

Off-Line, High Voltage EL Lamp Driver

Features

- ▶ Processed with HVCMOS® technology
- ▶ Input voltage up to 200V DC
- ▶ 400V peak-to-peak output voltage
- ▶ Output load up to 350nF (100 in² for 3.5nF/in² lamp)
- ▶ Adjustable output lamp frequency
- ▶ Adjustable on/off pulsing frequency

Applications

- ▶ Electronic organizers
- ▶ Handheld portable computers
- ▶ Display signs
- ▶ Portable instrumentation equipment

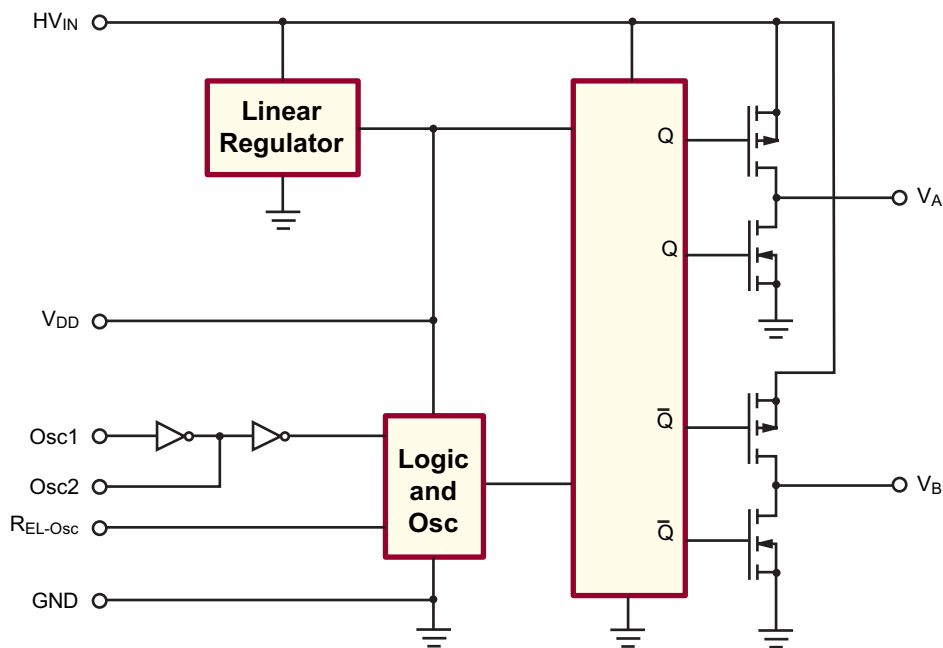
General Description

The Supertex HV809 is an off-line, high voltage, EL lamp driver integrated circuit designed for driving EL lamps of up to 350nF at 400Hz. The input supply voltage can be a rectified nominal 120VAC source or any other DC source up to 200V. The HV809 will supply the EL lamp with an AC square wave with a peak-to-peak voltage of two times the input DC voltage.

The HV809 has two internal oscillators, a low voltage output linear regulator, and a high voltage output H-bridge. The high voltage output H-bridge frequency is set by an external resistor connected between the R_{EL-Osc} and GND pins. The EL lamp is connected between pins V_A and V_B. For the HV809 in the 8-pin package, an external RC network can be connected between the oscillator's Osc1 and Osc2 pins to pulse the EL lamp on and off.

For detailed circuit and application information please refer to Application Note AN-H36.

Block Diagram



Ordering Information

Device	Package Options		
	8-Lead SO	8-Lead SO + Slug	7-Lead TO-220
HV809	HV809LG-G	HV809SG-G	HV809K2-G



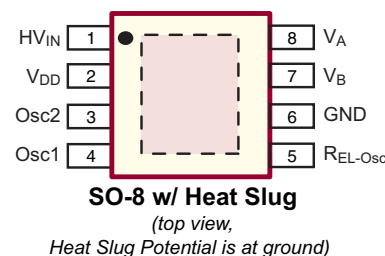
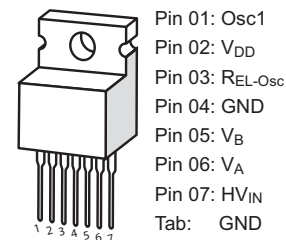
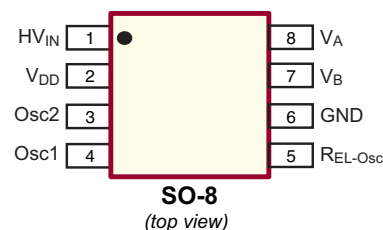
-G indicates package is RoHS compliant ('Green')

Absolute Maximum Ratings

Parameter	Value
HV_{IN} , Input voltage	+210V
V_{DD} , Internal logic voltage	+15V
Operating temperature Range	-25°C to +85°C
Storage temperature Range	-55°C to +150°C
Power dissipation:	
SO-8	500mW
SO-8 + Slug	1.5 Watts
7-Lead TO-220	15Watts

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Pin Configurations



Electrical Characteristics

DC Characteristics (Over recommended operating conditions unless otherwise specified - $T_A = 25^\circ\text{C}$)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I_{IN}	High voltage supply current	-	-	70	mA	$HV_{IN} = 170\text{V}$, $R_{EL} = 1.0\text{M}\Omega$, $C_L = 350\text{nF}$
		-	-	9.0	mA	$HV_{IN} = 170\text{V}$, $R_{EL} = 1.0\text{M}\Omega$, $C_L = 50\text{nF}$
I_{INQ}	Quiescent supply current	-	-	400	μA	$HV_{IN} = 170\text{V}$, $R_{EL-Osc} = 1.0\text{M}\Omega$, Osc1 = GND, No Load
		-	-	100	μA	$HV_{IN} = 170\text{V}$, $R_{EL-osc} = 1.0\text{M}\Omega$, Osc1 = V_{DD} , No Load
I_{SINK}	Osc2 sink current	-	300	-	μA	$V_{Osc2} = 1.0\text{V}$
I_{SOURCE}	Osc2 source current	-	100	-	μA	$V_{Osc2} = V_{DD} - 1.0\text{V}$
I_{Osc1}	Osc1 logic input leakage current	-	± 10	-	μA	$V_{Osc1} = 0\text{V}$ and V_{DD}
V_H	Osc1 hysteresis voltage	-	2.5	-	V	---
V_{A-B}	Min differential output voltage across lamp	-	-	400	V	$HV_{IN} = 200\text{V}$
V_{DD}	Internal supply voltage	8.0	10	12	V	No load on V_{DD}
$I_{DD(OUT)}$	Minimum output V_{DD} current	-	-	4.0	mA	For HV809K2, $\Delta V_{DD} = 1.0\text{V}$

Electrical Characteristics

AC Characteristics (Over recommended operating conditions unless otherwise specified - $T_A = 25^\circ\text{C}$)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
f_{EL}	V_{A-B} output drive frequency	320	400	480	Hz	$R_{EL-Osc} = 1.0\text{M}\Omega$, Osc1 = GND, $C_L = 350\text{nF}$
		0.8	1.0	1.2	kHz	$R_{EL-Osc} = 390\text{K}\Omega$, Osc1 = GND, $C_L = 150\text{nF}$
t_r	Output rise time	-	180	250	μs	$C_L = 150\text{nF}$, $HV_{IN} = 170\text{V}$
t_f	Output fall time	-	50	100	μs	$C_L = 150\text{nF}$, $HV_{IN} = 170\text{V}$

Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units	Conditions
HV_{IN}	High voltage input	50	-	200	V	---
C_L	Load capacitance	-	-	350	nF	$R_{EL-Osc} = 1.0\text{M}\Omega$, $HV_{IN} = 170\text{V}$
		-	-	150	nF	$R_{EL-Osc} = 390\text{K}\Omega$, $HV_{IN} = 170\text{V}$
T_A	Operating temperature	-25	-	85	$^\circ\text{C}$	---

Function Table

Input	Outputs	
Osc1	V_A	V_B
GND	Enabled	Enabled
V_{DD}	Disabled	Disabled

Figure 1. AC Off-Line EL Lamp

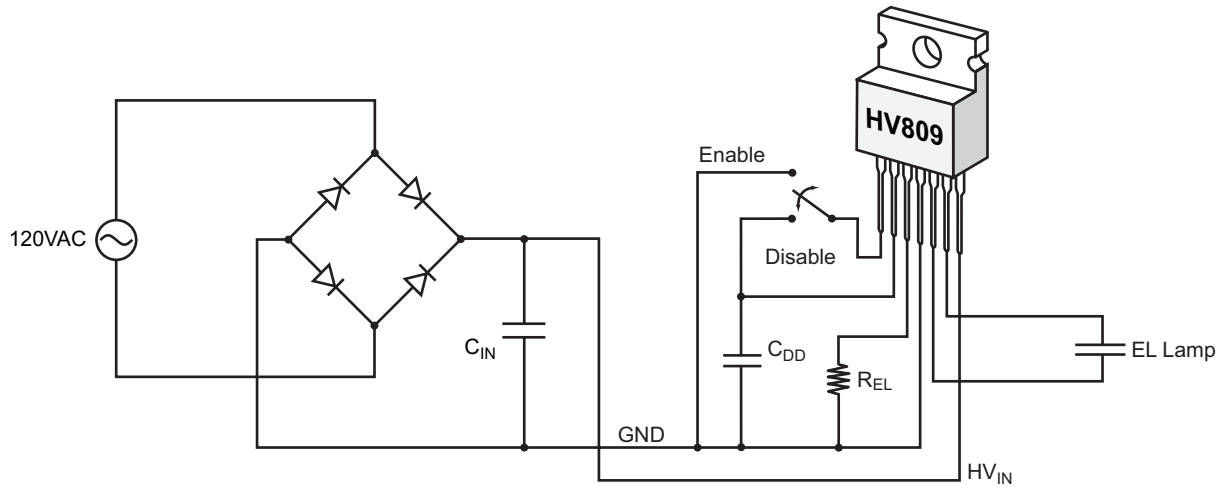


Figure 2. Pulsing EL Lamp

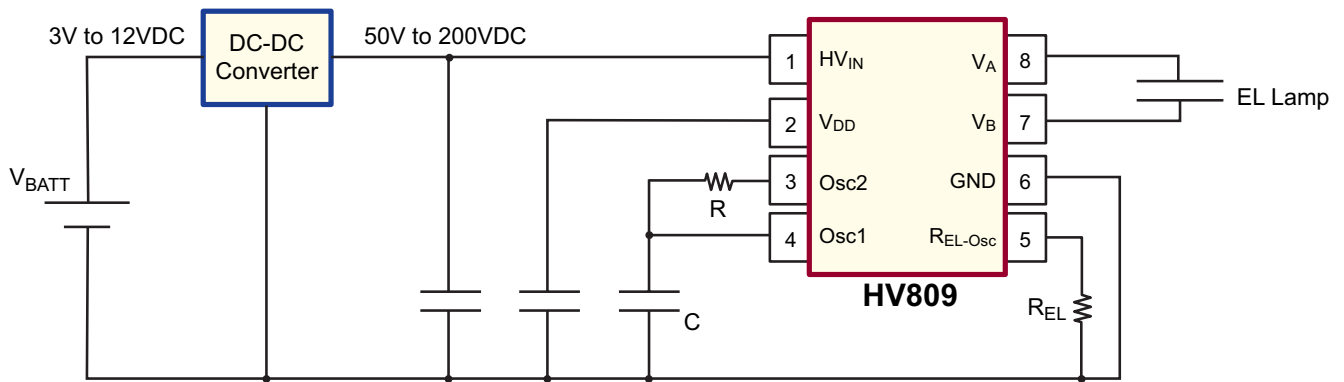
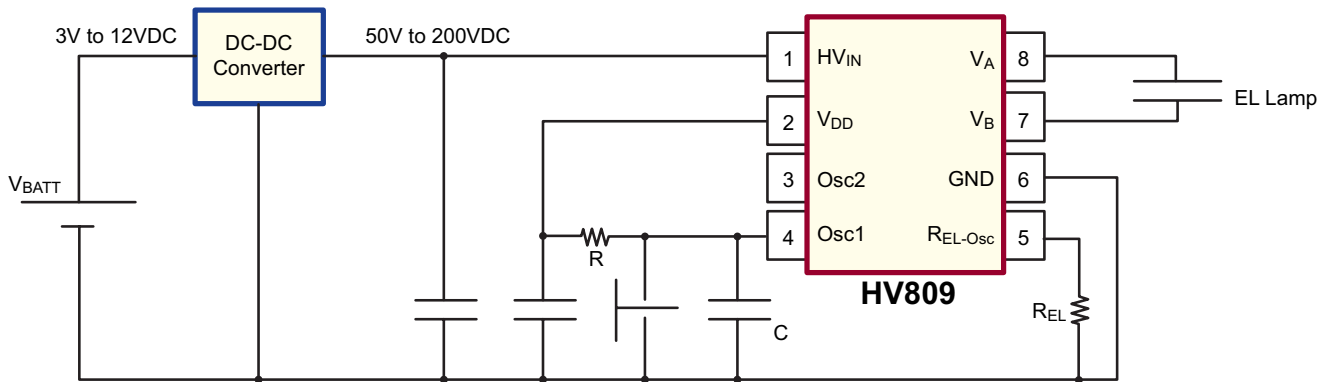
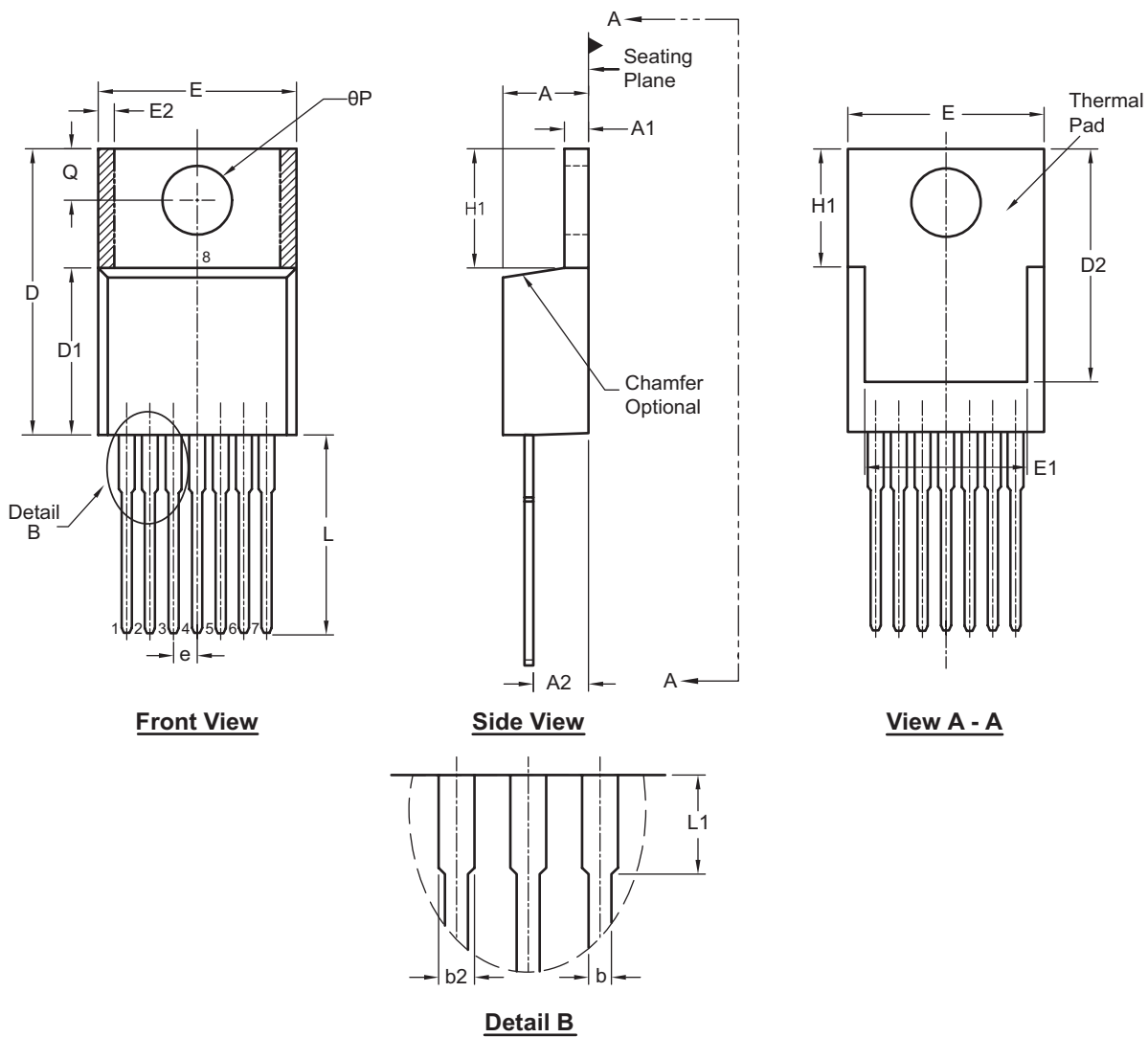


Figure 3. Push-Button, Delayed Turn Off



7-Lead TO-220 Package Outline (K2)

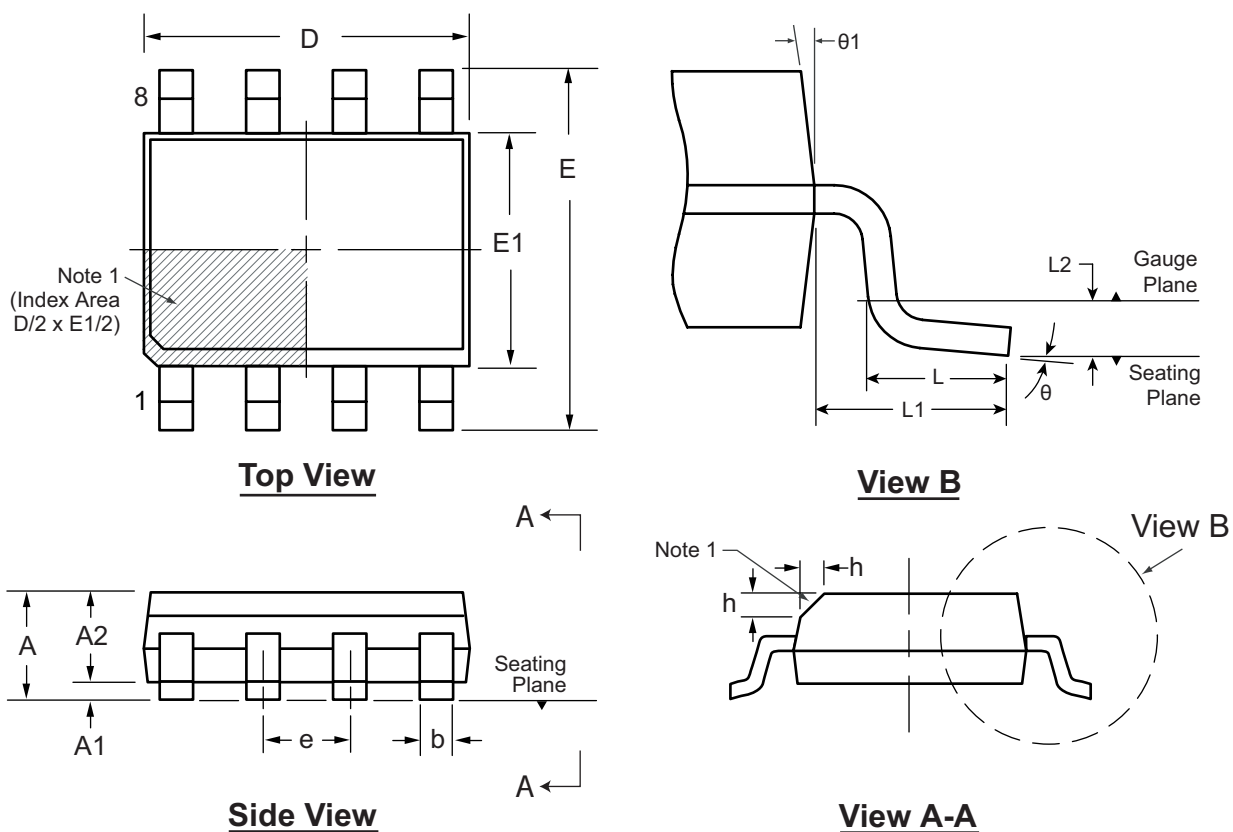


Symbol	A	A1	A2	b	b2	D	D1	D2	E	E1	E2	e	H1	L	L1	Q	θP
Dimension (inches)	MIN	.140	.020	.080	.015	.045	.560	.330	.480	.380	.270	-	.230	.500	-	.100	.139
	NOM	-	-	-	.027	.057	-	-	-	-	-	.100 BSC	-	-	-	-	-
	MAX	.190	.055	.115	.040	.070	.650	.355	.507	.420	.350	.030	.270	.580	.250	.135	.161

JEDEC Registration TO-220, Variation AB, Issue K, April 2002.
 Drawings not to scale.

8-Lead SOIC (Narrow Body) Package Outline (LG/TG)

4.9x3.9mm body, 1.75mm height (max), 1.27mm pitch



Note 1:

This chamfer feature is optional. If it is not present, then a Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier may be either a mold, or an embedded metal or marked feature.

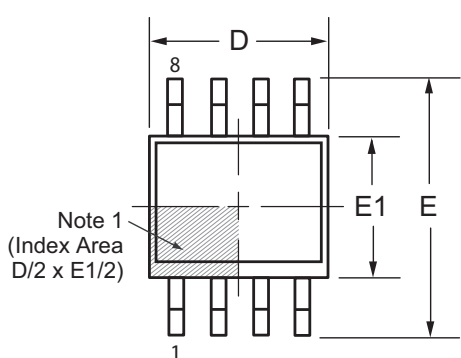
Symbol		A	A1	A2	b	D	E	E1	e	h	L	L1	L2	θ	$\theta 1$
Dimension (mm)	MIN	1.35	0.10	1.25	0.31	4.80	5.80	3.80	1.27 BSC	0.25	0.40	1.04 REF	0.25 BSC	0°	5°
	NOM	-	-	-	-	4.90	6.00	3.90		-	-			-	-
	MAX	1.75	0.25	1.50	0.51	5.00	6.20	4.00		0.50	1.27			8°	15°

JEDEC Registration MS-012, Variation AA, Issue E, Sept. 2005.

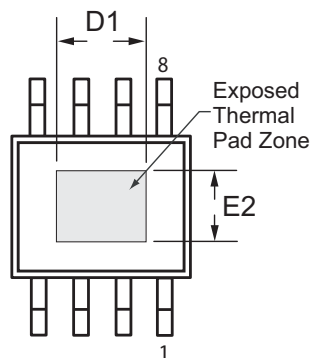
Drawings not to scale.

8-Lead SOIC (Narrow Body w/Heat Slug) Package Outline (SG)

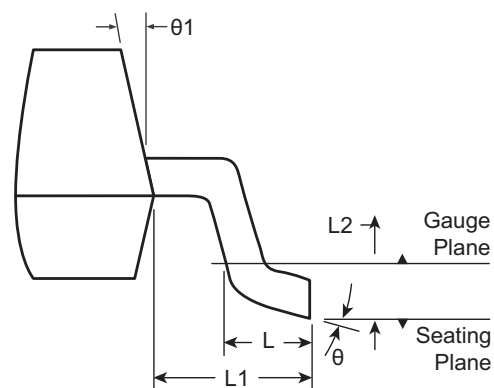
4.90x3.90mm body, 1.70mm height (max), 1.27mm pitch



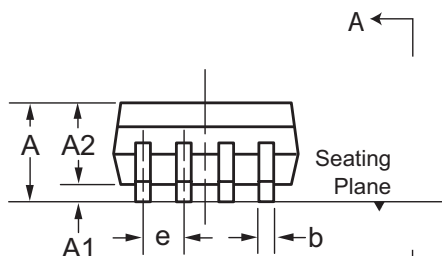
Top View



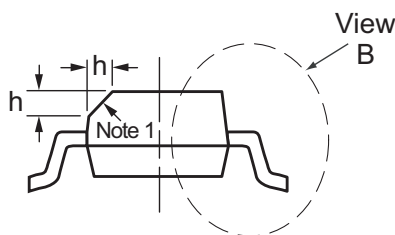
Bottom View



View B



Side View



View A-A

Note 1:

This chamfer feature is optional. If it is not present, then a Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier may be either a mold, or an embedded metal or marked feature.

Symbol	A	A1	A2	b	D	D1	E	E1	E2	e	h	L	L1	L2	θ	θ1			
Dimension (mm)	MIN	1.25	0.00	1.25	0.31	4.80	3.30*	5.80	3.80	2.29*	1.27 BSC	0.25	0.40	1.04 REF	0.25 BSC	0°	5°		
	NOM	-	-	-	-	4.90	-	6.00	3.90	-		-	-		-	-	-	-	-
	MAX	1.70	0.15	1.70	0.51	5.00	3.81*	6.20	4.00	2.79*		0.50	1.27		-	-	8°	15°	

JEDEC Registration MS-012, Variation BA, Issue E, Sept. 2005.

Dimensions marked with (*) are non-JEDEC dimensions.

Drawings not to scale.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

Supertex inc. does not recommend the use of its products in life support applications, and will not knowingly sell its products for use in such applications, unless it receives an adequate "product liability indemnification insurance agreement". Supertex does not assume responsibility for use of devices described and limits its liability to the replacement of the devices determined defective due to workmanship. No responsibility is assumed for possible omissions or inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications, refer to the Supertex website: <http://www.supertex.com>.