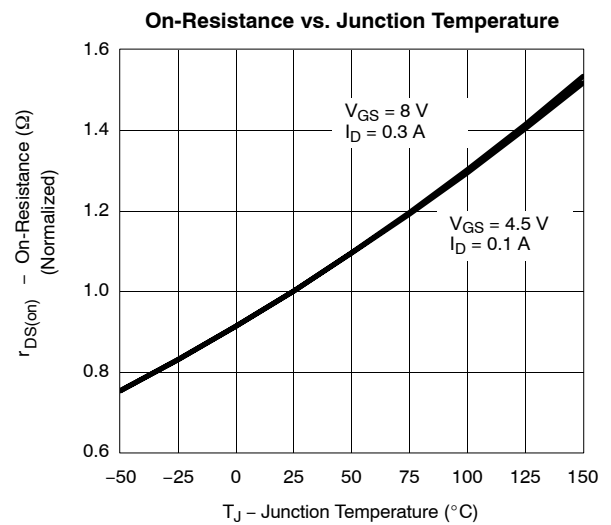
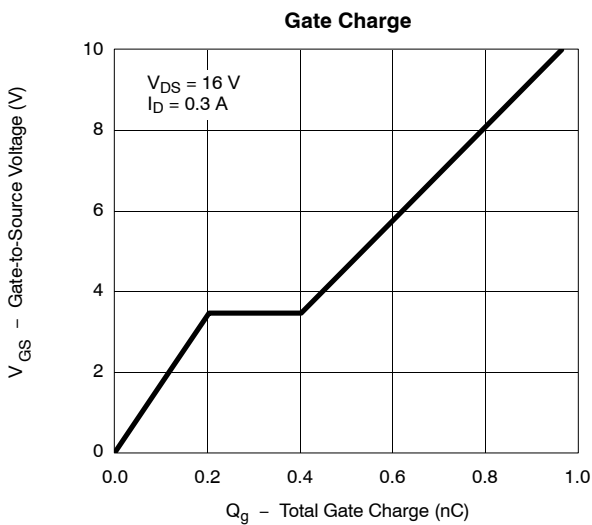
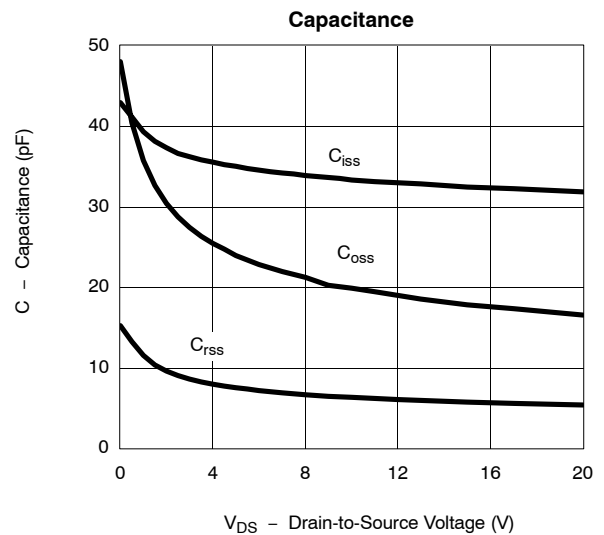
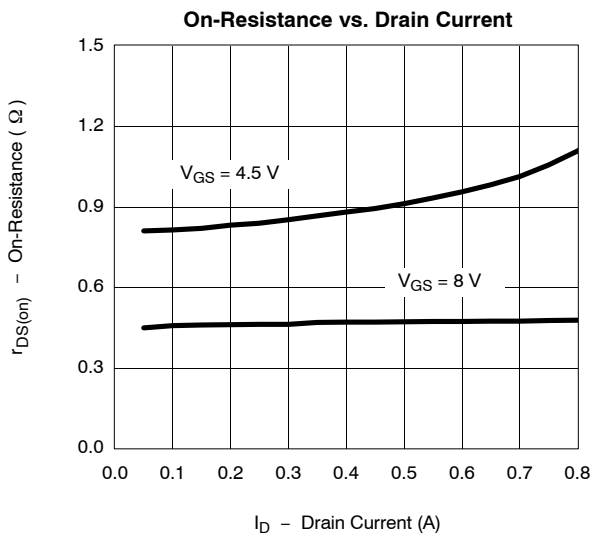
**Notes**

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

## TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

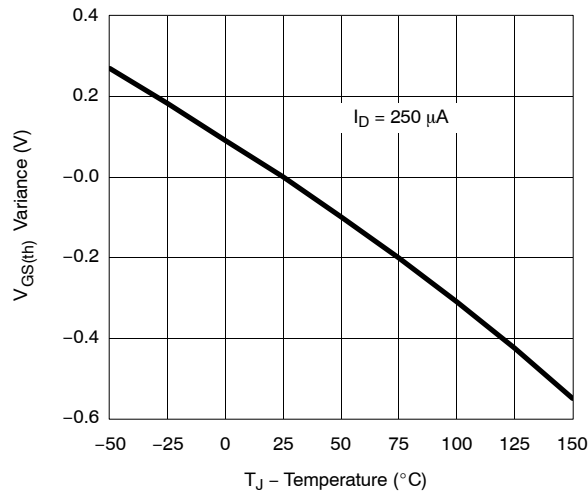


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

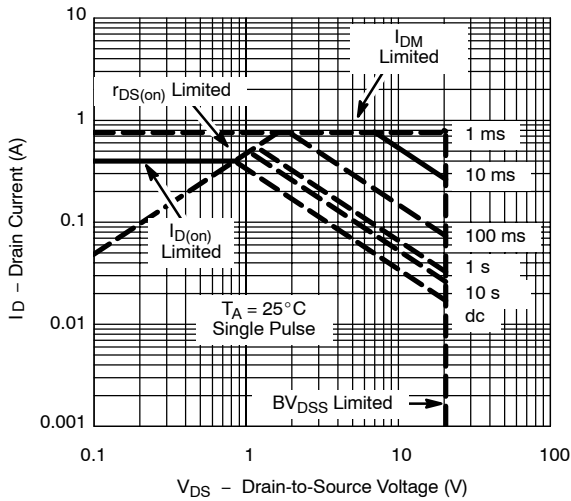


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

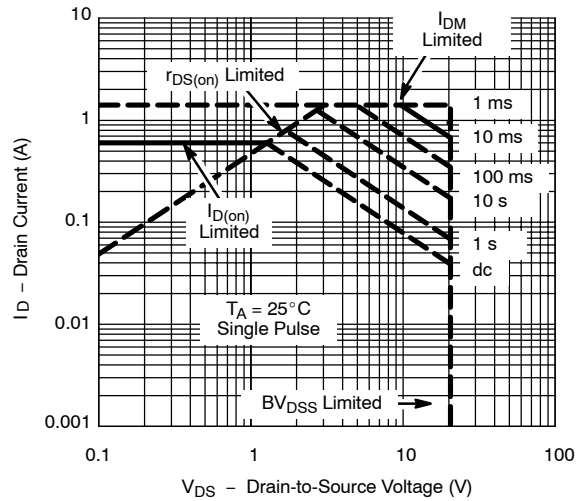
**Threshold Voltage**



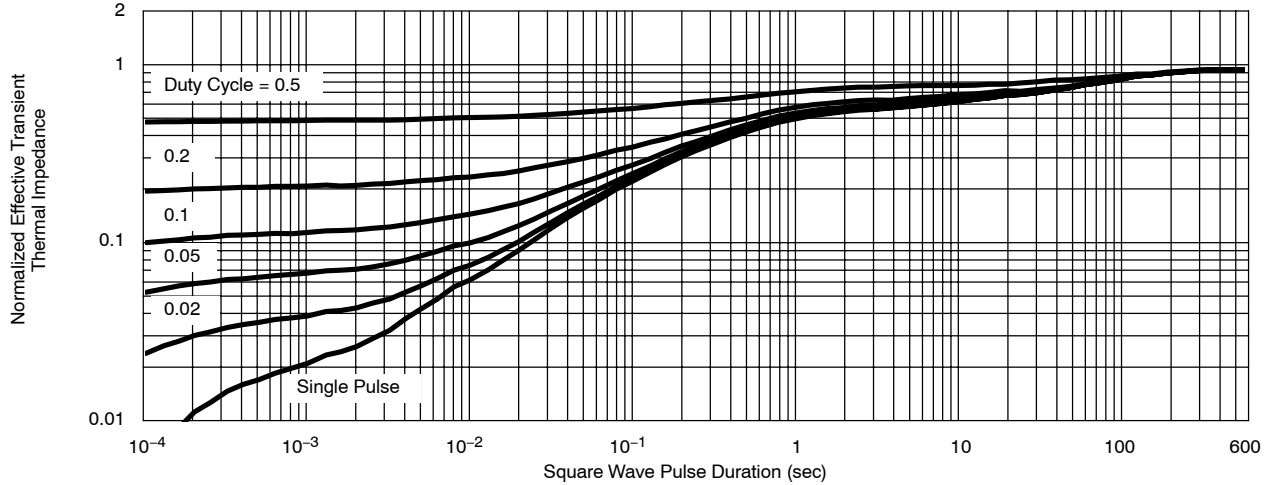
**Safe Operating Area (TO-236, DTS03K16 Only)**



**Safe Operating Area (TO-226AA, DTS03K16A Only)**

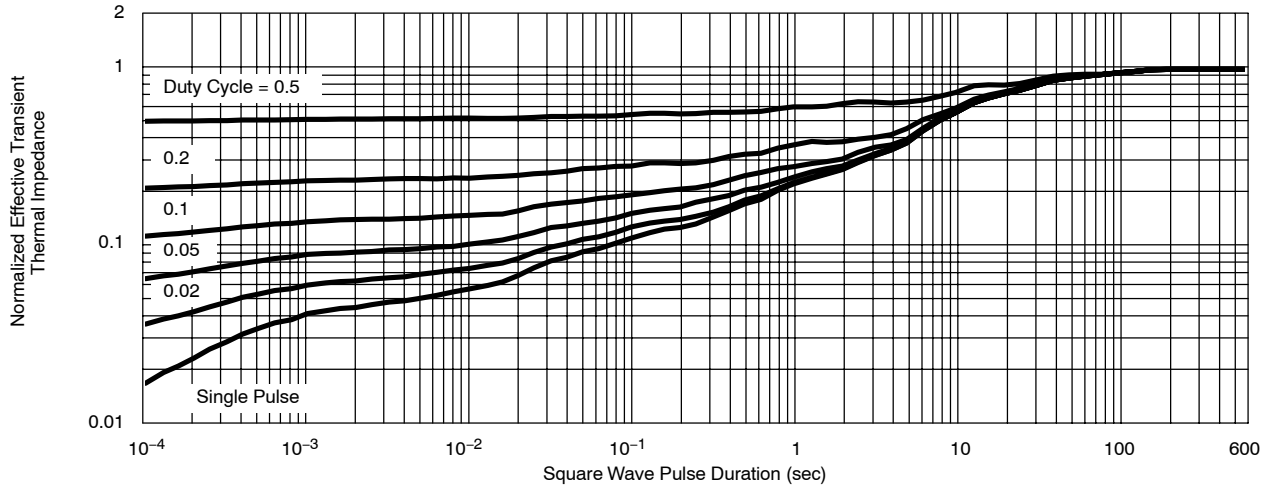


**Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, DTS03K16 Only)**

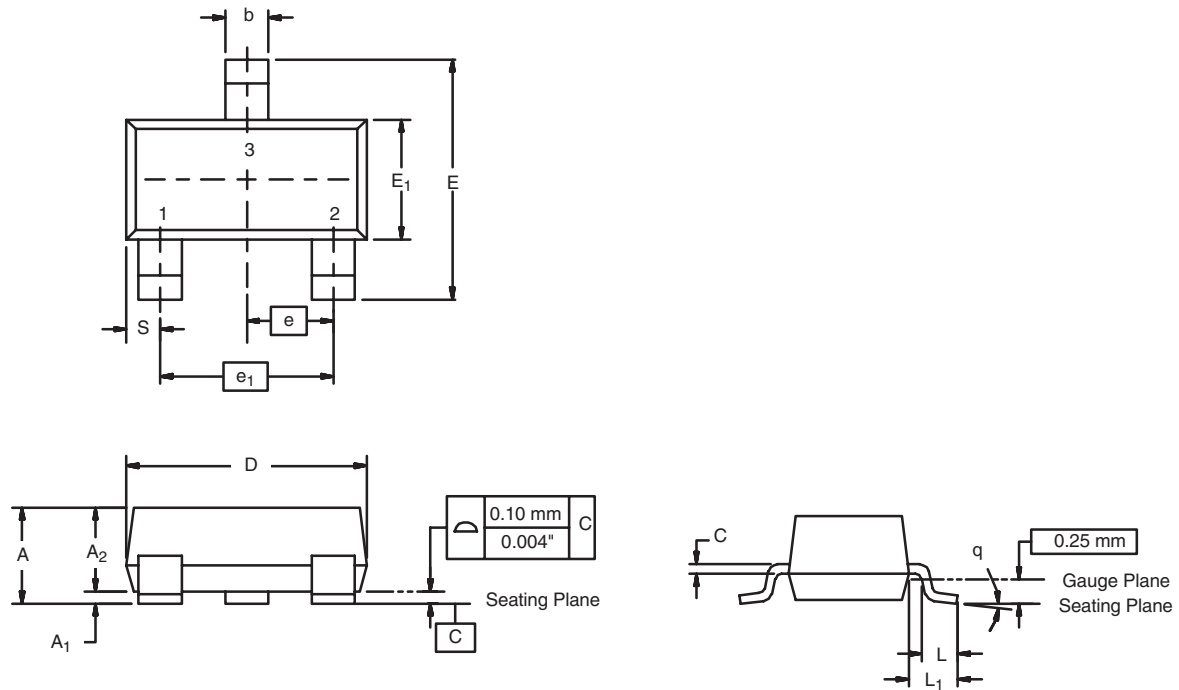


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-226AA, DTS03K16A Only)



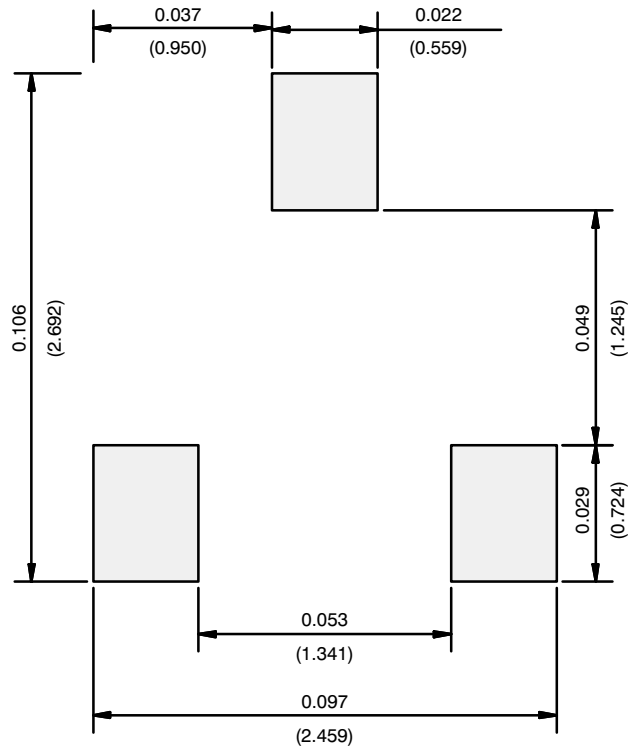
## SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A <sub>1</sub>	0.01	0.10	0.0004	0.004
A <sub>2</sub>	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E <sub>1</sub>	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e <sub>1</sub>	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L <sub>1</sub>	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

ECN: S-03946-Rev. K, 09-Jul-01  
 DWG: 5479

## RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads  
Dimensions in Inches/(mm)

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