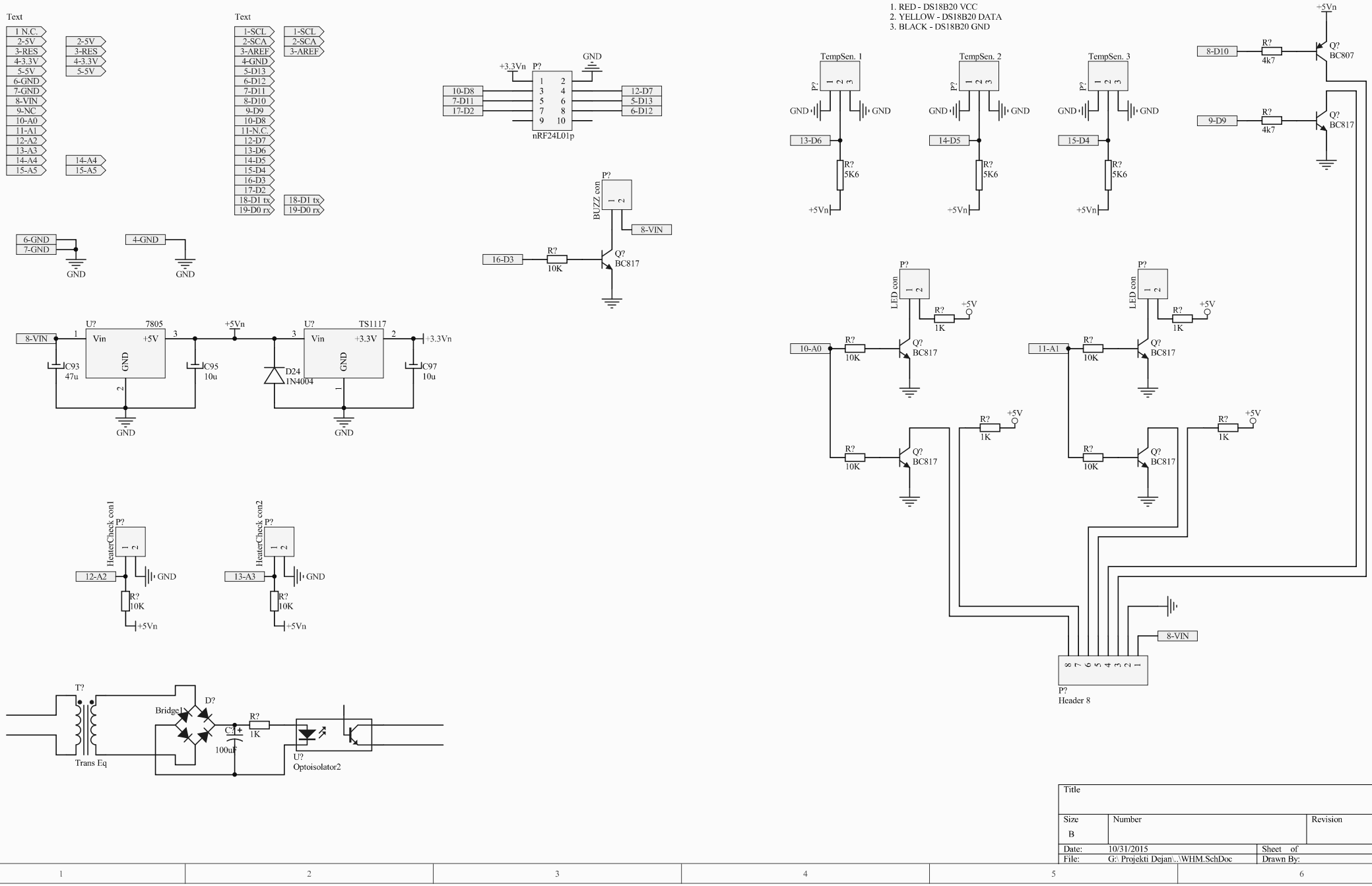
Text
1 N.C.
2-5V
3-RES
4-3.3V
5-5V
6-GND
7-GND
8-VIN
9-NC
10-A0
11-A1
12-A2
13-A3
14-A4
15-A5
2-5V
3-RES
4-3.3V
5-5V
14-A4
15-A5
Text
1-SCL
2-SCA
3-AREF
4-GND
5-D13
6-D12
7-D11
8-D10
9-D9
10-D8
11-N.C.
12-D7
13-D6
14-D5
15-D4
16-D3
17-D2
18-D1 tx
19-D0 rx
1-SCL
2-SCA
3-AREF
18-D1 tx
19-D0 rx
6-GND
7-GND
GND
4-GND
GND
+3.3Vn
P?
GND
10-D8
7-D11
17-D2
12-D7
5-D13
6-D12
nRF24L01p
P?
BUZZ con
8-VIN
16-D3
R?
10K
Q?
BC817
8-VIN
U?
7805
Vin
+5V
GND
C93
47u
C95
10u
+5Vn
U?
TS1117
Vin
+3.3V
GND
D24
1N4004
C97
10u
+3.3Vn
GND
GND
HeaterCheck con1
P?
12-A2
GND
R?
10K
+5Vn
HeaterCheck con2
P?
13-A3
GND
R?
10K
+5Vn
T?
Bridge1
D?
R?
1K
C?
100uF
Trans Eq
U?
Optoisolator2
1. RED - DS18B20 VCC
2. YELLOW - DS18B20 DATA
3. BLACK - DS18B20 GND
TempSen. 1
P?
GND
GND
13-D6
R?
5K6
+5Vn
TempSen. 2
P?
GND
GND
14-D5
R?
5K6
+5Vn
TempSen. 3
P?
GND
GND
15-D4
R?
5K6
+5Vn
+5Vn
8-D10
R?
4k7
Q?
BC807
9-D9
R?
4k7
Q?
BC817
P?
LED con
+5V
R?
1K
10-A0
R?
10K
Q?
BC817
R?
1K
+5V
R?
10K
Q?
BC817
P?
LED con
+5V
R?
1K
11-A1
R?
10K
Q?
BC817
R?
1K
+5V
R?
10K
Q?
BC817
8-VIN
P?
Header 8
Title
Size
B
Number
Revision
Date:
10/31/2015
Sheet of
File:
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Drawn By:

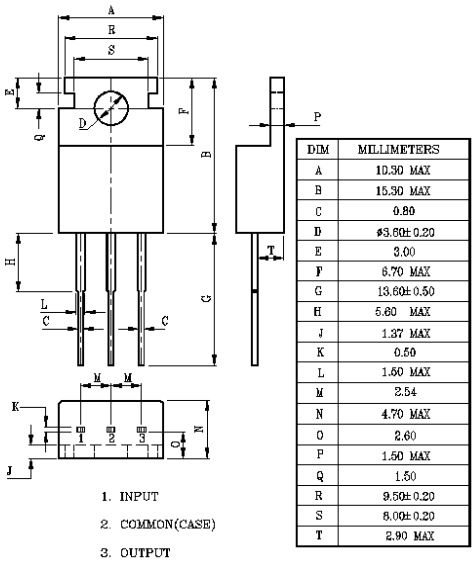
THREE TERMINAL POSITIVE VOLTAGE REGULATORS
5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 20V, 24V.

FEATURES

- Suitable for C-MOS, TTL, the Other Digital IC's Power Supply.
- Internal Thermal Overload Protection.
- Internal Short Circuit Current Limiting.
- Output Current in Excess of 1A.
- Satisfies IEC-65 Specification. (International Electronical Commission).

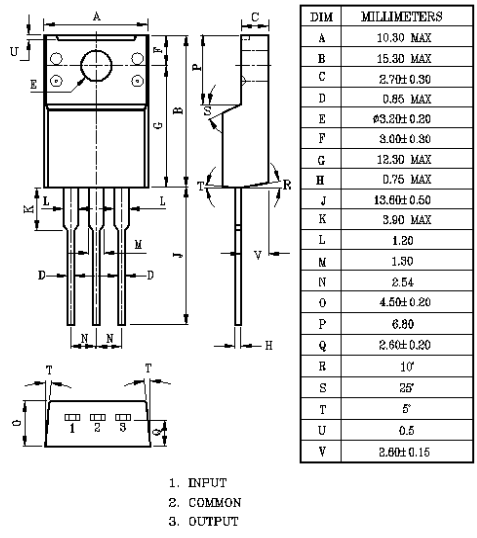
MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	KIA7805AP/API~ KIA7815AP/API	V_{IN}	35	V
	KIA7818AP/API~ KIA7824AP/API		40	
Power Dissipation (Tc=25℃)		P_D	20.8	W
Power Dissipation (Without Heatsink)	KIA7805API~ KIA7824API	P_D	2.0	W
Operating Junction Temperature		T_j	-30~150	℃
Storage Temperature		T_{stg}	-55~150	℃



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	0.80
D	ø3.60±0.20
E	3.00
F	6.70 MAX
G	13.60±0.50
H	5.60 MAX
J	1.37 MAX
K	0.50
L	1.50 MAX
M	2.54
N	4.70 MAX
O	2.60
P	1.50 MAX
Q	1.50
R	9.50±0.20
S	8.00±0.20
T	2.90 MAX

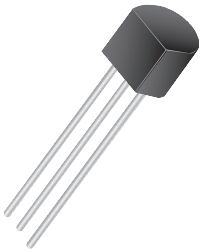
TO-220AB



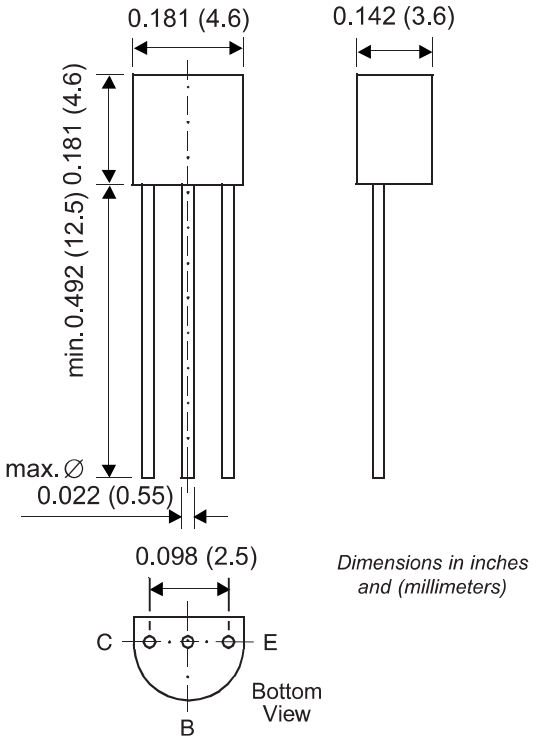
DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	2.70±0.30
D	0.85 MAX
E	ø3.20±0.20
F	3.00±0.30
G	12.30 MAX
H	0.75 MAX
J	13.60±0.50
K	3.90 MAX
L	1.20
M	1.30
N	2.54
O	4.50±0.20
P	6.80
Q	2.60±0.20
R	10°
S	25°
T	5°
U	0.5
V	2.60±0.15

TO-220IS

Small Signal Transistors (PNP)



TO-226AA (TO-92)



Features

- PNP Silicon Epitaxial Planar Transistors for switching and amplifier applications. Especially suitable for AF-driver stages and low-power output stages.
- These types are also available subdivided into three groups, -16, -25, and -40, according to their DC current gain. As complementary types, the NPN transistors BC327 and BC338 are recommended.
- On special request, these transistors are also manufactured in the pin configuration TO-18.

Mechanical Data

Case: TO-92 Plastic Package

Weight: approx. 0.18g

Packaging Codes/Options:

E6/Bulk – 5K per container, 20K/box
E7/4K per Ammo mag., 20K/box

Maximum Ratings & Thermal Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage	BC327 BC328	$-V_{CES}$	50 30	V
Collector-Emitter Voltage	BC327 BC328	$-V_{CEO}$	45 25	V
Emitter-Base Voltage		$-V_{EBO}$	5	V
Collector Current		$-I_C$	800	mA
Peak Collector Current		$-I_{CM}$	1	A
Base Current		$-I_B$	100	mA
Power Dissipation at Tamb = 25°C		P_{tot}	625(1)	mW
Thermal Resistance Junction to Ambient Air		$R_{\Theta JA}$	200(1)	°C/W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_S	–65 to +150	°C

Note: (1) Valid provided that leads are kept at ambient temperature at a distance of 2mm from case.

NPN general purpose transistor BC337

FEATURES

- High current (max. 500 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose switching and amplification, e.g. driver and output stages of audio amplifiers.

DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package.
PNP complement: BC327.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector

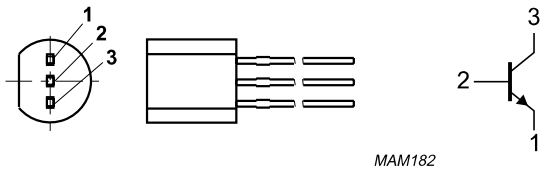


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	50	V
V_{CEO}	collector-emitter voltage	open base	–	45	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–	500	mA
I_{CM}	peak collector current		–	1	A
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	625	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

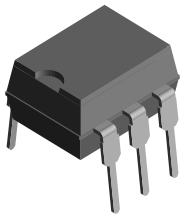
Note

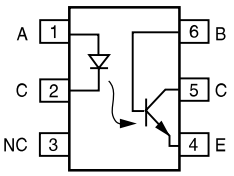
1. Transistor mounted on an FR4 printed-circuit board.

Optocoupler, Phototransistor Output, With Base Connection

Features

- Isolation Test Voltage 5300 V_{RMS}
- Long Term Stability
- Industry Standard Dual-in-Line Package
- Lead-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC





i179004

Agency Approvals

- Underwriters Lab File #E52744
  System Code H or J
- DIN EN 60747-5-2 (VDE0884)
  DIN EN 60747-5-5 pending
- BSI IEC60950 IEC60065
- FIMKO

Description

The CNY17 is an optically coupled pair consisting of a Gallium Arsenide infrared emitting diode optically coupled to a silicon NPN pfototransitor.

Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output.

The CNY17 can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

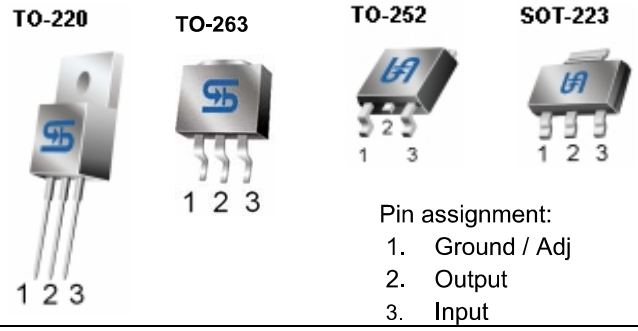
Order Information

Part	Remarks
CNY17-1	CTR 40 - 80 %, DIP-6
CNY17-2	CTR 63 - 125 %, DIP-6
CNY17-3	CTR 100 - 200 %, DIP-6
CNY17-4	CTR 160 - 320 %, DIP-6
CNY17-1X006	CTR 40 - 80 %, DIP-6 400 mil (option 6)
CNY17-1X007	CTR 40 - 80 %, SMD-6 (option 7)
CNY17-1X009	CTR 40 - 80 %, SMD-6 (option 9)
CNY17-2X006	CTR 63 - 125 %, DIP-6 400 mil (option 6)
CNY17-2X007	CTR 63 - 125 %, SMD-6 (option 7)
CNY17-2X009	CTR 63 - 125 %, SMD-6 (option 9)
CNY17-3X006	CTR 100 - 200 %, DIP-6 400 mil (option 6)
CNY17-3X007	CTR 100 - 200 %, SMD-6 (option 7)
CNY17-3X009	CTR 100 - 200 %, SMD-6 (option 9)
CNY17-4X006	CTR 160 - 320 %, DIP-6 400 mil (option 6)
CNY17-4X007	CTR 160 - 320 %, SMD-6 (option 7)
CNY17-4X009	CTR 160 - 320 %, SMD-6 (option 9)

For additional information on the available options refer to Option Information.

TS1117

800mA Low Dropout Positive Voltage Regulator



Pin assignment:
1. Ground / Adj
2. Output
3. Input

Low Dropout Voltage 1.3V max.

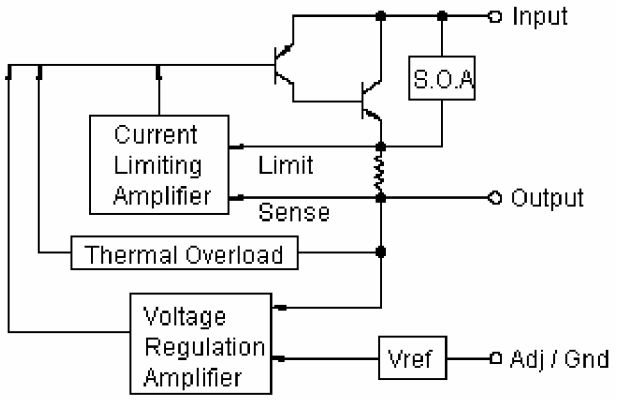
General Description

The TS1117 Series are high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current, Additionally, the PJ1117 Series provides excellent regulation over variations due to changes in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The TS1117 Series are three terminal regulators with fixed and adjustable voltage options available in popular packages.
This series is offered in 3-pin TO-263, TO-220, TO-252 and SOT-223 package.

Features

- ✧ Low dropout performance 1.3V max.
- ✧ Full current rating over line and temperature.
- ✧ Fast transient response
- ✧ ±2%Total output regulation over line, load and temperature
- ✧ Adjust pin current max 90μA over temperature
- ✧ Line regulation typical 0.015%.
- ✧ Load regulation typical 0.05%.
- ✧ Fixed/adjustable output voltage
- ✧ TO-220, TO-263 TO-252 and SOT-223 package

Block Diagram



Ordering Information

Part No.	Operating Temp. (Ambient)	Package
TS1117CZ-xx	-20 ~ +85 °C	TO-220
TS1117CM-xx		TO-263
TS1117CP-xx		TO-252
TS1117CW-xx		SOT-223

Note: Where xx denotes voltage option, available are 5.0V, 3.3V, 2.5V and 1.8V. Leave blank for adjustable version. Contact factory for additional voltage options.

Absolute Maximum Rating

Input Supply Voltage	Vin	12	V
Operation Input Supply Voltage	Vin (operate)	7	V
Power Dissipation	P_D	Internally Limited	W
Operating Junction Temperature Range	T_J	-25 ~ +150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C
Lead Soldering Temperature (260 °C) TO-220 / TO-263 Package TO-252 / SOT-223 Package		 10 5	S