

## 800mA Adjustable Low-Dropout Linear Regulator

### Features

- Available in Adjust Version
- Space Saving SOT-89 Package
- Internal Short Circuit Current Limiting
- Internal Over Temperature Protection
- Current limit in Excess of 800mA

### Applications

- Post Regulation for Switching DC/DC Converter
- Voltage Regulator for CD-ROM Driver
- Voltage Regulator for LAN Card
- Battery Powered Instrumentation
- Motherboard

### General Description

The G958 is a low dropout linear regulator with a dropout of 1.2V at 500mA of load current. It is available in an adjustable version, which can set the output from 1.25V to 5V with only two external resistors.

The G958 provides over temperature and over current protection circuits to prevent it from being damaged by abnormal operating conditions.

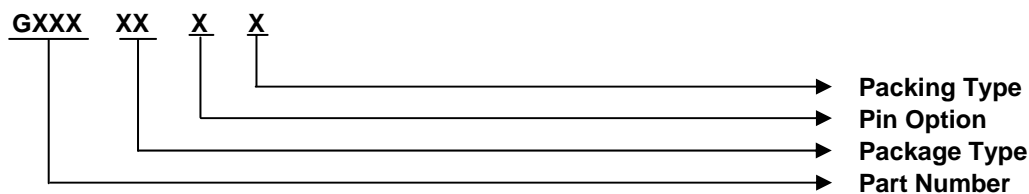
The G958 is available in SOT-89 packages. A minimum of 10 $\mu$ F tantalum electrolytic capacitor is required at the output to improve the transient response and stability.

### Ordering Information

ORDER NUMBER	MARKING	TEMP. RANGE	PACKAGE (Pb free)	PIN OPTION		
				1	2	3
G958T23U	958 3xx	-40°C~85°C	SOT-89	GND/ADJ	V <sub>OUT</sub>	V <sub>IN</sub>
G958T24U	958 4xx	-40°C~85°C	SOT-89	GND/ADJ	V <sub>IN</sub>	V <sub>OUT</sub>

\* For other package types and pin options, please contact us at sales @gmt.com.tw

### Order Number Identification



#### PACKAGE TYPE

T2: SOT-89

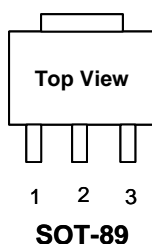
#### PIN OPTION

<b>1</b>	<b>2</b>	<b>3</b>
3: GND/ADJ	V <sub>OUT</sub>	V <sub>IN</sub>
4: GND/ADJ	V <sub>IN</sub>	V <sub>OUT</sub>

#### PACKING

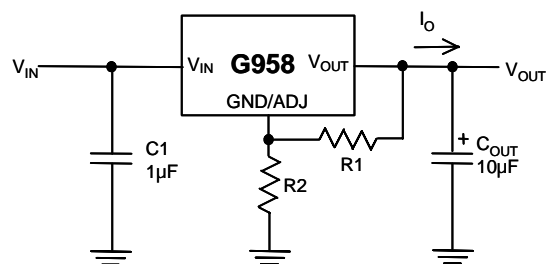
U: Tape & Reel

### Package Type



### Typical Application Circuit

[Note 4]: Type of C<sub>OUT</sub>





<b>Absolute Maximum Ratings</b>	(Note 1)
Input Voltage	7V
Power Dissipation Internally Limited	(Note 2)
Maximum Junction Temperature	150°C
Reflow Temperature (soldering, 10sec)	260°C
Thermal Resistance Junction to Ambient, ( $\theta_{JA}$ )	
SOT-89	126°C/W
Thermal Resistance Junction to Case, ( $\theta_{JC}$ )	
SOT-89	29°C/W

<b>Operating Conditions</b>	(Note 1)
( $V_{IN}-V_{ADJ}$ ) Voltage	2.5V~6.5V
Temperature Range	-40°C ≤ $T_A$ ≤ 85°C

## Electrical Characteristics

Operating Conditions:  $V_{IN} \leq 6.5V$ ,  $T_J = 25^\circ C$  unless otherwise specified. [Note3]

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Reference Voltage	$V_{IN} - V_{OUT} = 2V$ , $I_{OUT} = 10mA$	1.225	1.250	1.275	V
Line Regulation	$(V_{OUT} + 1.5V) \leq V_{IN} \leq 6.5V$ , $I_{OUT} = 10mA$	---	1.32	---	%
Load Regulation	$(V_{IN} - V_{OUT}) = 2V$ , $10mA \leq I_{OUT} \leq 0.5A$	---	0.04	---	%
Dropout Voltage	$\Delta V_{OUT} = 2\%$ , $I_{OUT} = 0.5A$	---	1.2	1.3	V
Current Limit	$(V_{IN} - V_{OUT}) = 2V$	800	1200	---	mA
Adjust Pin Current Change	$V_{IN} - V_{OUT} = 2V$ , $10mA \leq I_{OUT} \leq 0.5A$	---	0.15	---	$\mu A$
Minimum Load Current	$1.5V \leq (V_{IN} - V_{OUT}) \leq 5.25V$	10	---	---	mA
Quiescent Current	$V_{IN} - V_{OUT} = 2V$	---	80	---	$\mu A$
Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 10\mu F$ Tantalum, $(V_{IN} - V_{OUT}) = 3V$ , $I_{OUT} = 100mA$	---	50	---	dB
Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse	---	0.004	0.02	%/W
Temperature Stability	$V_{IN} = 4V$ , $I_O = 10mA$	---	0.3	---	%
RMS Output Noise (% of $V_{OUT}$ )	$T_A = 25^\circ C$ , $10Hz \leq f \leq 10kHz$ , $I_{LOAD} = 10mA$	---	0.007	---	%
Thermal Resistor Junction-to-Ambient (No heat sink; No air flow)	SOT-89; Recommended Minimum Footprint	---	180	---	$^\circ C/W$
Thermal Shutdown	Junction Temperature	---	150	---	$^\circ C$
Thermal Shutdown Hysteresis		---	10	---	$^\circ C$

**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

**Note2:** The maximum power dissipation is a function of the maximum junction temperature,  $T_{Jmax}$ ; total thermal resistance,  $\theta_{JA}$ , and ambient temperature  $T_A$ . The maximum allowable power dissipation at any ambient temperature is  $T_{Jmax}-T_A / \theta_{JA}$ . If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown. For the G958 in SOT-89 package;  $\theta_{JA}$  is 126°C/W (See Recommend Minimum Footprint). The safe operation in SOT-89 package, it can see "Typical Performance Characteristics" (Safe Operating Area).

**Note3:** Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

**Note4:** The type of output capacitor should be tantalum or aluminum.



## Definitions

### Output Voltage

The G958 provides an adjustable output voltage from 1.25V to 5V. With two external resistors. It can be formulated as:

$$V_{OUT} = 1.25V \times \left(1 + \frac{R_2}{R_1}\right) + I_{ADJ} \times R_2$$

$$I_{ADJ} = 80\mu A \text{ (TYP)}$$

### Dropout Voltage

The input/output Voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 2% below its nominal value. Dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

### Line Regulation

The change in output voltage for a change in input

voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

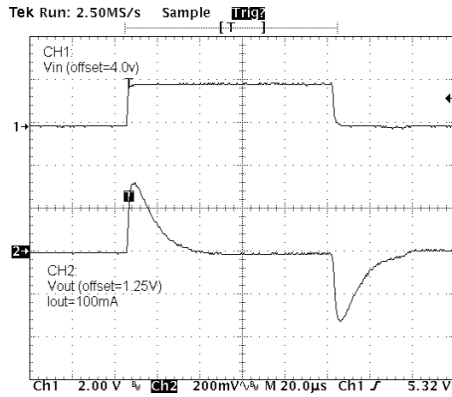
### Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

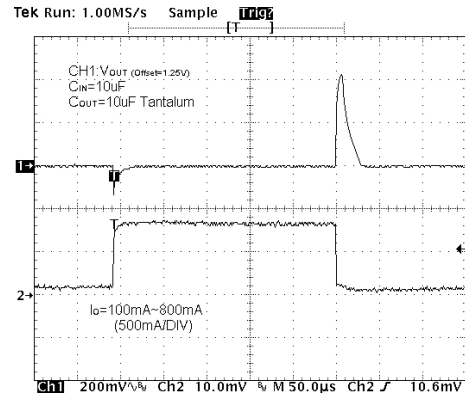
**Typical Performance Characteristics**

$V_{IN} = 4V$ ,  $C_{IN} = 10\mu F$ ,  $C_{OUT} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

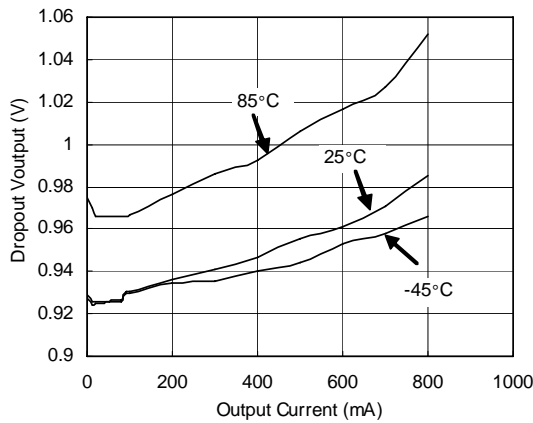
**Line transient**



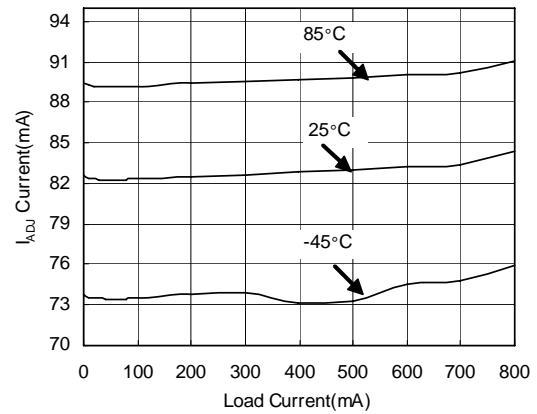
**Load Transient**



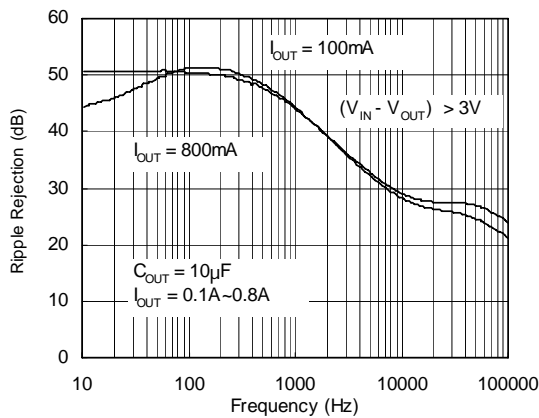
**Dropout Voltage vs. Load Current**



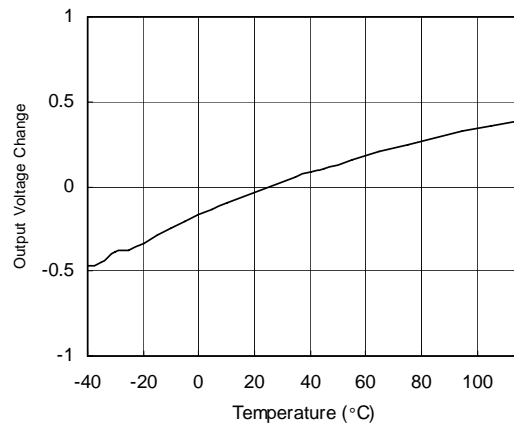
**I<sub>ADJ</sub> Current vs. Load Current**



**Ripple Rejection**



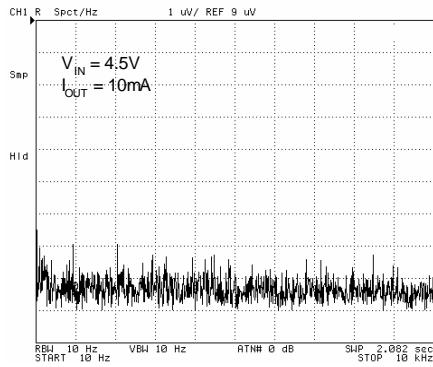
**Temperature Stability**



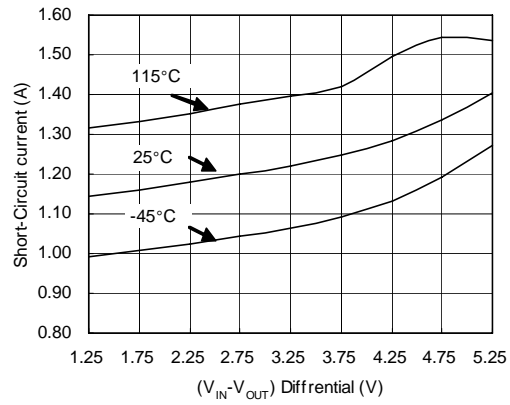


Typical Performance Characteristics (continued)

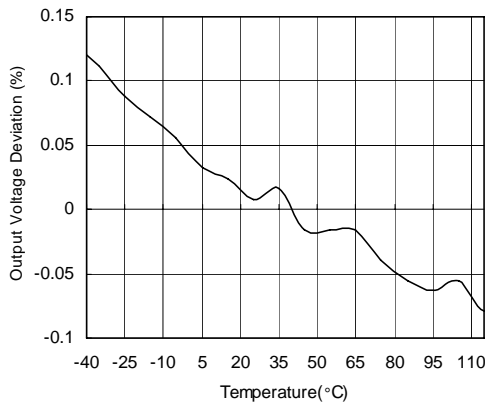
Output Noise



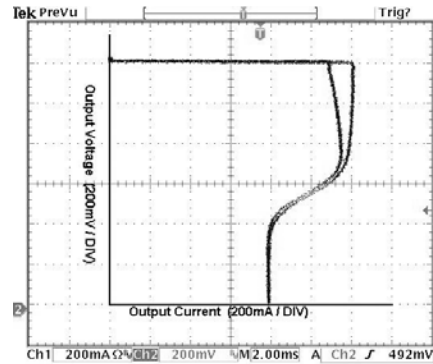
Short-Circuit Current



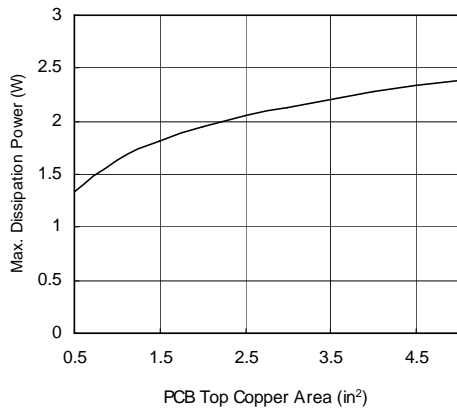
Load Regulation



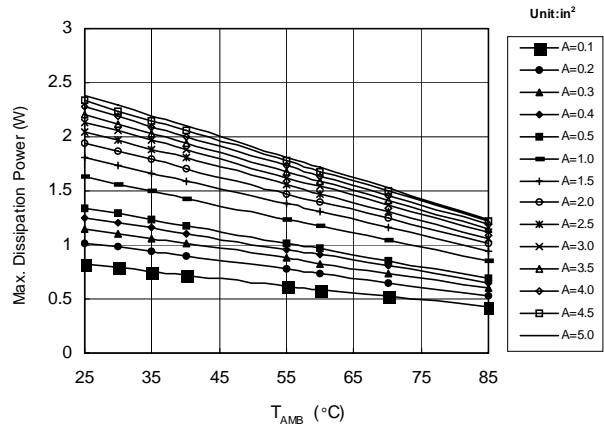
Overcurrent Protection Characteristics



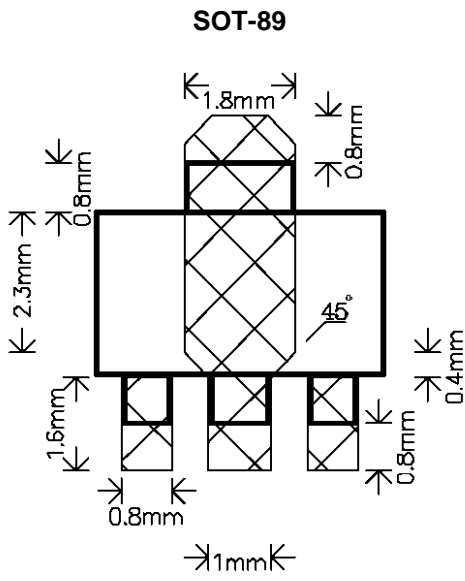
SOT-89 Max. Power Dissipation vs. PCB Top Copper Area



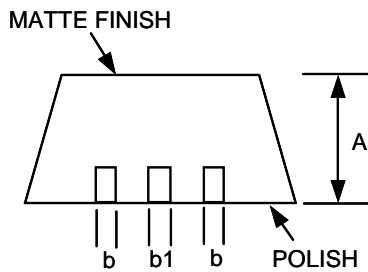
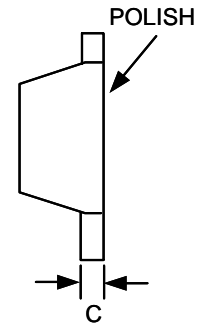
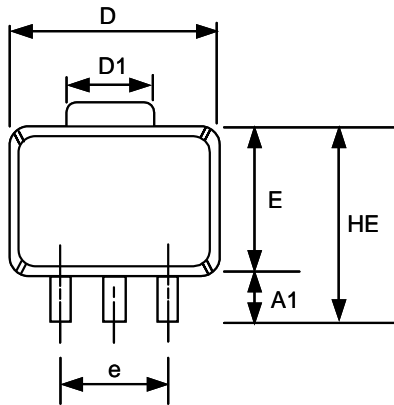
SOT-89 Max. Power Dissipation vs. T<sub>AMB</sub>



Recommend Minimum Footprint



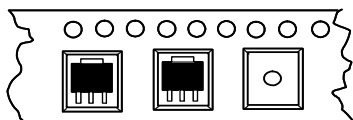
Package Information



SOT-89 (T2) Package

SYMBOL	DIMENSIONS IN MILLIMETER			DIMENSIONS IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
A1	0.80	1.04	-----	0.031	0.041	-----
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
HE	-----	-----	4.25	-----	-----	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e	2.90	3.00	3.10	0.114	0.118	0.122

Package Specification



PACKAGE	Q'TY/REEL
SOT-89	1,000 ea

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