150mA DUAL OUTPUT CMOS LOW NOISE LOW-DROPOUT VOLTAGE REGULATOR

LR6155

Description

The LR6155 is a dual output, low noise, low-dropout regulator delivers at least 150mA of continuous output current. The output voltage for each regulator is set independently by trimming. Voltages are selectable in 100mV steps within a range of 1.3V to 5.0V. Typical output noise is 27uV$_{RMS}$, and PSRR is 65dB at 1KHz.

The LR6155 includes two independent logic-controlled shutdown inputs and allows the output of each regulator to be turned of independently.

The LR6155 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

The LR6155 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system and LR6155 uses trimming technique to guarantee output voltage accuracy within ±2%.

Features

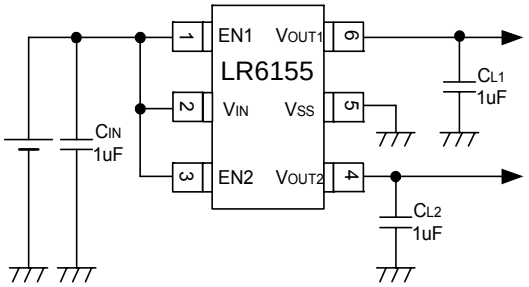
- Low Output Noise (27uV$_{RMS}$)
- Standby Mode: 0.1uA
- 150mA output current for each channel
- 25uA Operating Supply Current per channel
- High Ripple Rejection: 65dB@1KHz(Typ.)
- Low 130mV dropout at 100mA load
- Excellent Line Regulation: 0.05%/V
- Built-in chip Enable Circuit
- Independent Shutdown Controls
- Output Voltage Range: 1.3V~5.0V
- 250mA Output Current Limit
- Highly Accurate: ±2% (±1% customized)
- TSOP-6 Package
- We declare that the material of product compliance with RoHS requirements.

ISO14001 环境管理体系认证 ISO9001 质量管理体系认证

Application

- Power Source for Cellular Phones and various kind of PCs
- Battery Powered Equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Reference Voltage Source
- Regulation after Switching Power
- Notebook and Handheld equipment
- Wireless LAN, Bluetooth, GPS Receivers
- Cordless Phones
- Radio Communication Equipment

Typical Application



Ordering Information

Package Type	Part Number	
TSOP-6	E6	LR6155E6-XZ
Note	X: Output Portfolio See output voltage portfolio Z: Pin Type, C or D	

Pin Description

Top View



Pin #		Symbol	Function
Type C	Type D		
1	6	V_{OUT1}	Output1 Pin
2	2	V_{IN}	Input Pin
3	4	V_{OUT2}	Output2 Pin
4	3	CE2	Chip Enable Pin2
5	5	GND	Ground Pin
6	1	CE1	Chip Enable Pin1

Output Voltage Portfolio

Output Voltage			Part Number		Output Voltage			Part Number	
Code	V_1	V_2	Type C	Type D	Code	V_1	V_2	Type C	Type D
A	1.5	2.5	LR6155E6-AC	LR6155E6-AD	M	2.8	1.8	LR6155E6-MC	LR6155E6-MD
B	1.5	2.8	LR6155E6-BC	LR6155E6-BD	N	2.8	2.5	LR6155E6-NC	LR6155E6-ND
C	1.5	3.0	LR6155E6-CC	LR6155E6-CD	O	2.8	2.8	LR6155E6-OC	LR6155E6-OD
D	1.5	3.3	LR6155E6-DC	LR6155E6-DD	P	2.8	3.0	LR6155E6-PC	LR6155E6-PD
E	1.5	4.0	LR6155E6-EC	LR6155E6-ED	Q	3.0	2.5	LR6155E6-QC	LR6155E6-QD
F	1.8	1.8	LR6155E6-FC	LR6155E6-FD	R	3.0	3.0	LR6155E6-RC	LR6155E6-RD
G	1.8	2.5	LR6155E6-GC	LR6155E6-GD	S	3.0	3.3	LR6155E6-SC	LR6155E6-SD
H	1.8	2.8	LR6155E6-HC	LR6155E6-HD	T	3.3	1.8	LR6155E6-TC	LR6155E6-TD
I	1.8	3.0	LR6155E6-IC	LR6155E6-ID	U	3.3	2.5	LR6155E6-UC	LR6155E6-UD
J	1.8	3.3	LR6155E6-JC	LR6155E6-JD	V	3.3	2.8	LR6155E6-VC	LR6155E6-VD
K	2.5	1.8	LR6155E6-KC	LR6155E6-KD	W	3.3	3.3	LR6155E6-WC	LR6155E6-WD
L	2.5	2.5	LR6155E6-LC	LR6155E6-LD	X	2.8	1.5	LR6155E6-XC	LR6155E6-XD

Absolute Maximum Ratings

Max Input Voltage	8V
Junction Temperature(T_J)	125°C
Output Current	200mA
Power Dissipation (TSOP-6)	400mW
Storage Temperature (Ts)	-45°C~150°C
Lead Temperature and Time	260°C, 10S

Stresses beyond 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 Electrical Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics

Test Conditions: C1=C2=C3=1uF, T_A=25°C, unless otherwise noted.

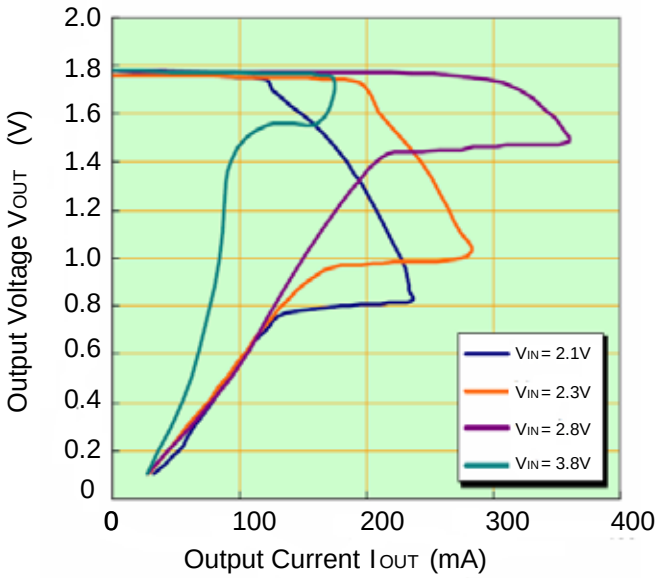
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage		1.5		6	V
V_{OUT}	Output Voltage	V_{IN}=Set V_{OUT}+1V 1mA≦I_{OUT}≦30mA	V_{OUT} x0.98		V_{OUT} x1.02	V
I_{OUT} (Max)	Max Output Current	V_{IN}-V_{OUT}=1V	150			mA
Dropout Voltage	Input-Output Voltage Differential	Refer to the Electrical Characteristics by output voltage				
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	I_{OUT}=40mA 1.6V≦Vin≦8V		0.05	0.2	%/V
$\Delta V_{OUT}/\Delta I_{OUT}$	Load Regulation	V_{IN}=Set V_{OUT}+1V 1mA≦I_{OUT}≦80mA		12	40	mV
Iss	Supply Current	V_{IN}=Set V_{OUT}+1V		25	50	uA
$I_{STANDBY}$	Supply Current (Standby)	V_{IN}=Set V_{OUT}+1V, V_{CE}=GND		0.1	1.0	uA
$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	Output Voltage Temperature Coefficiency	I_{OUT} =30mA		±100		ppm/°C
PSRR	Ripple Rejection	F=1KHz, Ripple=0.5Vp-p V_{IN}=Set V_{OUT}+1V		65		dB
V_{CEH}	CE Input Voltage “H”		1.5		V_{IN}	V
V_{CEL}	CE Input Voltage “L”		0		0.25	V
en	Output Noise	BW=10Hz~100KHz		27		uV_{RMS}

Electrical Characteristics by Output Voltage

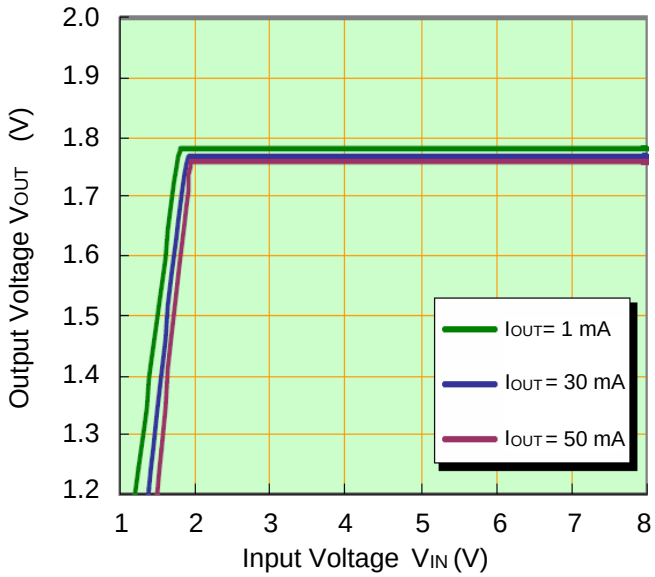
Output Voltage V_{OUT} (V)	Dropout Voltage, V_{DIF} (mV)		
	Condition	Typ.	Max
V_{OUT} =1.8V	I_{OUT} =40mA	58	80
V_{OUT} =2.8V		50	76

Typical Performance Characteristics

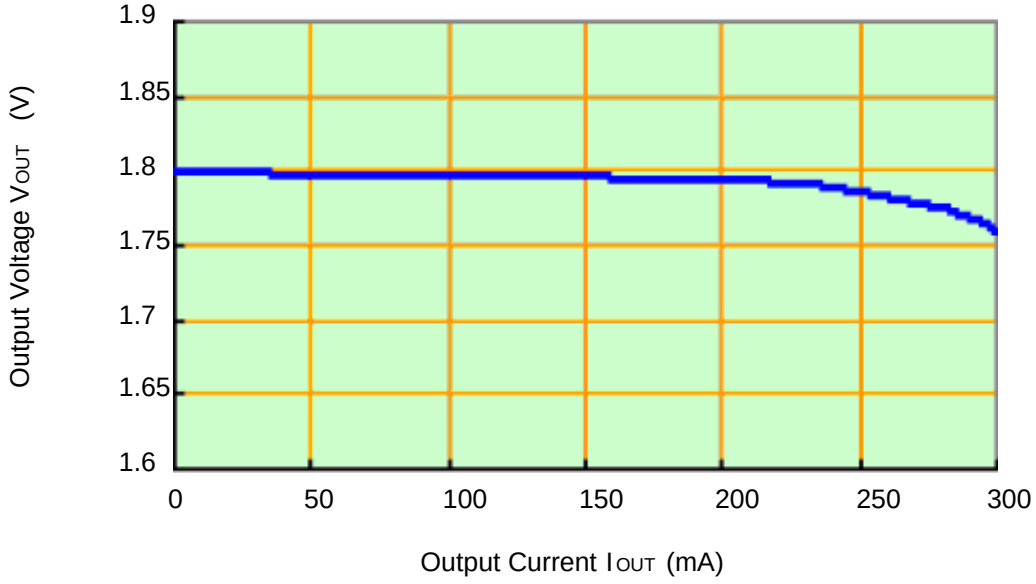
1. Output Voltage vs. Output Current
(with output short protection) Output: 1.8V



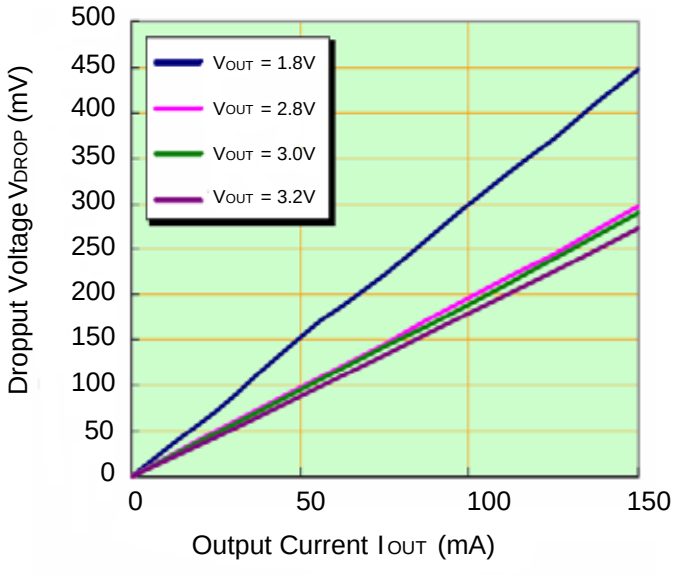
2. Output Voltage vs. Input Voltage
Output: 1.8V



3. 1.8V output circuit

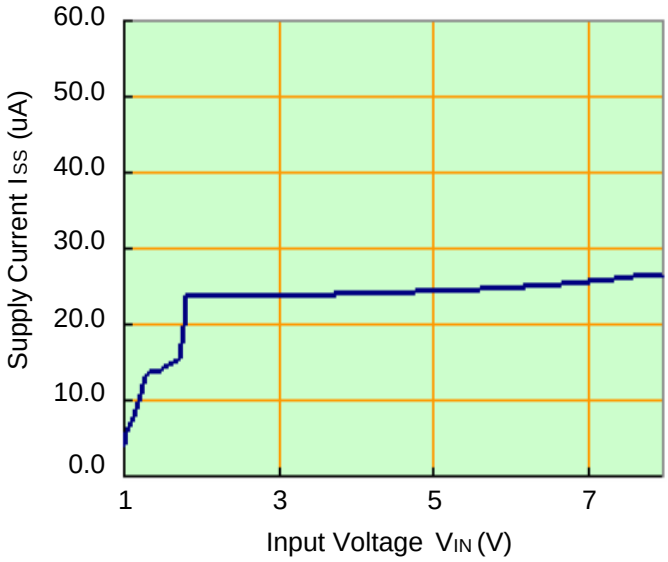


4. Dropout Voltage vs. Output Current

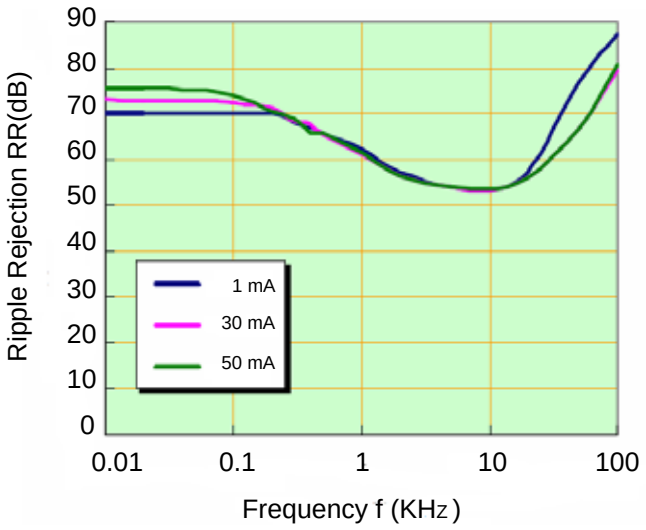


5. Supply Current vs. Input Voltage

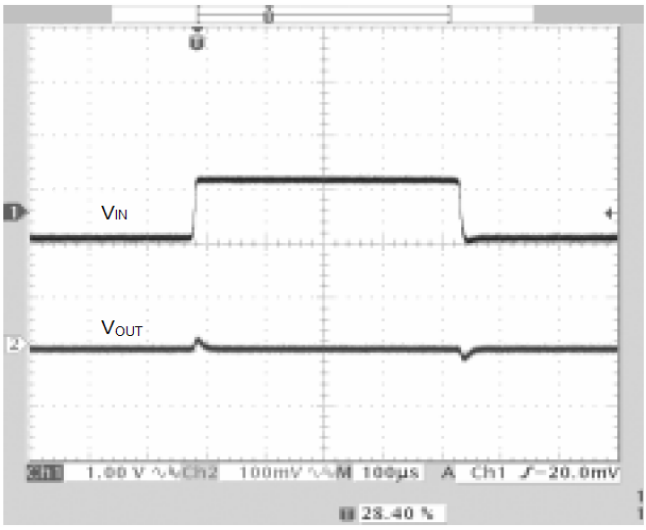
Output: 1.8V



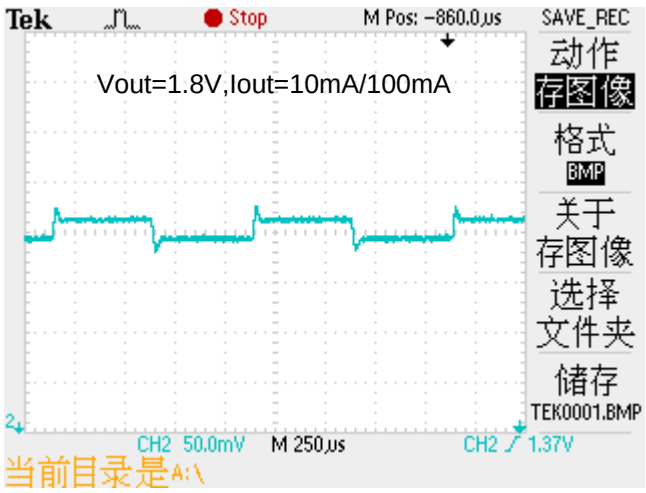
6. Ripple Rejection vs. Frequency

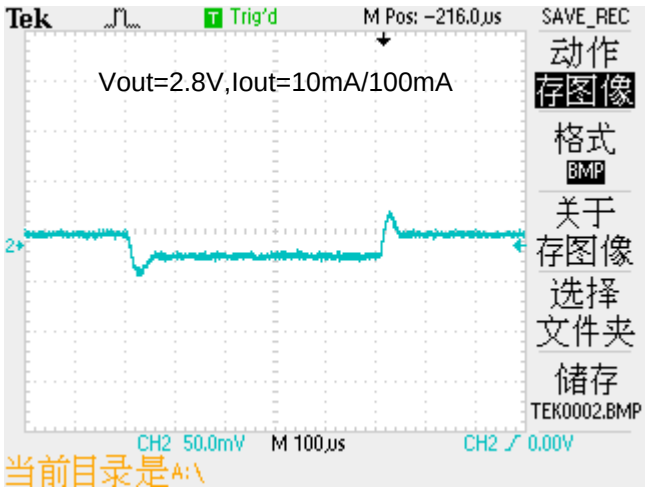


7. Line Transient Response

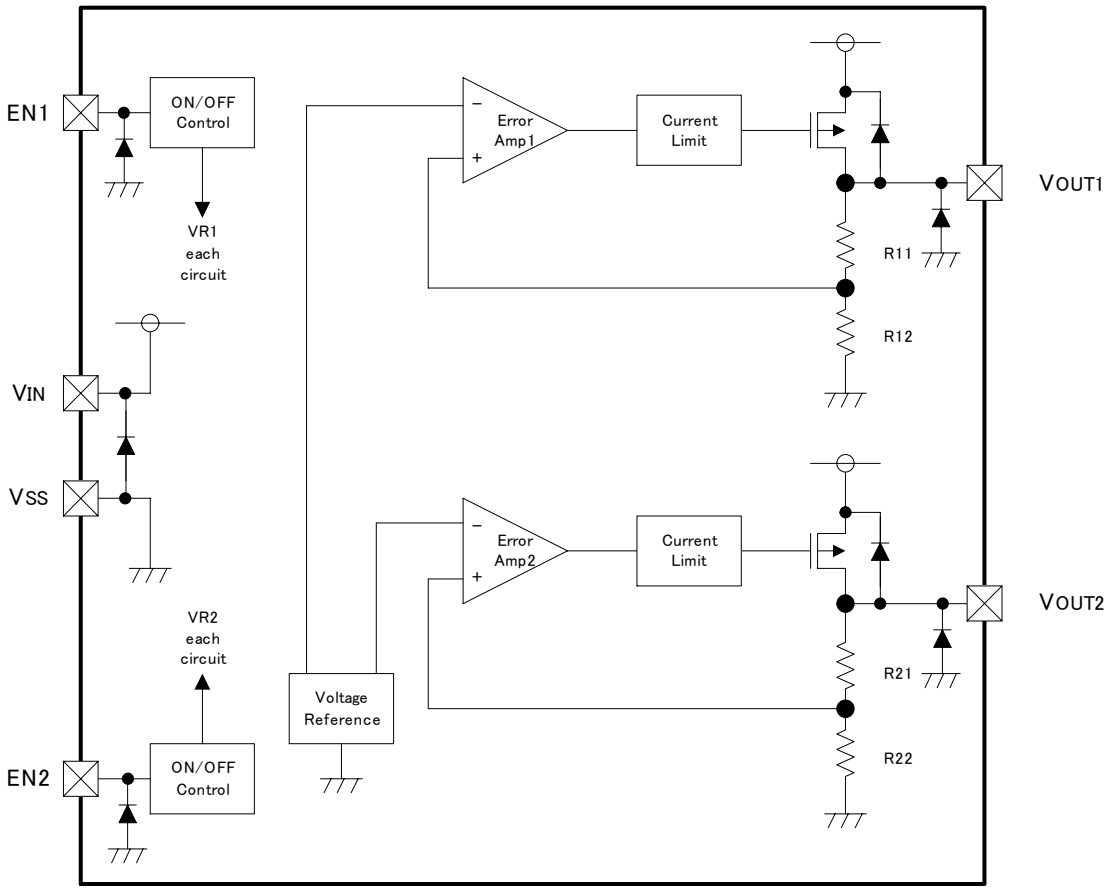


8. Load Transient Response



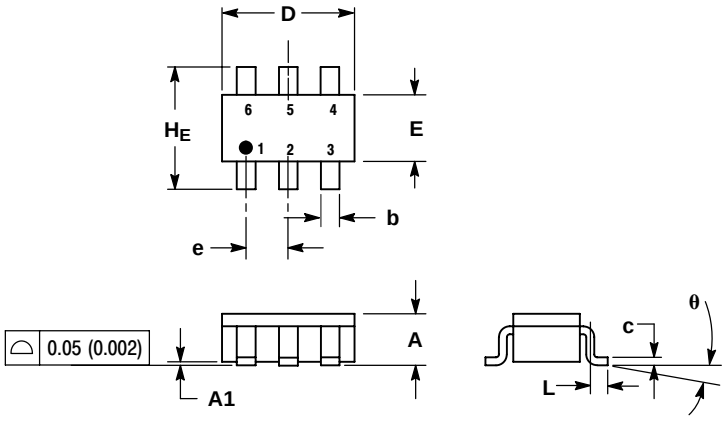


Block Diagram



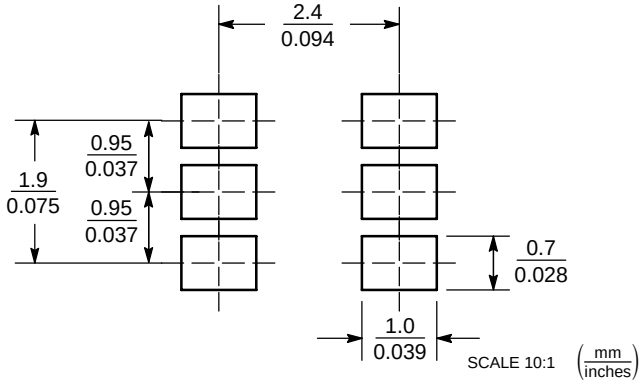
Package Information

TSOP−6

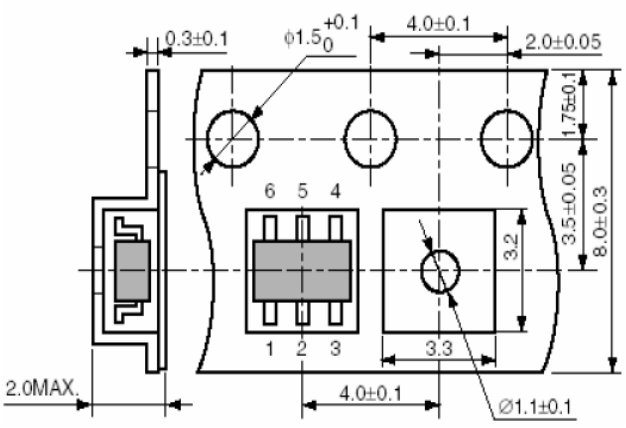


DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.38	0.50	0.010	0.014	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
H_E	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	–	10°	0°	–	10°

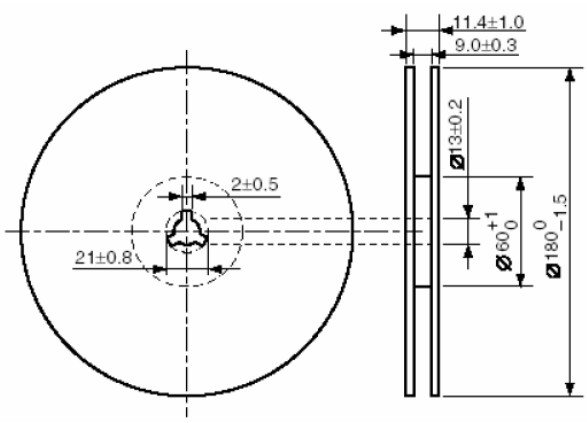
SOLDERING FOOTPRINT



Tape Dimension

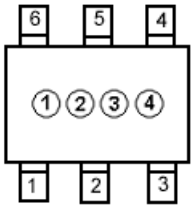


Reel Dimension

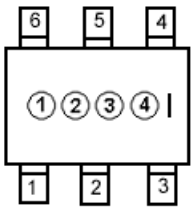


MARKING DIAGRAM

TSOP-6(C)



TSOP-6(D)



1: "L"

2: Vout,See Below List 1.

3: Annual,for example "9" for "2009" ;
"$\bar{0}$" for "2010".

4: Weeks,See Below List 2.

List 1

	Vout1	Vout2		Vout1	Vout2
A	1.5V	2.5V	N	2.8V	2.5V
B	1.5V	2.8V	O	2.8V	2.8V
C	1.5V	3.0V	P	2.8V	3.0V
D	1.5V	3.3V	Q	3.0V	2.5V
E	1.5V	4.0V	R	3.0V	3.0V
F	1.8V	1.8V	S	3.0V	3.3V
G	1.8V	2.5V	T	3.3V	1.8V
H	1.8V	2.8V	U	3.3V	2.5V
I	1.8V	3.0V	V	3.3V	2.8V
J	1.8V	3.3V	W	5.0V	3.3V
K	2.5V	1.8V	X	2.8V	1.5V
L	2.5V	2.5V	Y	2.8V	3.3V
M	2.8V	1.8V	Z		

List 2

Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg
A	1	L	12	W	23	$\bar{H}$	34	$\bar{S}$	45
B	2	M	13	X	24	$\bar{I}$	35	$\bar{T}$	46
C	3	N	14	Y	25	$\bar{J}$	36	$\bar{U}$	47
D	4	O	15	Z	26	$\bar{K}$	37	$\bar{V}$	48
E	5	P	16	$\bar{A}$	27	$\bar{L}$	38	$\bar{W}$	49
F	6	Q	17	$\bar{B}$	28	$\bar{M}$	39	$\bar{X}$	50
G	7	R	18	$\bar{C}$	29	$\bar{N}$	40	$\bar{Y}$	51
H	8	S	19	$\bar{D}$	30	$\bar{O}$	41	$\bar{Z}$	52
I	9	T	20	$\bar{E}$	31	$\bar{P}$	42		
J	10	U	21	$\bar{F}$	32	$\bar{Q}$	43		
K	11	V	22	$\bar{G}$	33	$\bar{R}$	44		

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