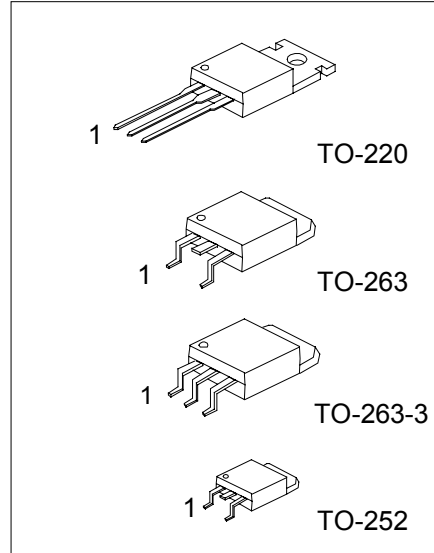# UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

8A,5A,3A LOW DROPOUT POSITIVE REGULATORS ADJUSTABLE AND FIXED

DESCRIPTION

The UTC U584/585/587 voltage regulators are monolithic integrated circuits, designed for use in applications requiring a well regulated positive output voltage with +5V input. The output voltage can be adjustable from 3.8 V down to 1.3V.
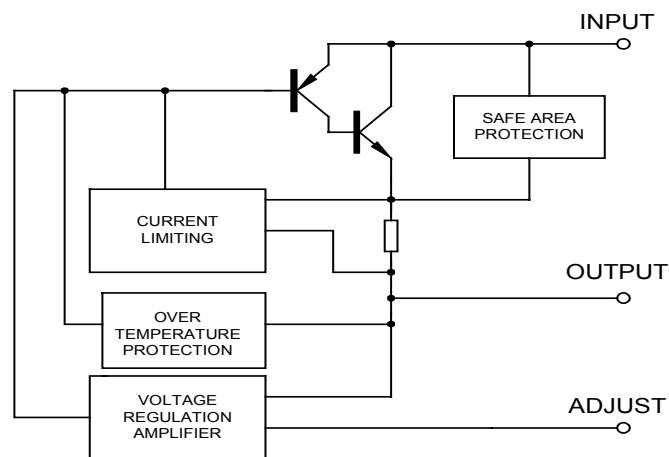
FEATURES

*Low dropout performance.
*Adjustable output down to 1.3V.
*Line regulation typically below   0.1%.
*Load regulation typically below   0.1%.
*Output current can be up to 8 A for UTC U584.
*Three-terminal adjustable or fixed 3.3V.

TO-220

TO-263

TO-263-3

TO-252

1: ADJ/GND   2: OUTPUT   3: INPUT

BLOCK DIAGRAM

INPUT

SAFE AREA PROTECTION

CURRENT LIMITING

OVER TEMPERATURE PROTECTION

VOLTAGE REGULATION AMPLIFIER

OUTPUT

ADJUST

UTC UNISONIC TECHNOLOGIES   CO., LTD.   1

UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Input Voltage	V_{IN}	7	V
Power Dissipation	P_D	Internally Limited	W
Operating Junction Temperature Range	T_J	0 to 125	°C
Storage Temperature	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering 10 Sec.)	T_{LEAD}	300	°C

ELECTRICAL CHARACTERISTICS

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Reference Voltage U584 U585 U587	$1.3V \leq (V_{IN}-V_{OUT}) \leq 3V$, $10mA \leq I_{OUT} \leq 8A$ $1.3V \leq (V_{IN}-V_{OUT}) \leq 3V$, $10mA \leq I_{OUT} \leq 5A$, $1.3V \leq (V_{IN}-V_{OUT}) \leq 3V$, $10mA \leq I_{OUT} \leq 3A$	*	1.225	1.25	1.275	V
Output Voltage U584-3.3 U585-3.3 U587-3.3	$4.75V \leq V_{IN} \leq 6.5V$, $10mA \leq I_{OUT} \leq 8A$ $4.75V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 5A$ $4.75V \leq V_{IN} \leq 7V$, $10mA \leq I_{OUT} \leq 3A$		3.234	3.300	3.366	V
Line Regulation (Note 1.2) U584/5/7 U584/5/7-3.3	$2.75V \leq V_{IN} \leq 7V$, $I_{OUT}= 10mA$ $4.75V \leq V_{IN} \leq 7V$, $I_{OUT}= 0mA$			0.1	0.2	%
Load Regulation (Note 1, 2, 3) U584/5/7 U584/5/7-3.3	$V_{IN}-V_{OUT}=2.5V$.$T_j=25°C$, $10mA <= I_{OUT} <= I_{FULLLOAD}$ $V_{IN}=5V$, $T_j=25°C$, $0mA \leq I_{OUT} \leq I_{FULLLOAD}$	*		0.2	1.0	%
Dropout Voltage	$\triangle V_{REF}=1\%$,$I_{OUT}= I_{FULLLOAD}$ $T_j >=25°C$ $T_j <=25°C$			1.2 1.2	1.3 1.35	V V
Current Limit (Note 3) U584 U585 U587	$V_{IN}-V_{OUT} =3 V$ $V_{IN}-V_{OUT} =3 V$ $V_{IN}-V_{OUT} =3 V$	*	8.0 5.0 3.0	8.5 5.5 3.6		A
Adjust Pin Current				55	120	μA
Adjust Pin Current Change (Note 3)	$1.5V <= (V_{IN}-V_{OUT}) <=3 V$, $10mA <= I_{OUT} <= I_{FULLLOAD}$			0.2	5	mA
Minimum Load Current	$1.5V <= (V_{IN}-V_{OUT}) <=3V$	*		2	10	mA
Quiescent Circuit Current	$V_{IN} <=5V$	*		8	13	mA
Ripple Rejection	$f=120Hz$, $C_{OUT}=25\mu ATant$, $V_{IN}-V_{OUT} =2.5V$, $I_{OUT}= I_{FULLLOAD}$		60	72		dB
Temperature Stability				0.5		%
Long-Term Stability	$T_A=25°C$, 1000Hrs			0.03	1.0	%
RMS Output Noise (% of V_{OUT})	$T_A=125°C$, $10Hz <= f <=10kHz$			0.03		%
Thermal Resistance Junction to Case U584 U587					1.6 3.0	°C /W
Thermal Resistance Junction to A_{MBIENT}, θ_{JA} U585					60	°C /W
Thermal Resistance Junction to T_{AB}, θ_{JT} U585					2.7	°C /W

UTC UNISONIC TECHNOLOGIES   CO., LTD.   2
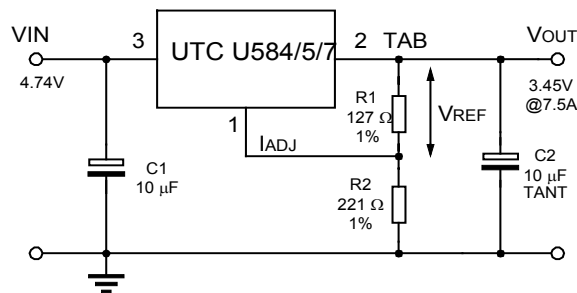
UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

The * denotes specifications which apply over the specified operating temperature range.

Note 1:   Load and line regulation are measured at a constant junction temperature by low duty cycle pulse testing.

Note 2: Line and load regulation are guaranteed up to the maximum power dissipation (15W for the UTC U584, 10W for the UTC U585). Power dissipation is determined by input / output differential and the output current. Guaranteed maximum output power will not be available over the full input-output voltage range.

Note 3: $I_{FULLLOAD}$ is defined as the maximum value of output load current as a function of input-to-output voltage. Output current can be different for different input-to-output voltage.

APPLICATION CIRCUIT (ADJUSTABLE)

REQUIRED FOR STABILITY

$$V_{OUT}=V_{REF}*(1+R2/R1)+I_{ADJ}*R2$$

APPLICATION CIRCUIT (3.3V)
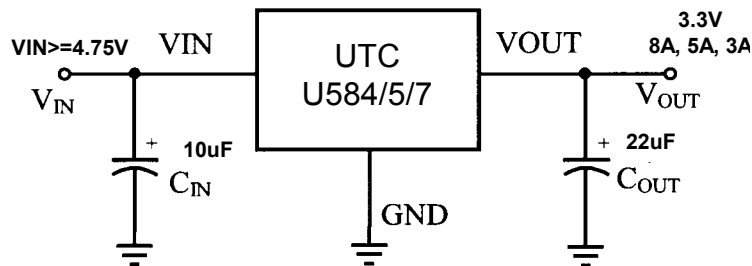
UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

TYPICAL PERFORMANCE CHARACTERISTICS

U584
Dropout Voltage

U584
Short-Circut Current

U584
Load Regulation

U585
Dropout Voltage

U585
Short-Circuit Current

U585
Load Regulation

U587
Dropout Voltage

U587
Short-Circut Current

U587
Load Regulation

UTC   UNISONIC TECHNOLOGIES   CO., LTD.   4
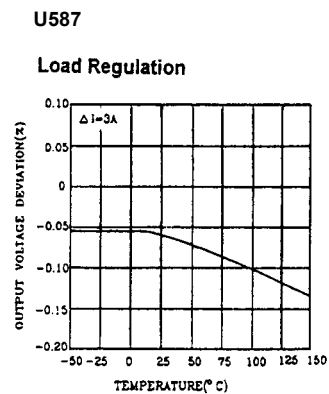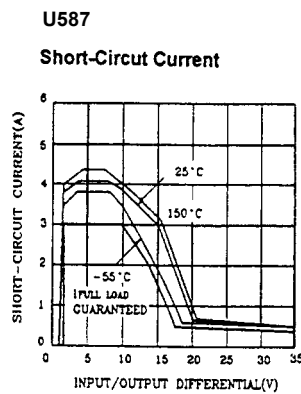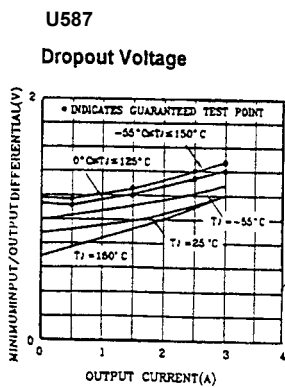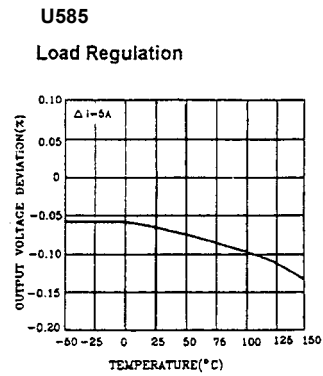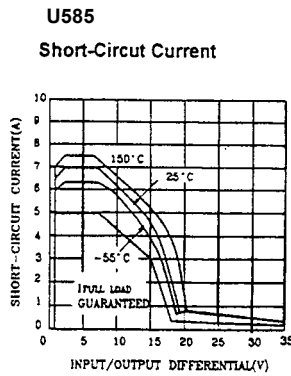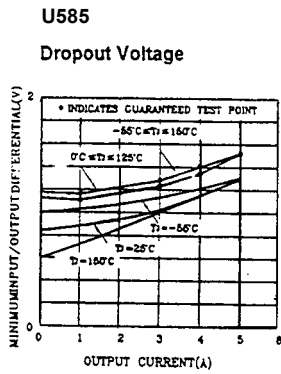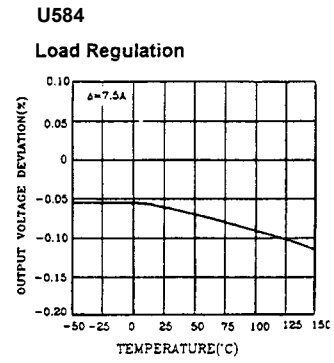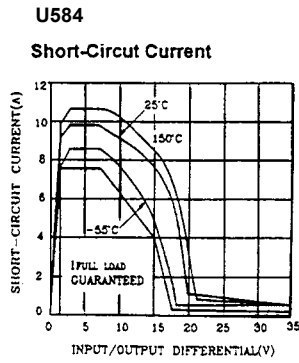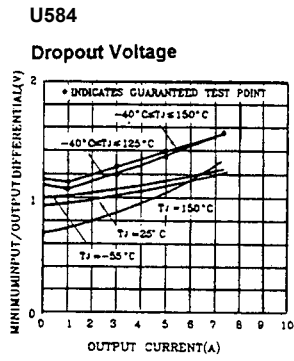
UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

Minimum Operating Current
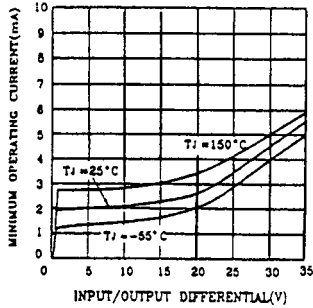
Temperature Stability
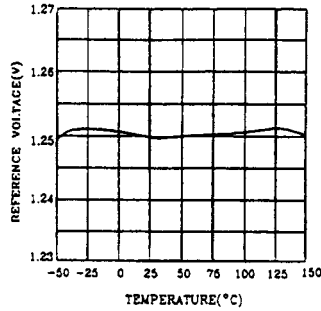
Adjust Pin Current
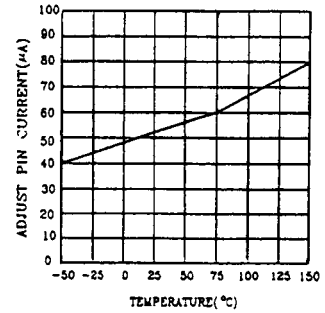
U584

Ripple Rejection
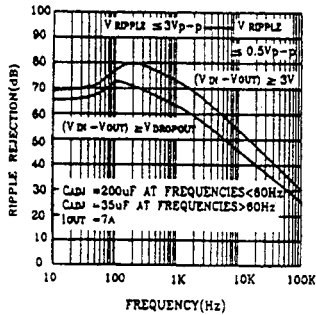
U584

Ripple Rejection vs Current
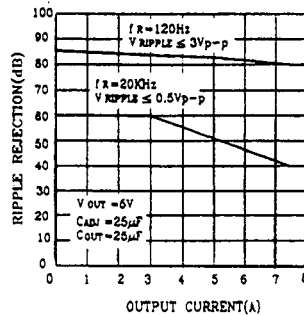
U584

Maximum Power Dissipation*
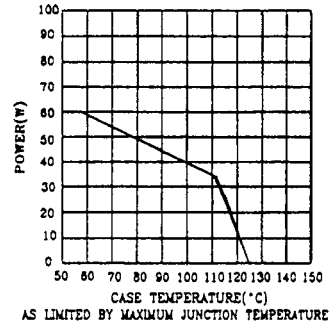
U585

Ripple Rejection
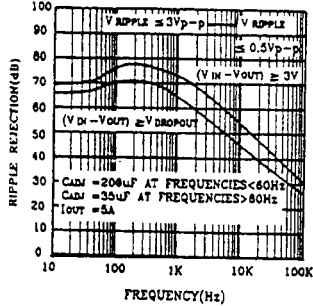
U585

Ripple Rejection vs Current
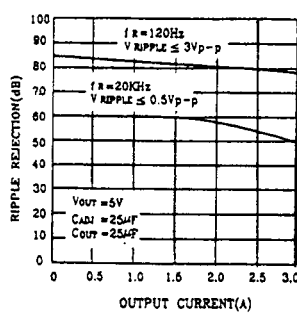
U585

Maximum Power Dissipation

UTC   UNISONIC TECHNOLOGIES   CO., LTD.   5
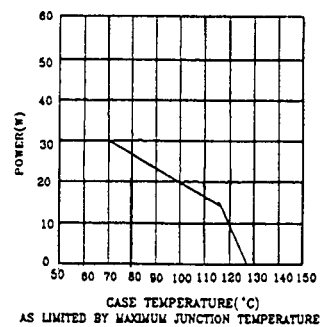
UTC U584/5/7 LINEAR INTEGRATED CIRCUIT

U587
Ripple Rejection
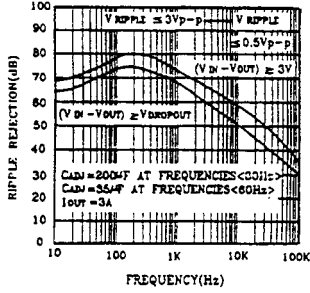
U587
Ripple Rejection vs Current
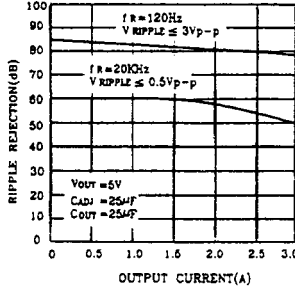
U587
Maximum Power Dissipation
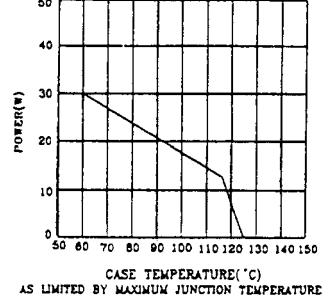
U584
Load Transient Response
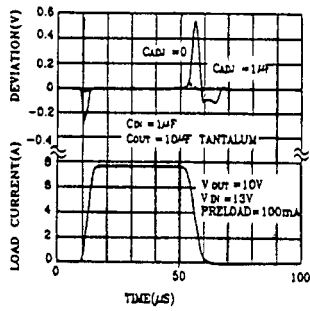
U585
Load Transient Response
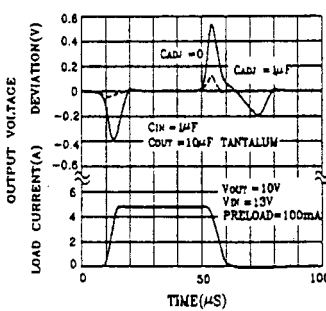
U587
Load Transient Response
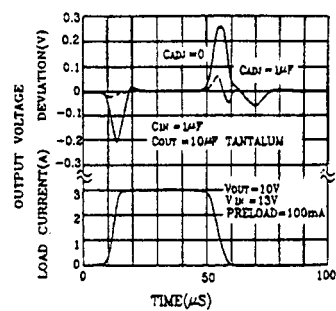
U584
Line Transient Response
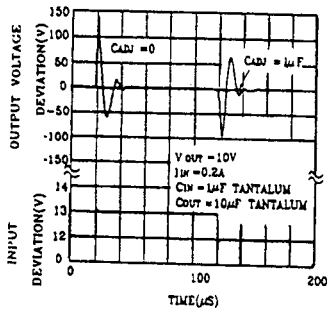
U585
Line Transient Response
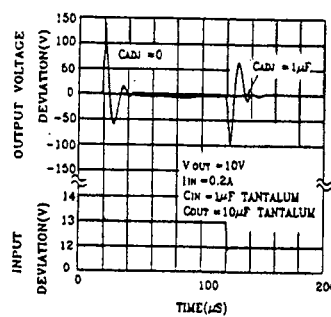
U587
Line Transient Response

UTC UNISONIC TECHNOLOGIES CO., LTD. 6

UTC U584/5/7   LINEAR INTEGRATED CIRCUIT

UTC   UNISONIC TECHNOLOGIES   CO., LTD.   7