

Descriptions

The EC86XX series is a high voltage , ultralow-power regulator. The device can allows an input voltage as high as 60V. The typical quiescent current is only 2 μ A. The device is available in fixed output voltages of 3.3V and 5.0V.

The device features integrated short-circuit and thermal shutdown protection.

Although designed primarily as fixed voltage regulators, the device can be used with external components to obtain variable voltages.

Feature

- Low Quiescent Current: 2 μ A
- High Input Voltage: Up to 80V
- High Output Current: 200mA
- Dropout Voltage:

70mV@10mA

700mV@100mA

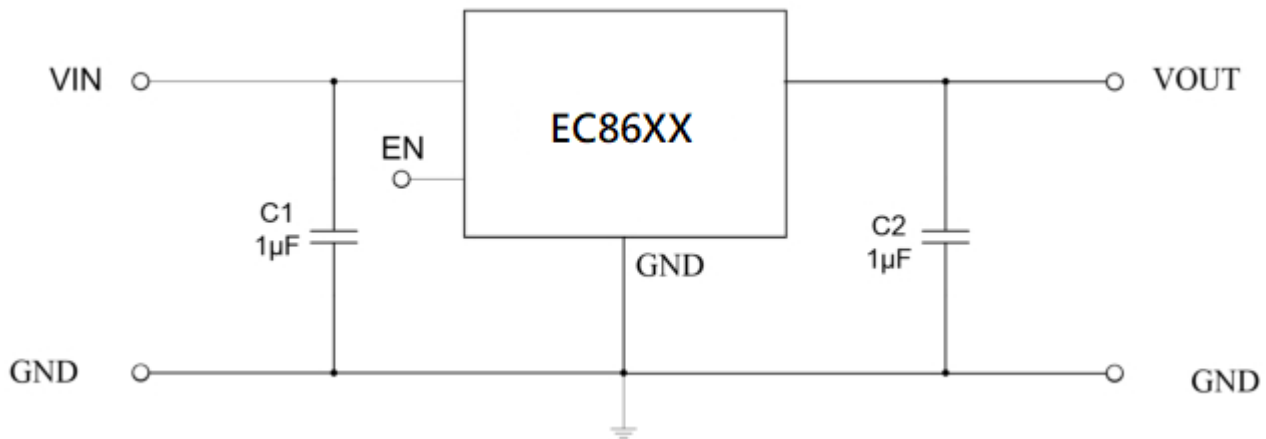
- Fixed Output Voltages : 3.3V and 5.0V

- High-accuracy Output Voltage
- With EN pin
- Good Transient Response
- Integrated Short-Circuit Protection
- Integrated Thermal Protection
- Available Packages : SOT23-3,SOT89,SOT23-5

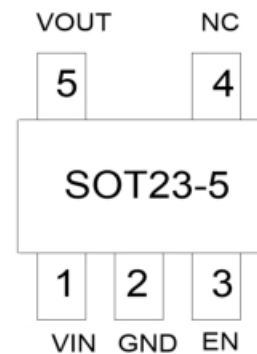
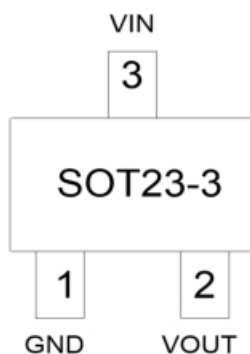
Application

- Battery-powered Smoke sensor
- Smoke detector and sensor
- Microcontroller Applications
- Smart electric meter

Typical Application



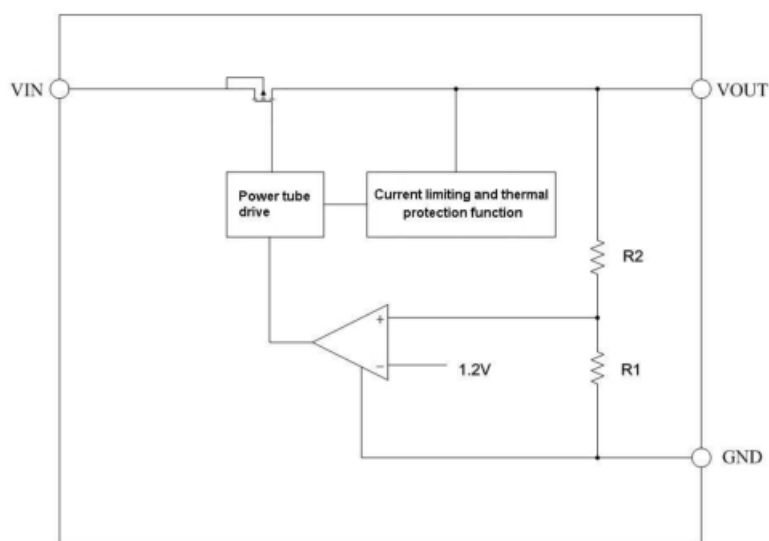
Pin Configuration



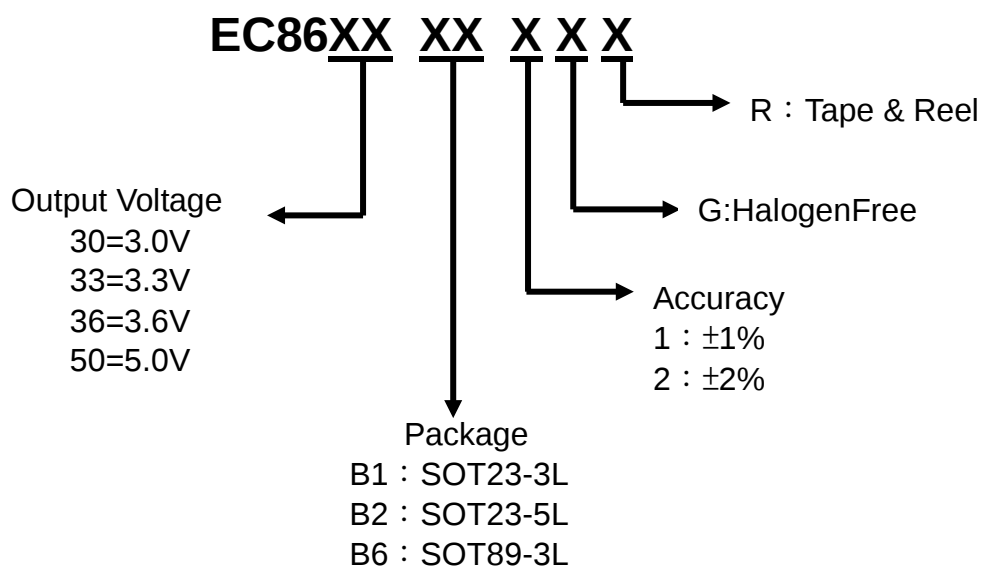
Pin Description

Pin Name	Pin Function Description
VIN	In put pin
VOUT	Out put pin
GND	Ground pin
EN	Enable pin
NC	No connection

Functional Block Diagram



Ordering Information





Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V _{IN}	Input Supply Voltage	80	V
V _{OUT} ---GND	Output Voltage TO GND	6	
V _{out} ----V _{IN}	Output Voltage TO V _{IN}	-35	
T _A	Operating Temperature	-40----105	°C
T _{STG}	Storage Temperature	-40---150	
T _J	Maximum Junction Temperature	150	
T _{LEAD}	Lead Temperature (Soldering) 10 seconds	260	
θ_{JA}	Thermal Resistance, Junction-to-Ambient	165(SOT89)	°C/W
		280(SOT23-3)	
		270(SOT23-5)	
P _D	Power Consumption	750(SOT89)	mW
		446(SOT23-3)	
		465(SOT23-5)	

Note : Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Recommended Operating Conditions

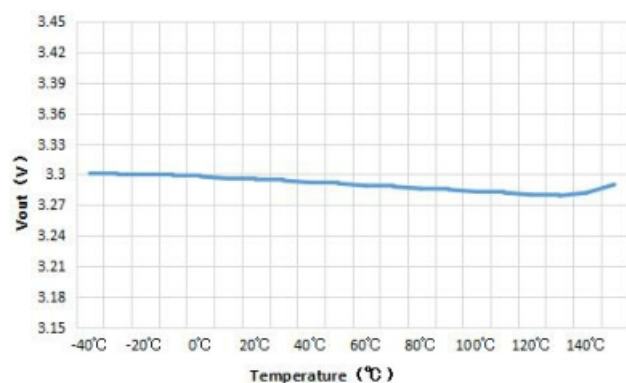
Symbol	Parameter	Maximum	Units
V _{IN}	Input Supply Voltage	60	V
T _A	Operating Temperature	-20----85	°C
T _{LEAD}	Lead Temperature (Soldering) 10 seconds	230	°C

**Electrical Characteristics**(TA=25°C, CIN=1 μ F, VIN=VOUT+1.0V, COUT=10 μ F, unless otherwise noted)

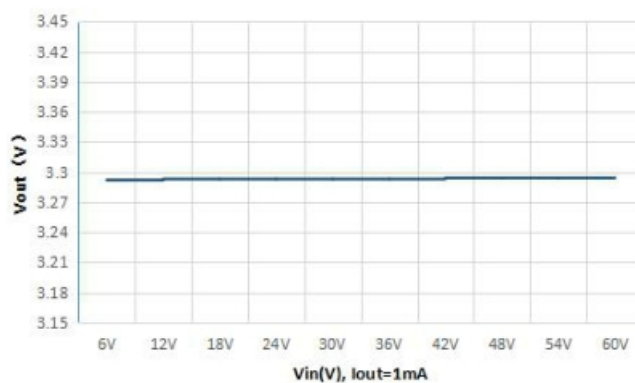
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{IN}	Input Supply Voltage		2.8		60	V
V _{OUT}	Output Voltage Accuracy	I _{OUT} =10mA	-1%		1%	V
			-2%		2%	V
I _Q	Quiescent Current	V _{IN} =6V~60V		1.8	4	μ A
I _{OUT}	Output Current			200		mA
V _{DROP}	Dropout Voltage	I _{OUT} =10mA $\Delta V_{OUT} = -V_{OUT} * 2\%$		70		mV
		I _{OUT} =100mA $\Delta V_{OUT} = -V_{OUT} * 2\%$		700		mV
V _{LR}	Load Regulation	1mA $\leq$ I _{OUT} $\leq$ 100mA		20		mV
V _{SR}	Line Regulation	I _{OUT} =1mA, V _{IN} =(V _{OUT} +1V) to 30V		0.2		%/V
I _{LIMIT}	Current Limit	V _{IN} =(V _{OUT} +1V) to 60V		400		mA
T _{SHDN}	Thermal Protection			125		°C
TC _{VOUT}	Output Voltage Temperature Coefficient	I _{OUT} =10mA -40°C $\leq$ T _{AMB} $\leq$ 100°C		-17		ppm/°C

Typical Performance Characteristics

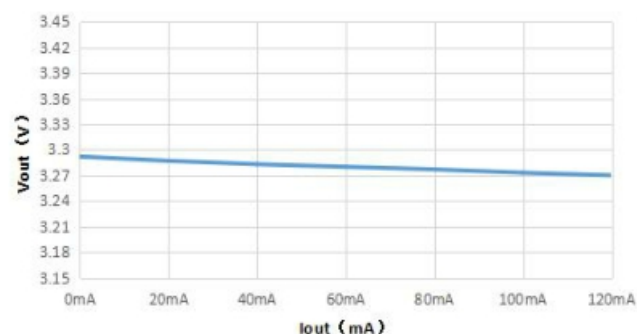
(TA=25°C, CIN=1 μ F, VIN=VOUT (3.3V) +1.0V, COUT=10 μ F, unless otherwise noted)



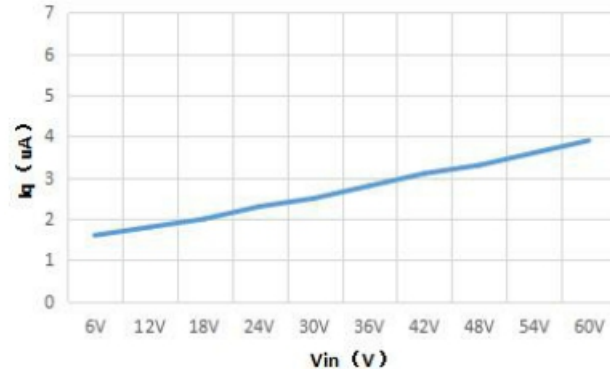
Output Voltage Temperature Coefficient



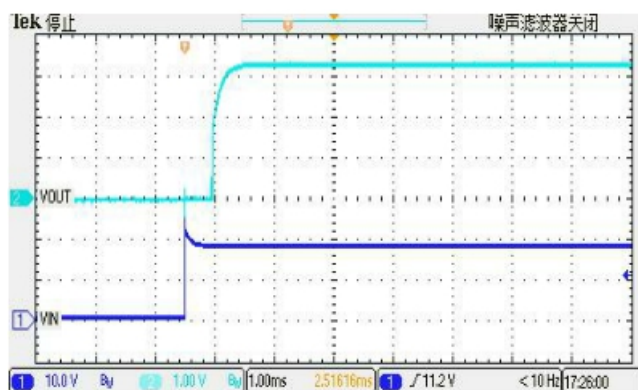
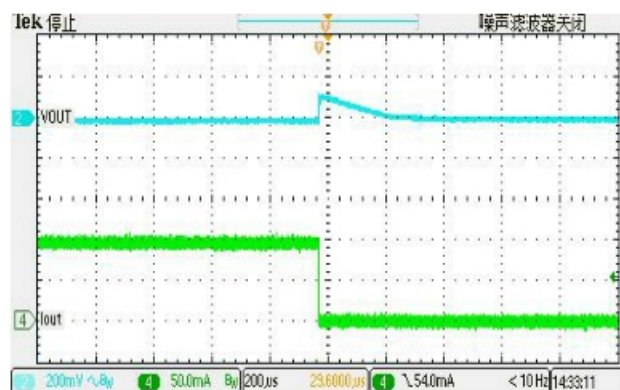
Line Regulation

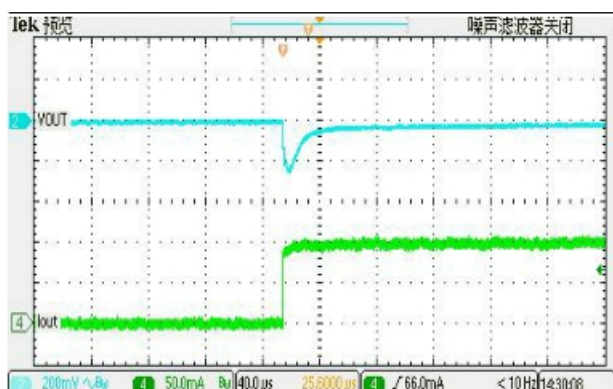


Load Regulation(Vin=12V)



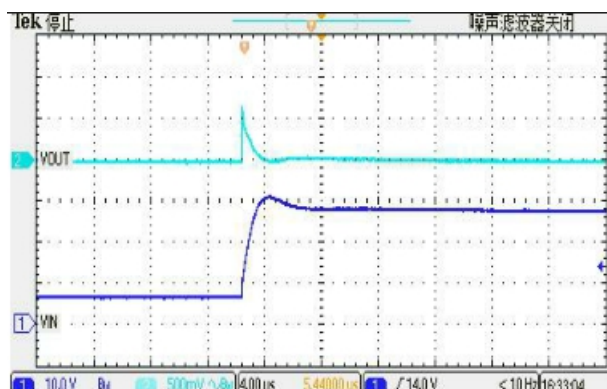
Quiescent Current(Iout=0mA, EN=VIN)


VIN=24V, No Load, COUT=10 μ F

VIN=12.0V, COUT=10 μ F, Iout=100mA to 10mA



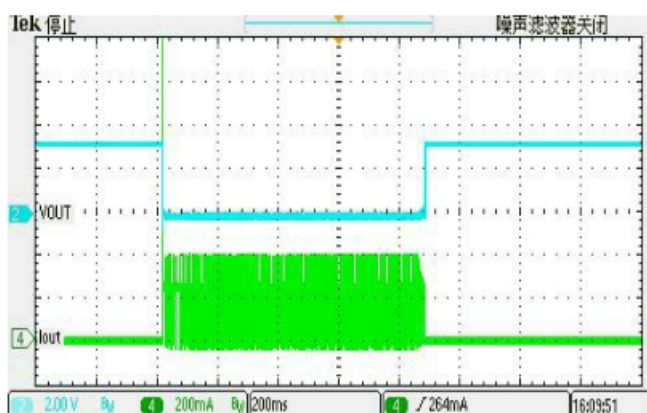
Load Transient

V_{IN}=12.0V, C_{OUT}=10 μ F, I_{OUT}=10mA to 100mA

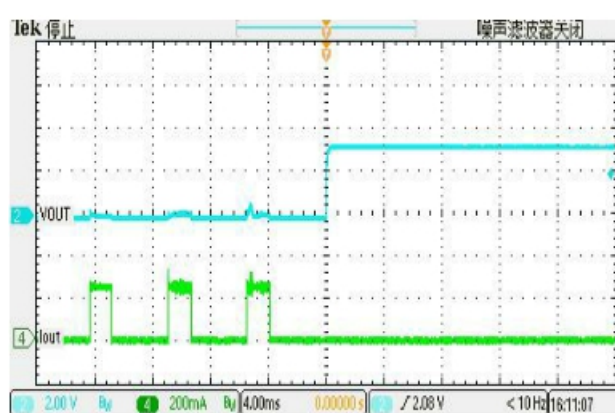


Line Transient

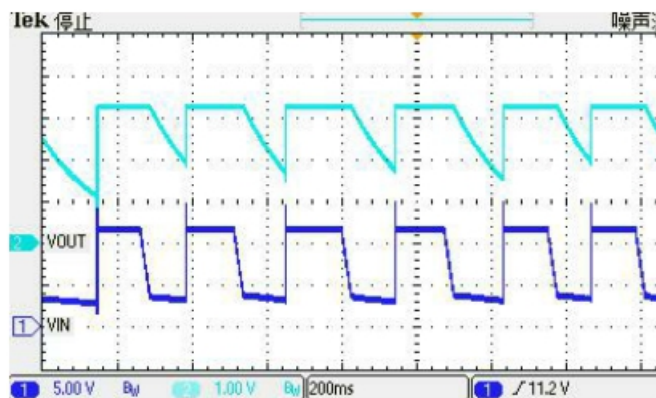
V_{IN}=6.3V to 30V, C_{OUT}=10 μ F, I_{OUT}=1mA



V_{IN}=25.0V , Short Protection Occurred

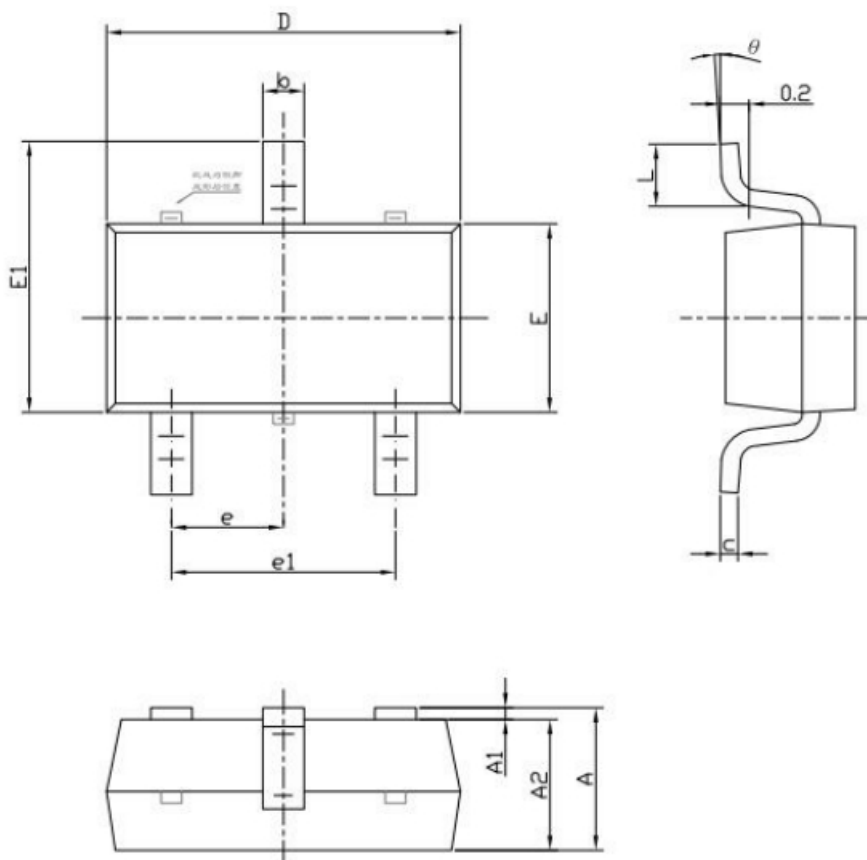


V_{IN}=25.0V , Short Protection Removed



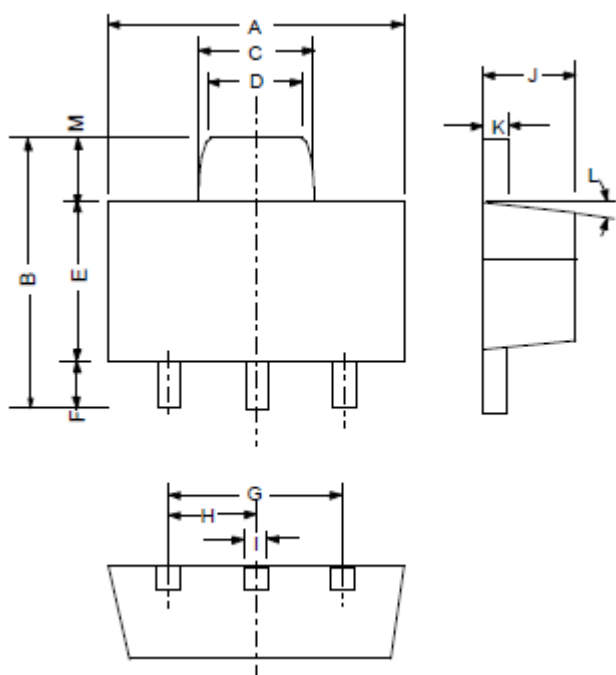
V_{IN}=12.0V , Fast open Vin

Outline Drawing for SOT-23-3



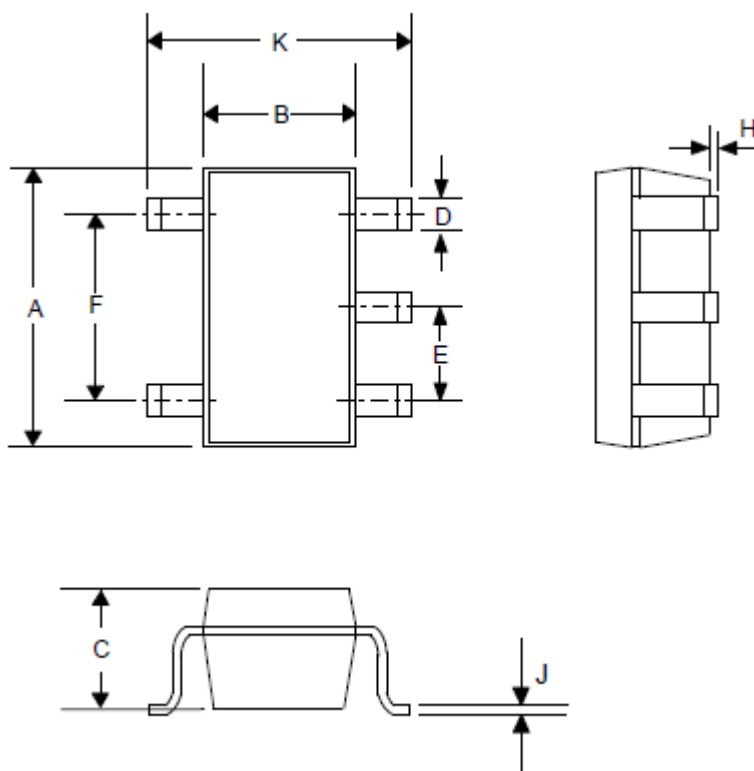
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Outline Drawing for SOT-89



DIMENSIONS				
DIM _N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.173	0.181	4.400	4.600
B	0.159	0.167	4.050	4.250
C	0.067	0.075	1.700	1.900
D	0.051	0.059	1.300	1.500
E	0.094	0.102	2.400	2.600
F	0.035	0.047	0.890	1.200
G	0.118 REF		3.00 REF	
H	0.059 REF		1.50 REF	
I	0.016	0.020	0.400	0.520
J	0.055	0.063	1.400	1.600
K	0.014	0.016	0.350	0.410
L	10 °TYP		10 °TYP	
M	0.028 REF		0.70 REF	

Outline Drawing for SOT-23-5



DIMENSIONS				
DIM _N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.110	0.120	2.80	3.05
B	0.059	0.070	1.50	1.75
C	0.036	0.051	0.90	1.30
D	0.014	0.020	0.35	0.50
E	-	0.037	-	0.95
F	-	0.075	-	1.90
H	-	0.006	-	0.15
J	0.0035	0.008	0.090	0.20
K	0.102	0.118	2.60	3.00