

Simple 90V 20mA Temperature Compensated Constant Current LED Driver IC

Features

- ❑ 5.0V to 90V operating range (V_{A-B})
- ❑ $20\text{mA} \pm 10\%$ at 5-90V
- ❑ $0.01\% / ^\circ\text{C}$ Typical Temperature Coefficient
- ❑ TO-243AA (SOT-89), TO-252 (D-PAK), & TO-92 packages
- ❑ No external components (two terminal device)
- ❑ Can be paralleled for higher current

Applications

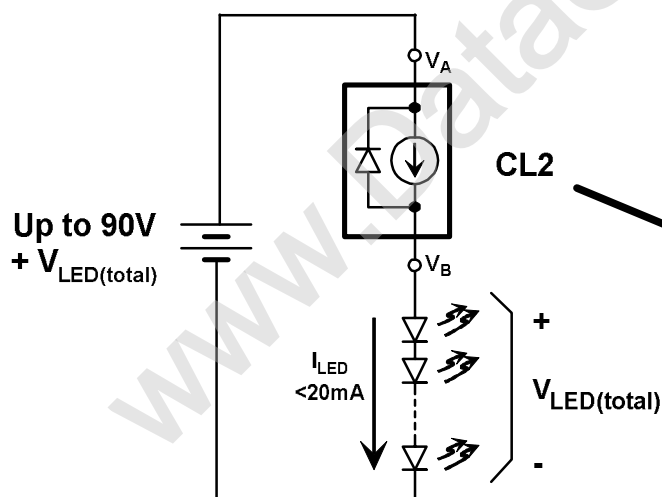
- ❑ LED driver
- ❑ Industrial lamp indicators
- ❑ Signage
- ❑ Accent lighting
- ❑ Automotive
- ❑ Constant current source
- ❑ Constant current sink

General Description

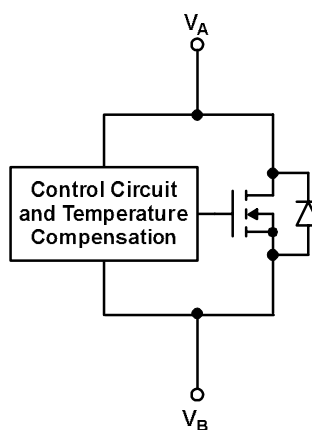
The Supertex CL2 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of $20\text{mA} \pm 10\%$ at an input voltage of 5-90V. No external components are required. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL2 is to drive LEDs with a constant current of 20mA. They can also be used in parallel to provide higher currents such as 40mA, 60mA or 80mA. The device is available in SOT-89, TO-252 (D-PAK), and TO-92 packages.

Typical Application Circuit



Functional Circuit Diagram



Ordering Information

Order Number / Package		
TO-92	TO-243AA*	TO-252
CL2N3	CL2N8	CL2K4

*Same as SOT-89 product supplied on 2000 piece tape reels.

Thermal Characteristics

Package	Power Dissipation @ T _A = 25°C	θ _{JC} °C/W	θ _{JA} °C/W
TO-92	0.6W	125	170
TO-243AA (SOT-89)	1.3W*	15	78*
TO-252 (D-PAK)	2.0W*	6.0	50*

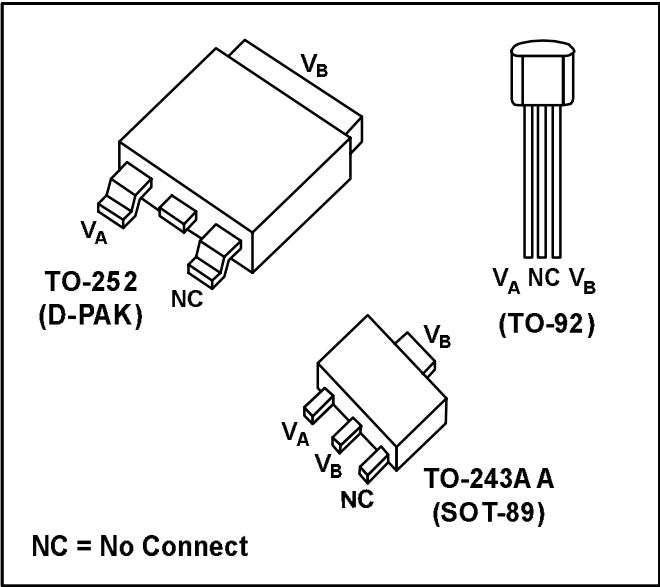
* Mounted on FR4 board; 25mm x 25mm x 1.57mm.

Absolute Maximum Ratings*

V _{A-B} , Operating Voltage	100V
T _J , Operating Junction Temperature	-40°C to +125°C
T _s , Storage Temperature	-55°C to +150°C

*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.

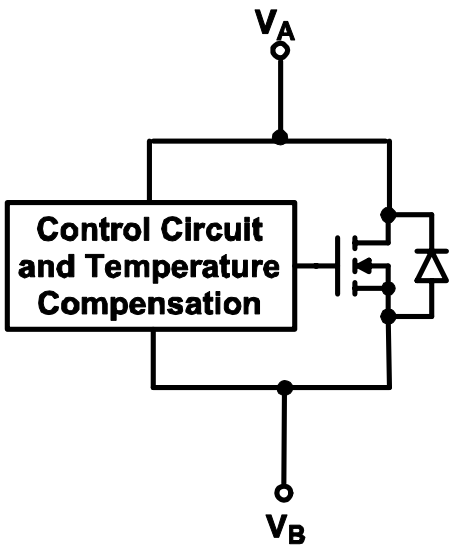
Package Options



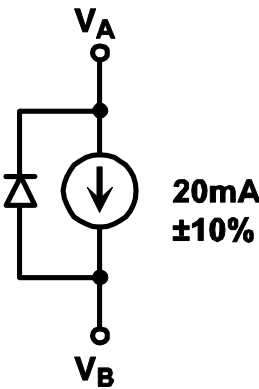
Electrical Characteristics (@ $T_J = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
V_{A-B}	Maximum operating voltage			90	V	
I_{A-B}	Current regulation	18.0	20.0	22.0	mA	$V_{A-B} = 5-90\text{V}$
$\Delta I_{A-B}/\Delta T$	I_{A-B} temperature coefficient		0.01		%/ $^{\circ}\text{C}$	$V_{A-B} = 45\text{V}$, $T_J = -40^{\circ}\text{C}$ to 100°C
T_J	Operating junction temperature	-40		125	$^{\circ}\text{C}$	
R_{A-B}	Dynamic resistance		300k		Ω	

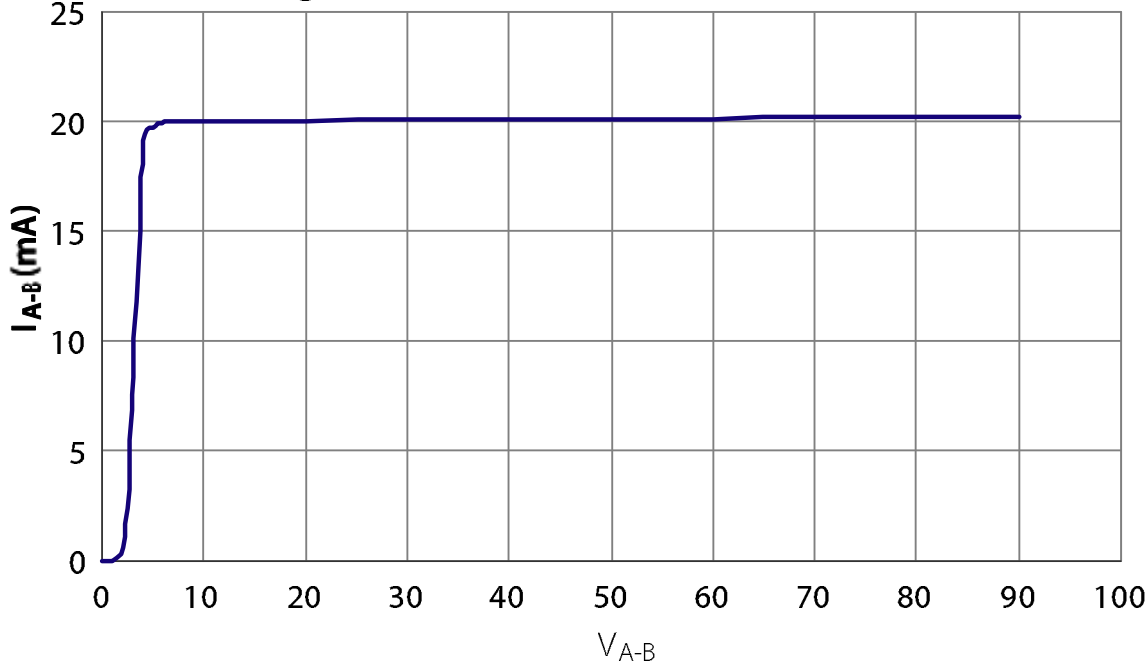
Functional Circuit Diagram



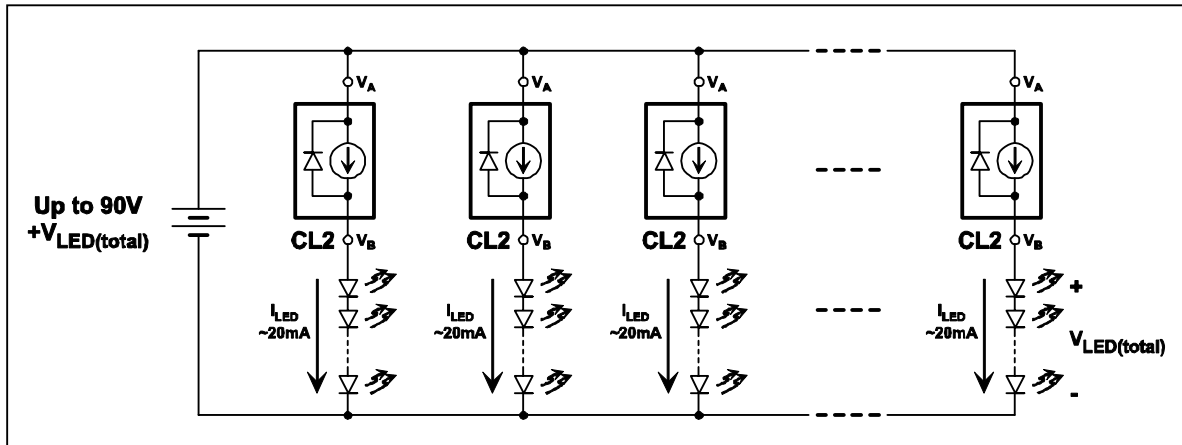
Equivalent Block Diagram



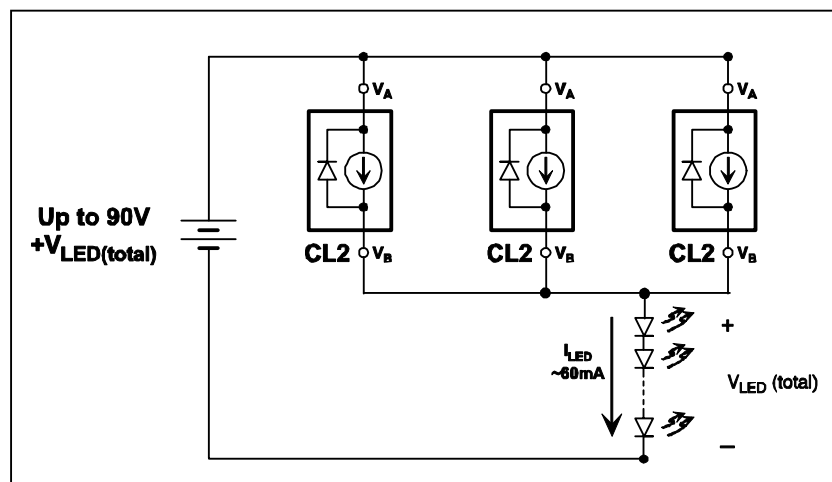
Output Current vs. Voltage



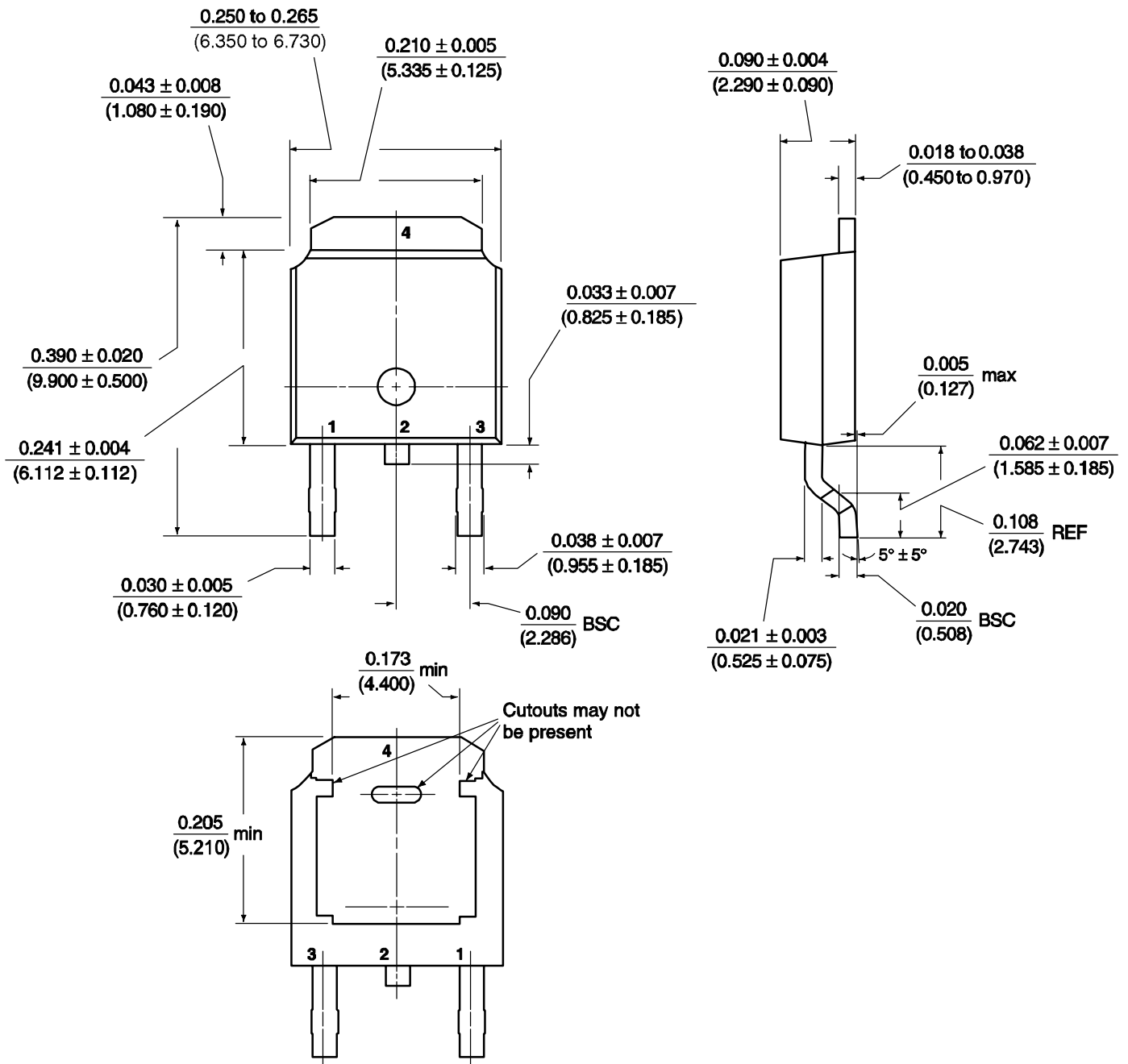
CL2 for Multiple LED Strings



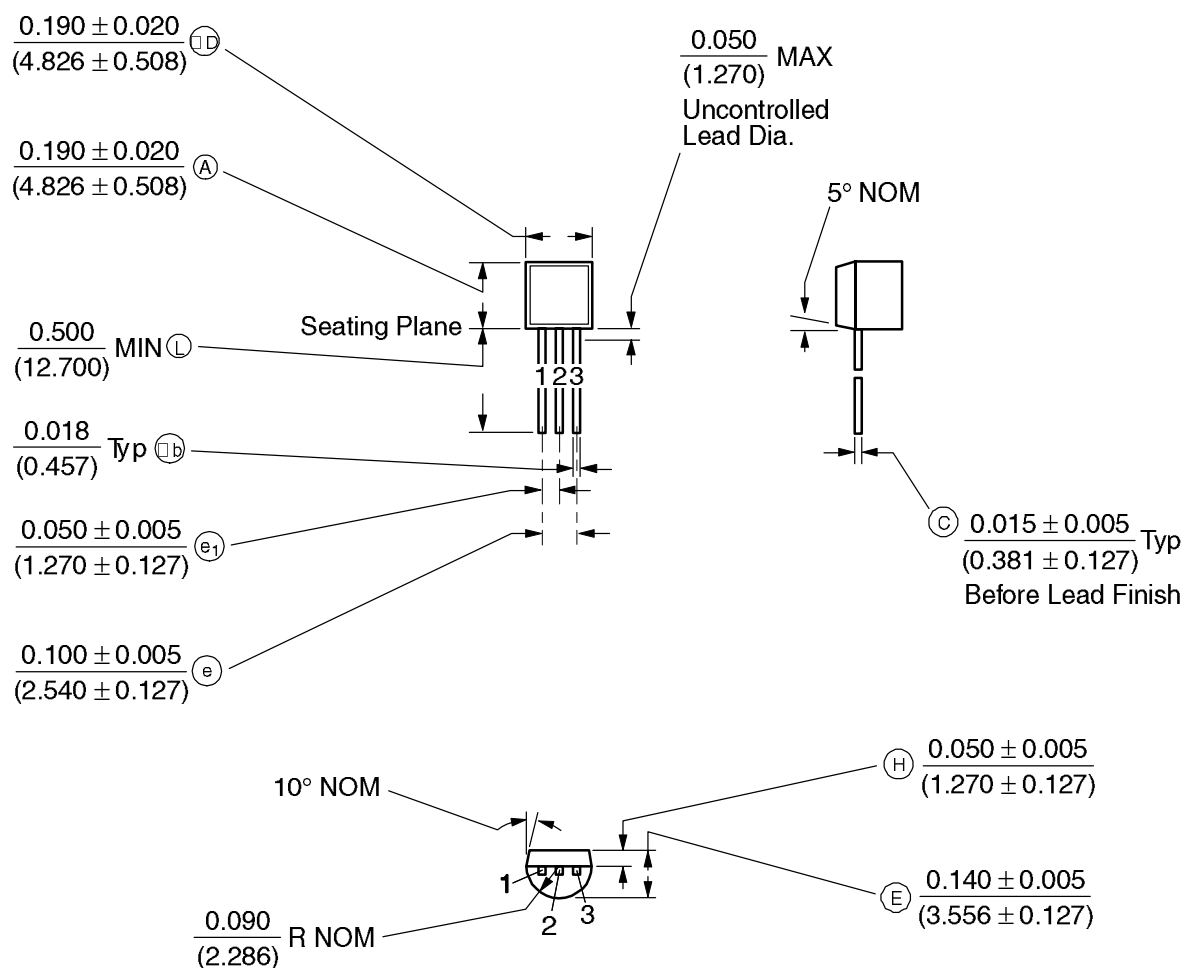
CL2 for Higher Current



3 Lead TO-252 (D-PAK) Package (K4)


$$\text{Measurement Legend} = \frac{\text{Dimensions in Inches}}{(\text{Dimensions in Millimeters})}$$

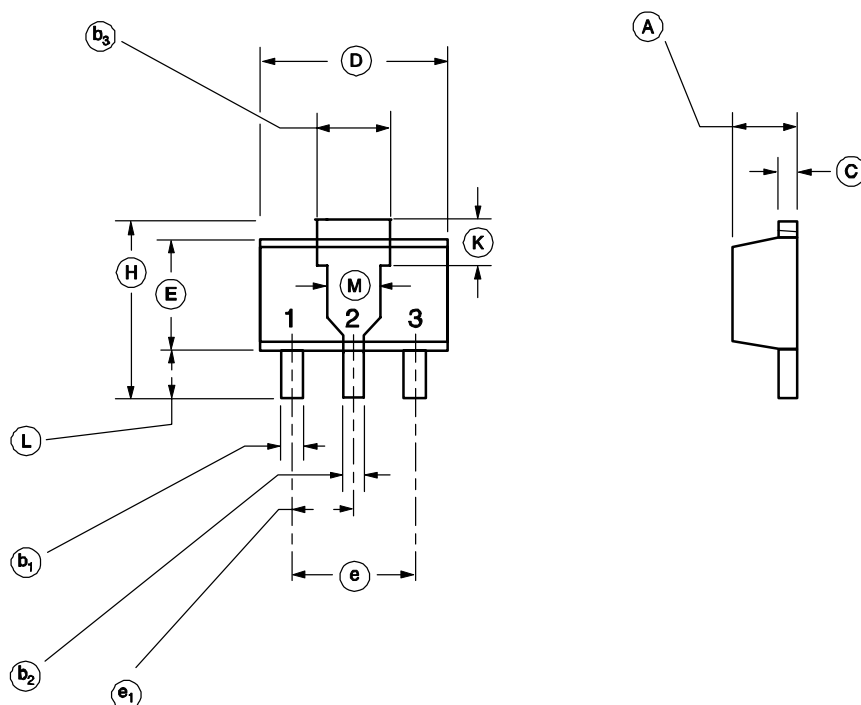
3 Lead TO-92 Plastic Package (N3)



Note: Circle (e.g. (B)) indicates JEDEC Reference.

Measurement Legend = $\frac{\text{Dimensions in Inches}}{(\text{Dimensions in Millimeters})}$

3-LEAD TO-243AA (SOT-89) Surface Mount Package (N8)



Dimensions				
Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.055	0.063	1.40	1.60
b1	0.014	0.019	0.35	0.48
b2	0.017	0.023	0.44	0.58
b3	0.064	0.072	1.62	1.83
C	0.014	0.017	0.35	0.44
D	0.173	0.181	4.40	4.60
E	0.090	0.102	2.29	2.60
e	.118BSC		3.00BSC	
e1	.059BSC		1.15BSC	
H	0.156	0.167	3.90	4.25
L	0.035	0.047	0.88	1.20
K	0.037	0.040	0.93	1.05
M	0.047	0.049	1.20	1.25

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Supertex inc.
 1235 Bordeaux Drive, Sunnyvale, CA 94089
 TEL: (408) 222-8888 / FAX: (408) 222-4895
www.supertex.com