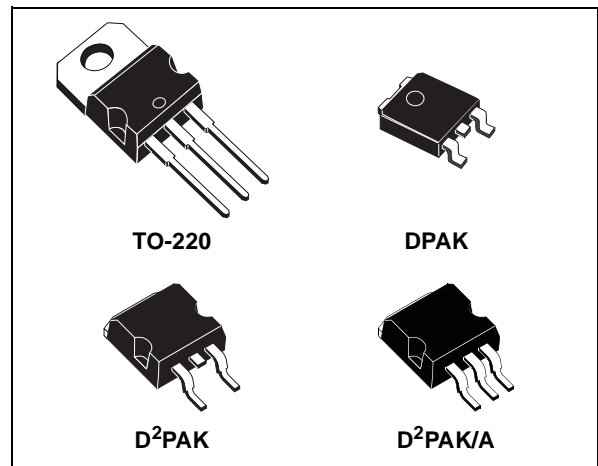




# LD1086 SERIES

## 1.5A LOW DROP POSITIVE VOLTAGE REGULATOR ADJUSTABLE AND FIXED

- TYPICAL DROPOUT 1.3V AT 1.5A
- THREE TERMINAL ADJUSTABLE OR FIXED OUTPUT VOLTAGE 1.2V, 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5V, 8V, 9V, 12V.
- GUARANTEED OUTPUT CURRENT UP TO 1.5A
- OUTPUT TOLERANCE  $\pm 1\%$  AT 25°C AND  $\pm 2\%$  IN FULL TEMPERATURE RANGE
- INTERNAL POWER AND THERMAL LIMIT
- WIDE OPERATING TEMPERATURE RANGE -40°C TO 125°C
- PACKAGE AVAILABLE : TO-220, D<sup>2</sup>PAK, D<sup>2</sup>PAK/A, DPAK
- PINOUT COMPATIBILITY WITH STANDARD ADJUSTABLE VREG

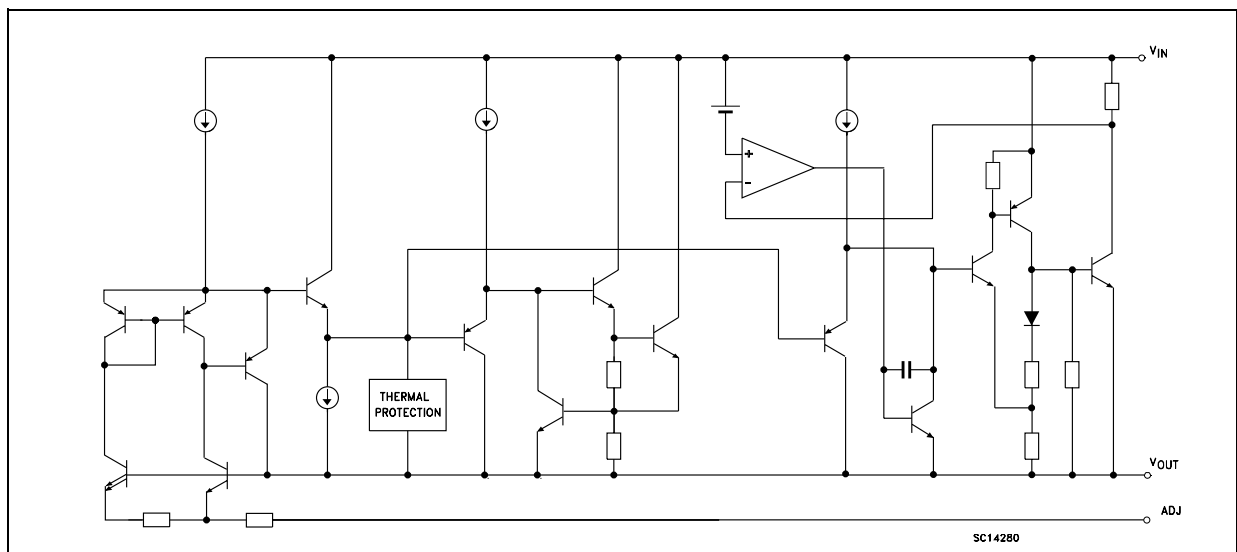


### DESCRIPTION

The LD1086 is a LOW DROP Voltage Regulator able to provide up to 1.5A of Output Current. Dropout is guaranteed at a maximum of 1.2V at the maximum output current, decreasing at lower loads. The LD1086 is pin to pin compatible with the older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance .

A 2.85V output version is suitable for SCSI-2 active termination. Unlike PNP regulators, where a part of the output current is wasted as quiescent current, the LD1086 quiescent current flows into the load, so increase efficiency. Only a 10 $\mu$ F minimum capacitor is need for stability. The device is supplied in TO-220, D<sup>2</sup>PAK, D<sup>2</sup>PAK/A and DPAK. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 1\%$  at 25°C.

### SCHEMATIC DIAGRAM



## LD1086 SERIES

### ABSOLUTE MAXIMUM RATINGS

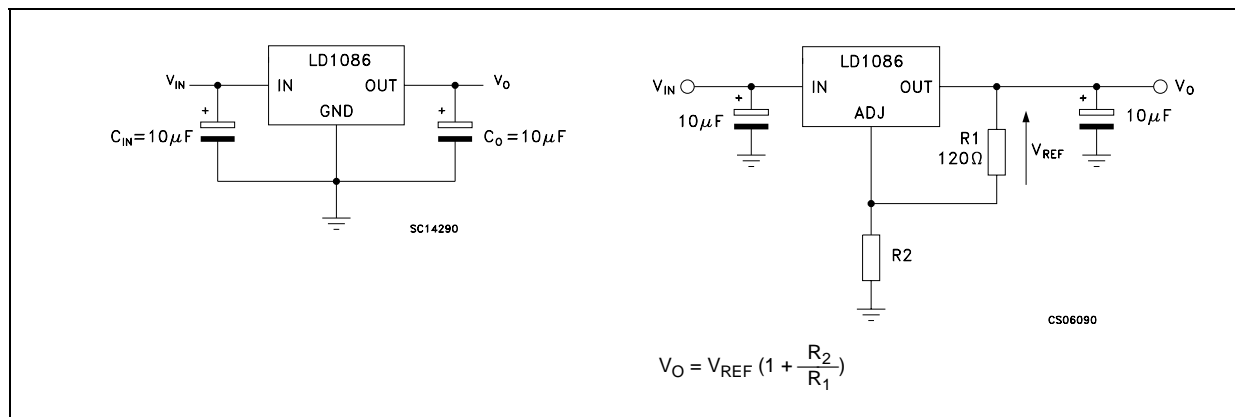
Symbol	Parameter <sup>2</sup>	Value	Unit
$V_I$	DC Input Voltage	30	V
$I_O$	Output Current	Internally Limited	mA
$P_D$	Power Dissipation	Internally Limited	mW
$T_{stg}$	Storage Temperature Range	-55 to +150	°C
$T_{op}$	Operating Junction Temperature Range	-40 to +125	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

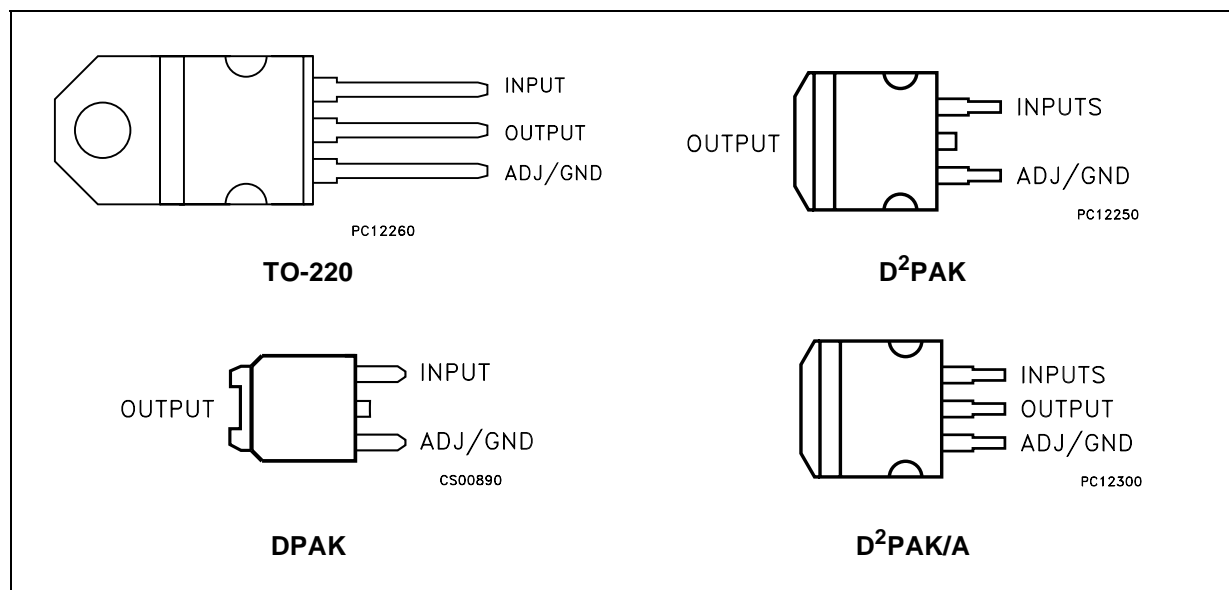
### THERMAL DATA

Symbol	Parameter	TO-220	D <sup>2</sup> PAK	DPAK	Unit
$R_{thj-case}$	Thermal Resistance Junction-case	3	3	8	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	50	62.5		°C/W

### APPLICATION CIRCUITS



## CONNECTION DIAGRAM (top view)



## ORDERING CODES

TO-220	D <sup>2</sup> PAK (*)	D <sup>2</sup> PAK/A (*)	DPAK (*)	OUTPUT VOLTAGE
LD1086V12	LD1086D2T12	LD1086D2M12	LD1086DT12	1.2 V
LD1086V15	LD1086D2T15	LD1086D2M15	LD1086DT15	1.5 V
LD1086V18	LD1086D2T18	LD1086D2M18	LD1086DT18	1.8 V
LD1086V25	LD1086D2T25	LD1086D2M25	LD1086DT25	2.5 V
LD1086V28	LD1086D2T28	LD1086D2M28	LD1086DT28	2.85 V
LD1086V33	LD1086D2T33	LD1086D2M33	LD1086DT33	3.3 V
LD1086V36	LD1086D2T36	LD1086D2M36	LD1086DT36	3.6 V
LD1086V50	LD1086D2T50	LD1086D2M50	LD1086DT50	5.0 V
LD1086V80	LD1086D2T80	LD1086D2M80	LD1086DT80	8.0 V
LD1086V90	LD1086D2T90	LD1086D2M90	LD1086DT90	9.0 V
LD1086V12	LD1086D2T12	LD1086D2M12	LD1086DT12	12.0 V
LD1086V	LD1086D2T	LD1086D2M	LD1086DT	ADJ

(\*) Available in Tape &amp; Reel with the suffix "TR".

## LD1086 SERIES

**ELECTRICAL CHARACTERISTICS OF LD1086#12** ( $V_I=4.5V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	1.485	1.5	1.515	V
		$I_O = 0$ to $1.5A$ $V_I = 3.4$ to $30V$	1.47	1.5	1.53	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 3.1$ to $18V$ $T_J = 25^\circ C$		0.2	4	mV
		$I_O = 0\text{ mA}$ $V_I = 3.1$ to $15V$		0.4	4	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		0.5	8	mV
		$I_O = 0$ to $1.5A$		1	16	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.02		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 6.5 \pm 3V$	60	82		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#15** ( $V_I=4.5V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	1.485	1.5	1.515	V
		$I_O = 0$ to $1.5A$ $V_I = 3.4$ to $30V$	1.47	1.5	1.53	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 3.1$ to $18V$ $T_J = 25^\circ C$		0.2	4	mV
		$I_O = 0\text{ mA}$ $V_I = 3.1$ to $15V$		0.4	4	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		0.5	8	mV
		$I_O = 0$ to $1.5A$		1	16	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.02		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 6.5 \pm 3V$	60	82		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#18** ( $V_I=4.8V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	1.782	1.8	1.818	V
		$I_O = 0$ to $1.5A$ $V_I = 3.4$ to $30V$	1.764	1.8	1.836	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 3.4$ to $18V$ $T_J = 25^\circ C$		0.2	4	mV
		$I_O = 0\text{ mA}$ $V_I = 3.4$ to $15V$		0.4	4	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		0.5	8	mV
		$I_O = 0$ to $1.5A$		1	16	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.02		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 6.8 \pm 3V$	60	82		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#25** ( $V_I=5.5V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	2.475	2.5	2.525	V
		$I_O = 0$ to $1.5A$ $V_I = 4.1$ to $30V$	2.45	2.5	2.55	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 4.1$ to $18V$ $T_J = 25^\circ C$		0.2	4	mV
		$I_O = 0\text{ mA}$ $V_I = 4.1$ to $18V$		0.4	4	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		0.5	8	mV
		$I_O = 0$ to $1.5A$		1	16	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.008	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 7.5 \pm 3V$	60	81		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

## LD1086 SERIES

**ELECTRICAL CHARACTERISTICS OF LD1086#285** ( $V_I=5.85V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0 \text{ mA}$ $T_J = 25^\circ C$	2.821	2.85	2.879	V
		$I_O = 0$ to $1.5A$ $V_I = 4.5$ to $30V$	2.793	2.85	2.907	V
$\Delta V_O$	Line Regulation	$I_O = 0 \text{ mA}$ $V_I = 4.5$ to $18V$ $T_J = 25^\circ C$		0.2	6	mV
		$I_O = 0 \text{ mA}$ $V_I = 4.5$ to $18V$		0.5	6	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		1	12	mV
		$I_O = 0$ to $1.5A$		2	20	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 1.5A$ $V_I = 7.85 \pm 3V$	60	80		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#33** ( $V_I=6.3V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0 \text{ mA}$ $T_J = 25^\circ C$	3.267	3.3	3.333	V
		$I_O = 0$ to $1.5A$ $V_I = 4.9$ to $30V$	3.234	3.35	3.366	V
$\Delta V_O$	Line Regulation	$I_O = 0 \text{ mA}$ $V_I = 4.9$ to $18V$ $T_J = 25^\circ C$		0.5	6	mV
		$I_O = 0 \text{ mA}$ $V_I = 4.9$ to $18V$		1	6	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		1	10	mV
		$I_O = 0$ to $1.5A$		7	25	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.008	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 1.5A$ $V_I = 8.3 \pm 3V$	60	79		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#36** ( $V_I=6.6V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0 \text{ mA}$ $T_J = 25^\circ C$	3.564	3.6	3.636	V
		$I_O = 0$ to $1.5A$ $V_I = 5.2$ to $30V$	3.528	3.6	3.672	V
$\Delta V_O$	Line Regulation	$I_O = 0 \text{ mA}$ $V_I = 5.2$ to $18V$ $T_J = 25^\circ C$		0.5	10	mV
		$I_O = 0 \text{ mA}$ $V_I = 5.2$ to $18V$		1	10	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		3	15	mV
		$I_O = 0$ to $1.5A$		7	25	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 1.5A$ $V_I = 8.6 \pm 3V$	60	78		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#50** ( $V_I=8V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0 \text{ mA}$ $T_J = 25^\circ C$	4.95	5	5.05	V
		$I_O = 0$ to $1.5A$ $V_I = 6.6$ to $30V$	4.9	5	5.1	V
$\Delta V_O$	Line Regulation	$I_O = 0 \text{ mA}$ $V_I = 6.6$ to $20V$ $T_J = 25^\circ C$		0.5	10	mV
		$I_O = 0 \text{ mA}$ $V_I = 6.6$ to $20V$		1	10	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		5	20	mV
		$I_O = 0$ to $1.5A$		10	35	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 1.5A$ $V_I = 10 \pm 3V$	60	75		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

## LD1086 SERIES

**ELECTRICAL CHARACTERISTICS OF LD1086#80** ( $V_I=11V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	7.92	8	8.08	V
		$I_O = 0$ to $1.5A$ $V_I = 9.8$ to $30V$	7.84	8	8.16	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 9.8$ to $20V$ $T_J = 25^\circ C$		1	18	mV
		$I_O = 0\text{ mA}$ $V_I = 9.8$ to $20V$		2	18	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		8	30	mV
		$I_O = 0$ to $1.5A$		12	60	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.04	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 13 \pm 3V$	54	71		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1086#90** ( $V_I=12V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0\text{ mA}$ $T_J = 25^\circ C$	8.91	9	9.09	V
		$I_O = 0$ to $1.5A$ $V_I = 11$ to $30V$	8.82	9	9.18	V
$\Delta V_O$	Line Regulation	$I_O = 0\text{ mA}$ $V_I = 11$ to $20V$ $T_J = 25^\circ C$		1	20	mV
		$I_O = 0\text{ mA}$ $V_I = 11$ to $20V$		2	20	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		8	30	mV
		$I_O = 0$ to $1.5A$		12	60	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120\text{ Hz}$ , $C_O = 25\mu F$ , $I_O = 1.5A$ $V_I = 14 \pm 3V$	54	70		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.



**ELECTRICAL CHARACTERISTICS OF LD1086#120** ( $V_I=15V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 0 \text{ mA}$ $T_J = 25^\circ C$	11.88	12	12.12	V
		$I_O = 0$ to $1.5A$ $V_I = 13.8$ to $30V$	11.76	12	12.24	V
$\Delta V_O$	Line Regulation	$I_O = 0 \text{ mA}$ $V_I = 13.8$ to $25V$ $T_J = 25^\circ C$		1	25	mV
		$I_O = 0 \text{ mA}$ $V_I = 13.8$ to $25V$		2	25	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $1.5A$ $T_J = 25^\circ C$		12	36	mV
		$I_O = 0$ to $1.5A$		24	72	V
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 1.5A$ $V_I = 17 \pm 3V$	54	66		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

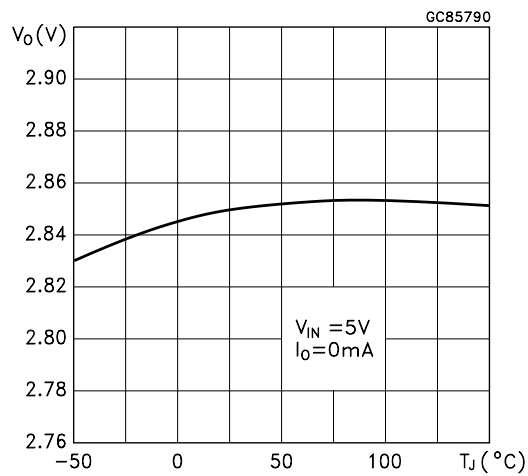
**ELECTRICAL CHARACTERISTICS OF LD1086#** ( $V_I=4.25V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage (note 1)	$I_O = 10\text{mA}$ $T_J = 25^\circ C$	1.237	1.25	1.263	V
		$I_O = 10\text{mA}$ to $1.5A$ $V_I = 2.85$ to $30V$	1.225	1.25	1.275	V
$\Delta V_O$	Line Regulation	$I_O = 10\text{mA}$ $V_I = 2.8$ to $16.5V$ $T_J = 25^\circ C$		0.015	0.2	%
		$I_O = 10\text{mA}$ $V_I = 2.8$ to $16.5V$		0.035	0.2	%
$\Delta V_O$	Load Regulation	$I_O = 10\text{mA}$ to $1.5A$ $T_J = 25^\circ C$		0.1	0.3	%
		$I_O = 0$ to $1.5A$		0.2	0.4	%
$V_d$	Dropout Voltage	$I_O = 1.5A$		1.3	1.5	V
$I_{O(\min)}$	Minimum Load Current	$V_I = 30V$		3	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	1.5	2.3		A
		$V_I - V_O = 25V$	0.05	0.2		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $C_{ADJ} = 25 \mu F$ , $I_O = 1.5A$ $V_I = 6.25 \pm 3V$	60	88		dB
$I_{ADJ}$	Adjust Pin Current	$V_I = 4.25V$ $I_O = 10 \text{ mA}$		40	120	$\mu A$
$\Delta I_{ADJ}$	Adjust Pin Current Change	$I_O = 10\text{mA}$ to $1.5A$ $V_I = 2.8$ to $16.5V$ (note 1)		0.2	5	$\mu A$
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ 1000Hrs		0.5		%

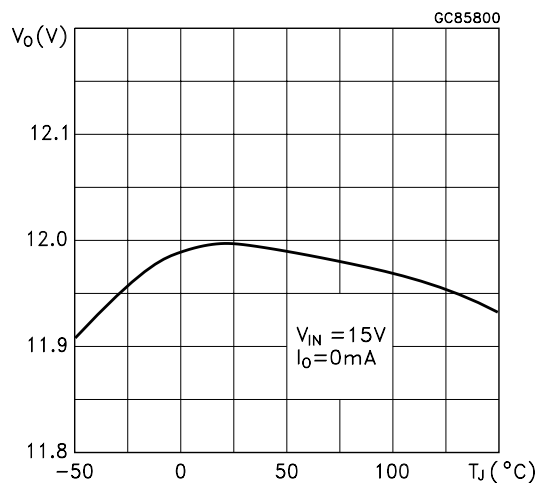
NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**TYPICAL CHARACTERISTICS** (unless otherwise specified  $T_J = 25^\circ\text{C}$ ,  $C_I=C_O=10\mu\text{F}$ )

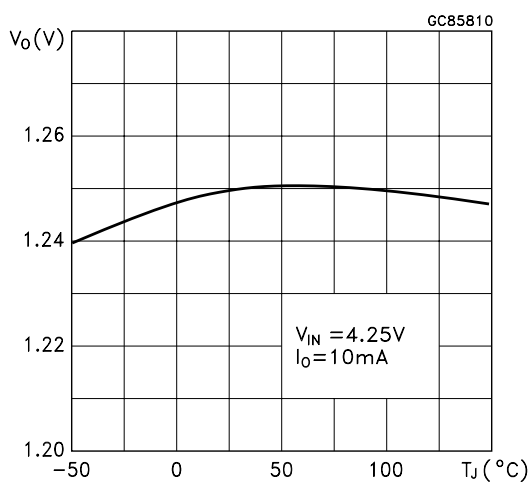
**Figure 1 : Output Voltage vs Temperature**



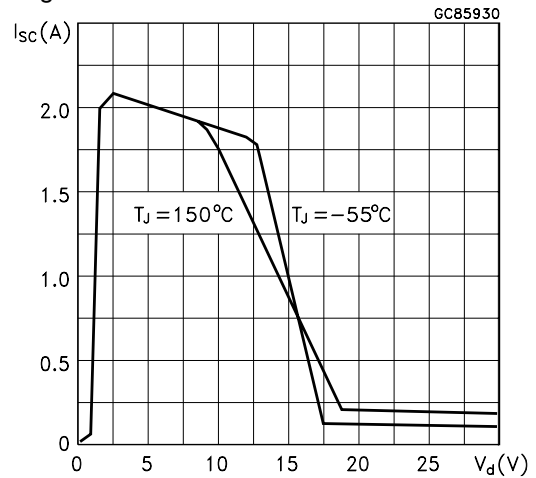
**Figure 2 : Output Voltage vs Temperature**



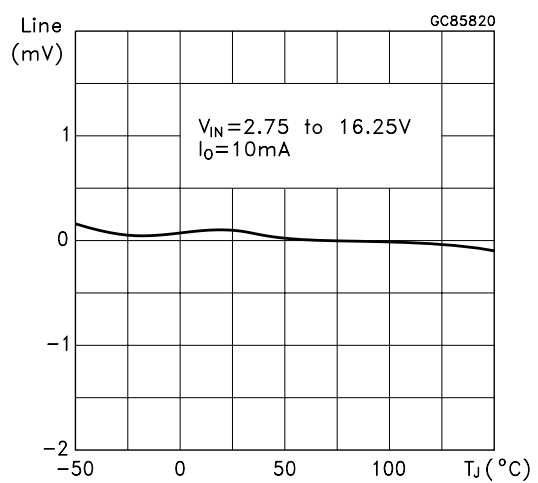
**Figure 3 : Output Voltage vs Temperature**



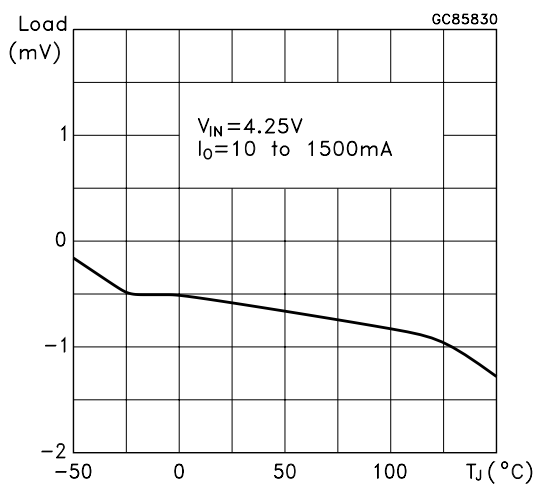
**Figure 4 : Short Circuit Current vs Dropout Voltage**

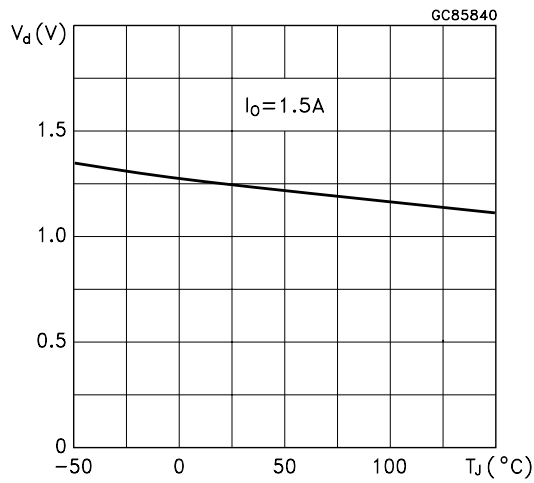
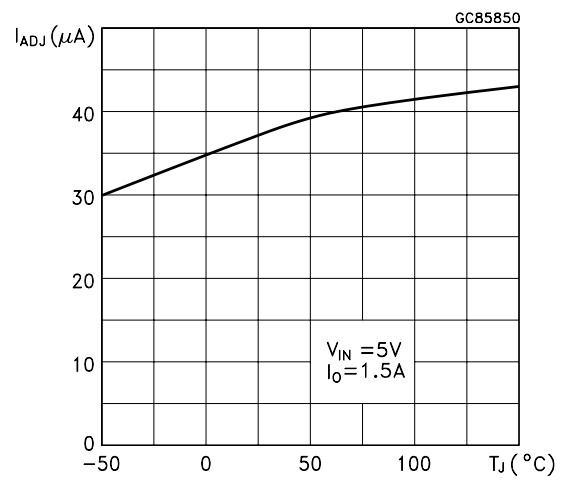
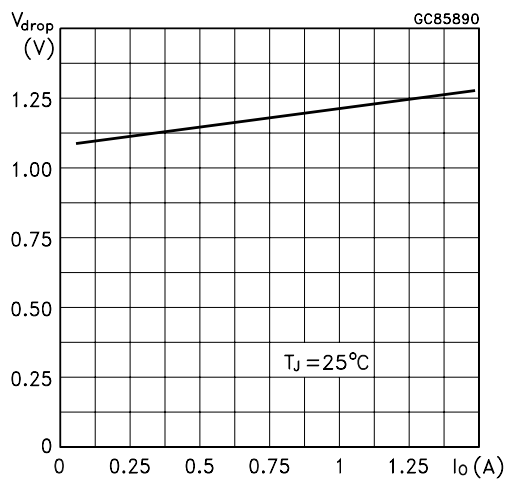
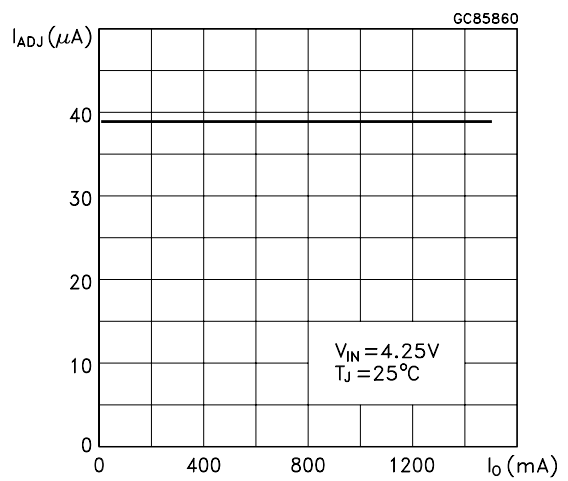
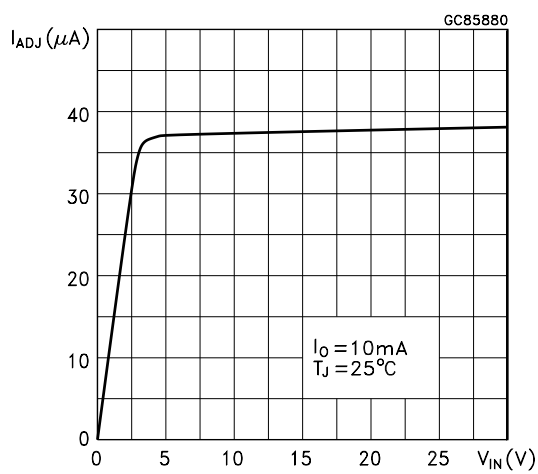
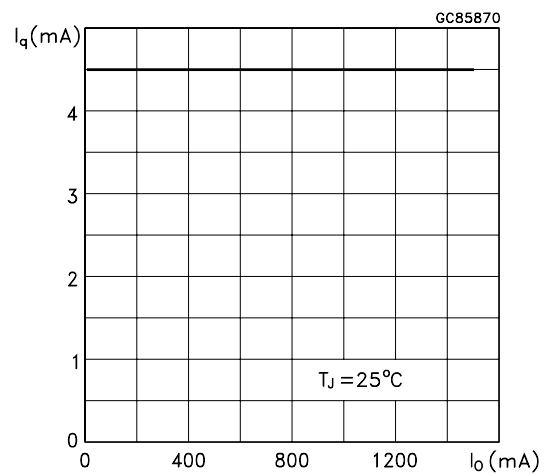


**Figure 5 : Line Regulation vs Temperature**

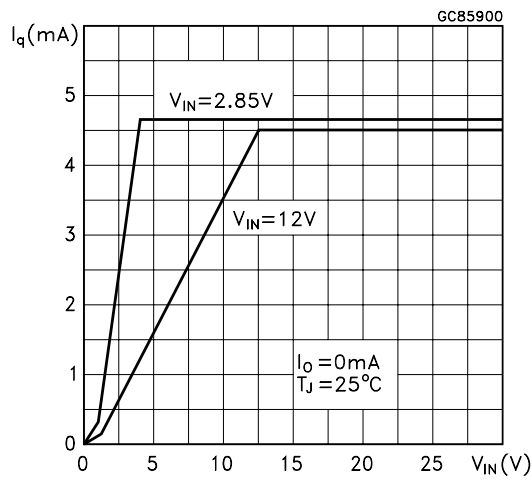


**Figure 6 : Load Regulation vs Temperature**

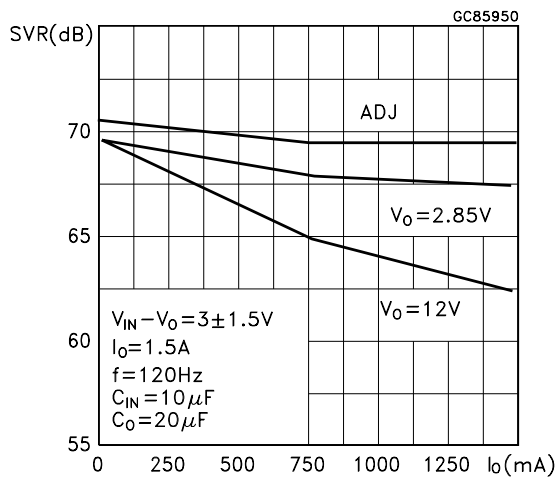


**Figure 7 : Dropout Voltage vs Temperature****Figure 10 : Adjust Pin Current vs Temperature****Figure 8 : Dropout Voltage vs Output Current****Figure 11 : Adjust Pin Current vs Output Current****Figure 9 : Adjust Pin Current vs Input Voltage****Figure 12 : Quiescent Current vs Output Current**

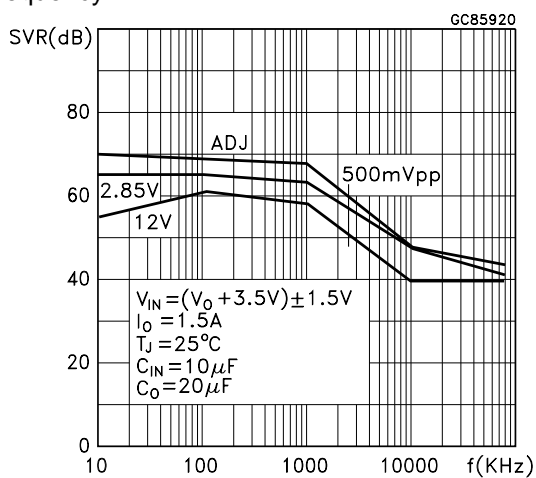
**Figure 13 : Quiescent Current vs Input Voltage**



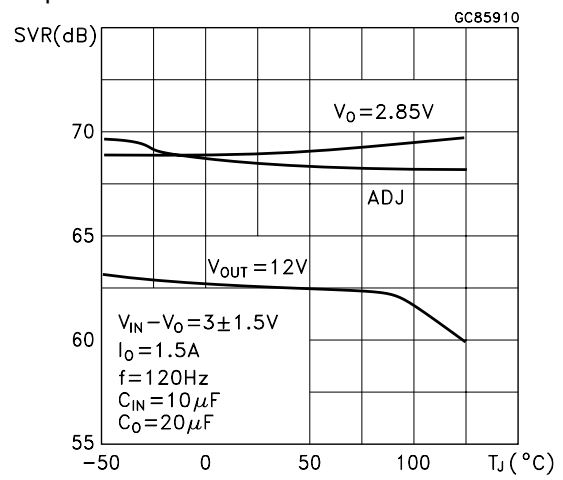
**Figure 14 : Supply Voltage Rejection vs Output Current**



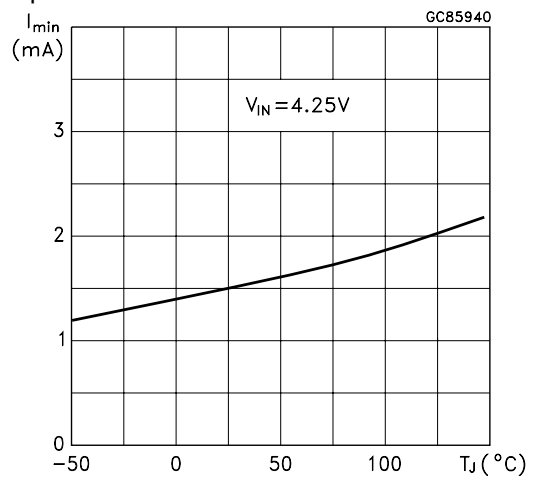
**Figure 15 : Supply Voltage Rejection vs Frequency**



**Figure 16 : Supply Voltage Rejection vs Temperature**



**Figure 17 : Minimum Load Current vs Temperature**



**Figure 18 : Stability for Adjustable**

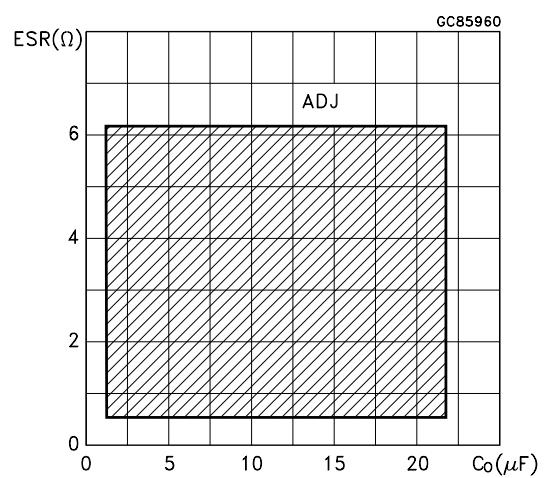


Figure 19 : Stability for 2.85V

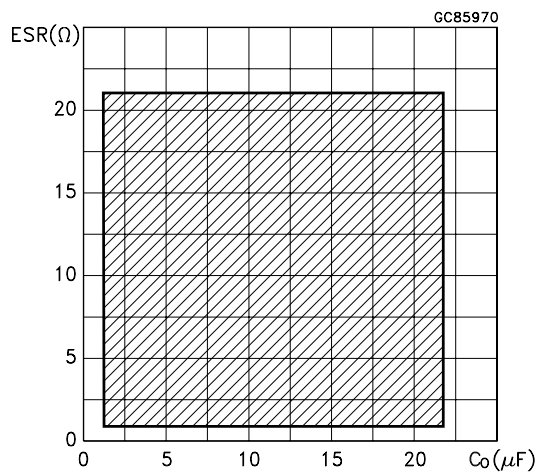


Figure 20 : Stability for 12V

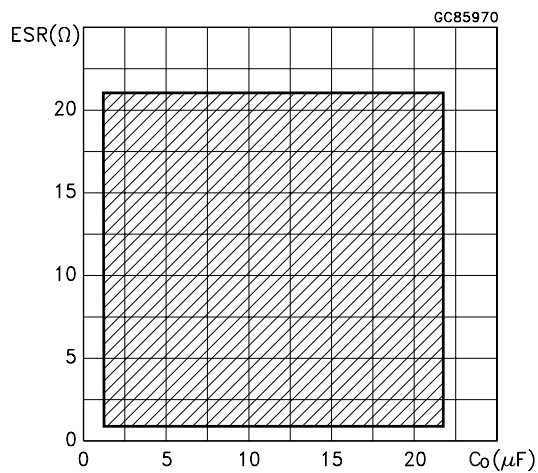


Figure 21 : Line Transient

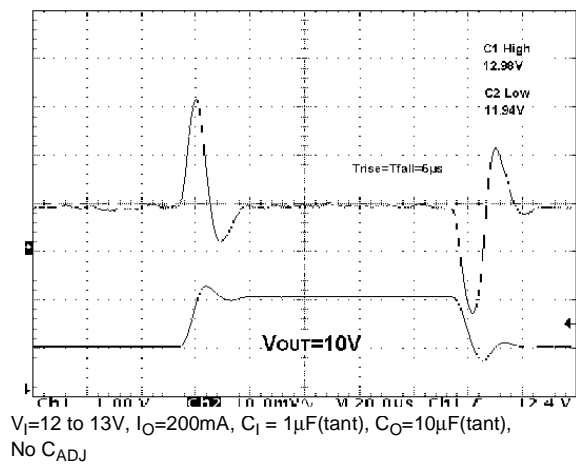


Figure 22 : Line Transient

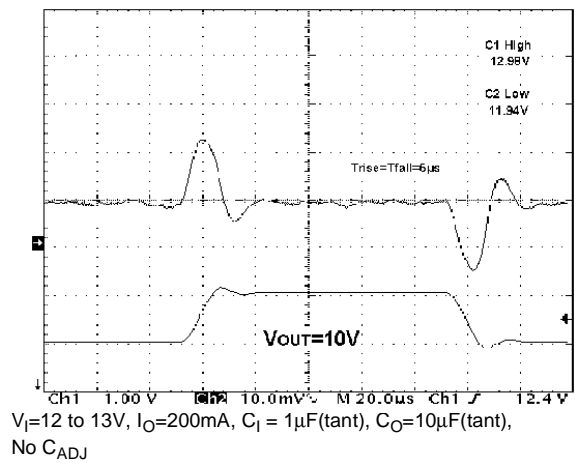


Figure 23 : Line Transient

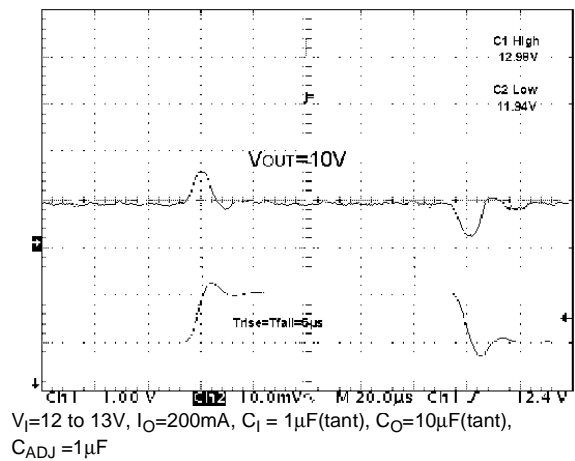


Figure 24 : Load Transient

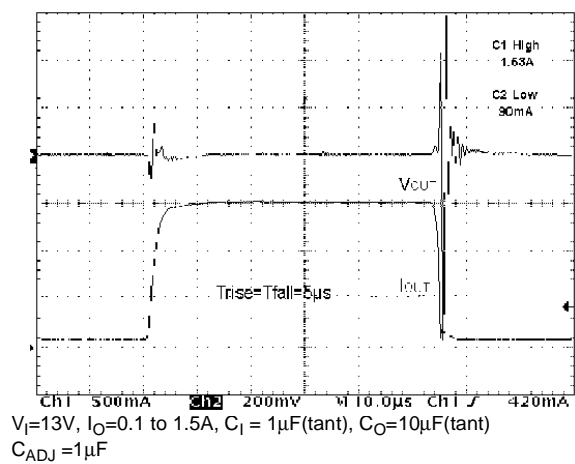


Figure 25 : Load Transient

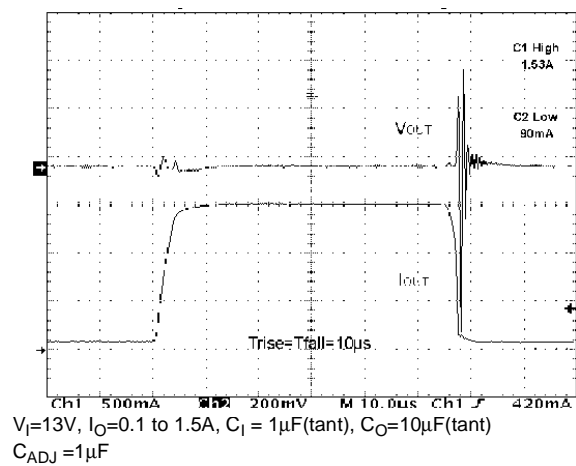
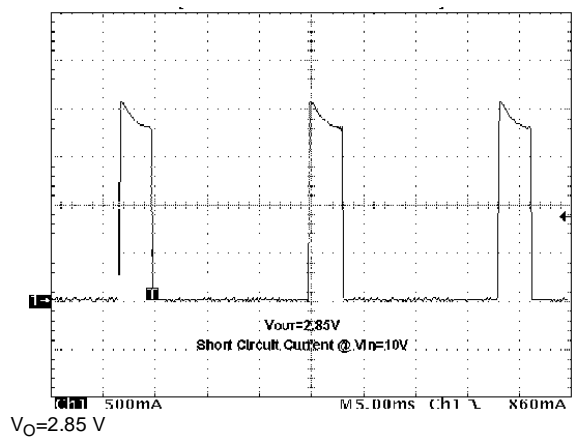
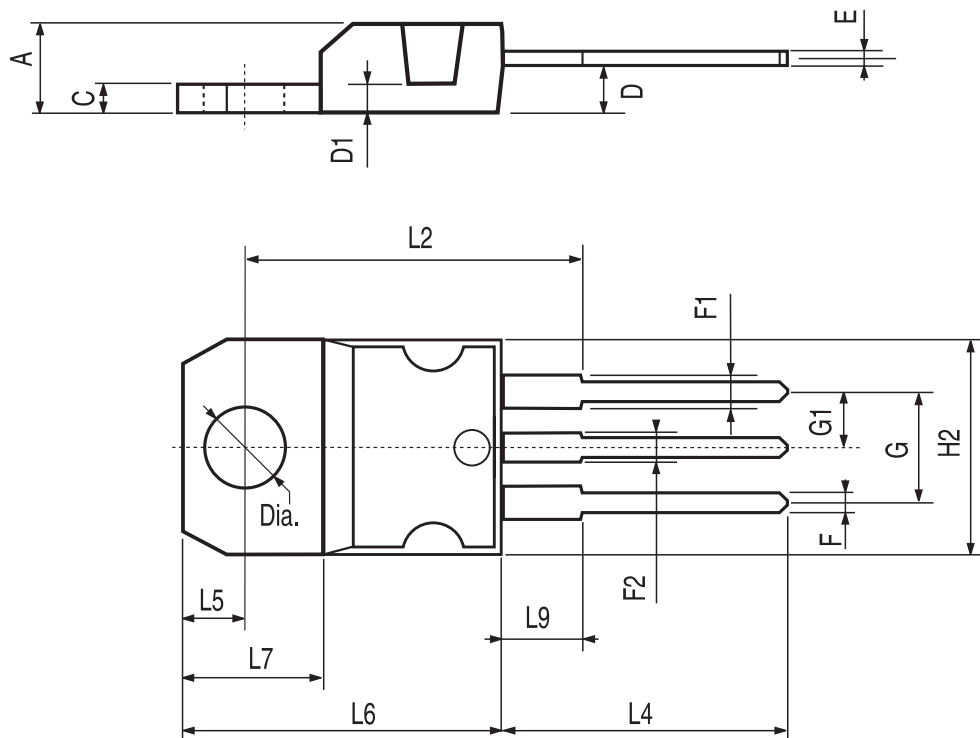


Figure 26 : Thermal Protection



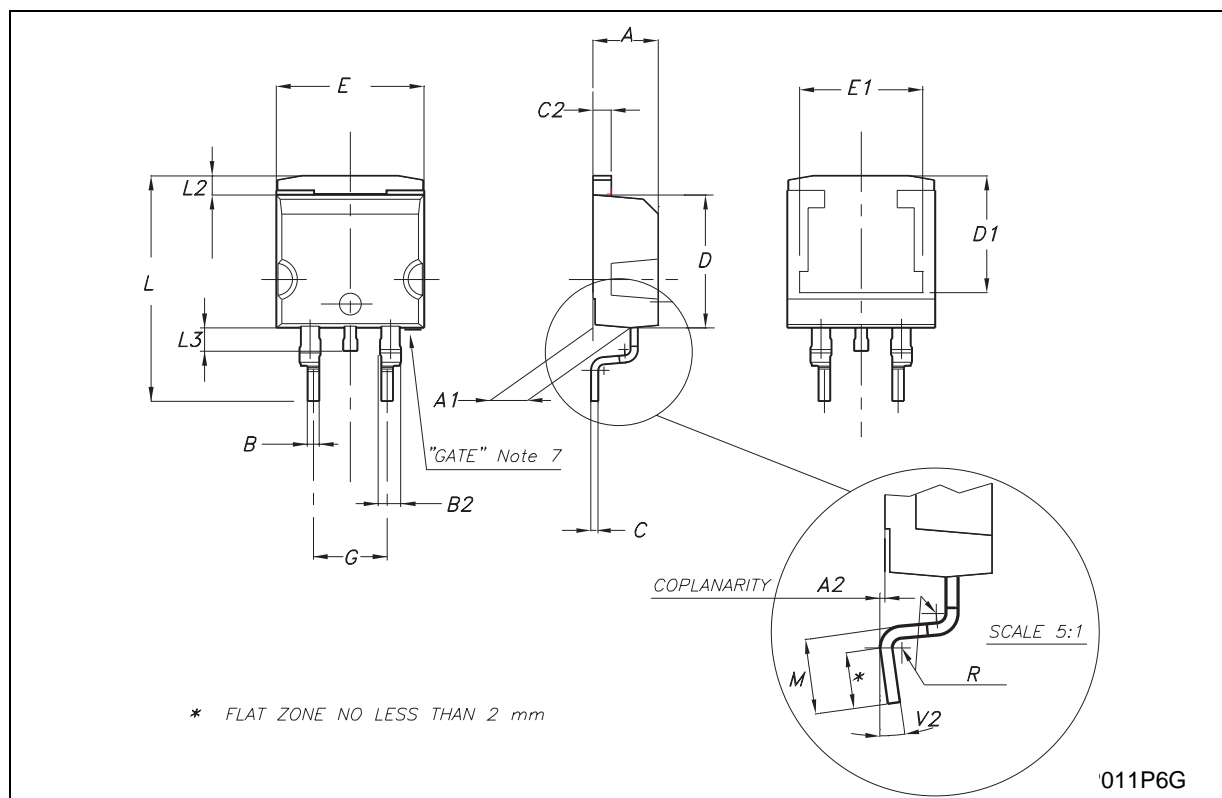
## TO-220 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



D<sup>2</sup>PAK MECHANICAL DATA

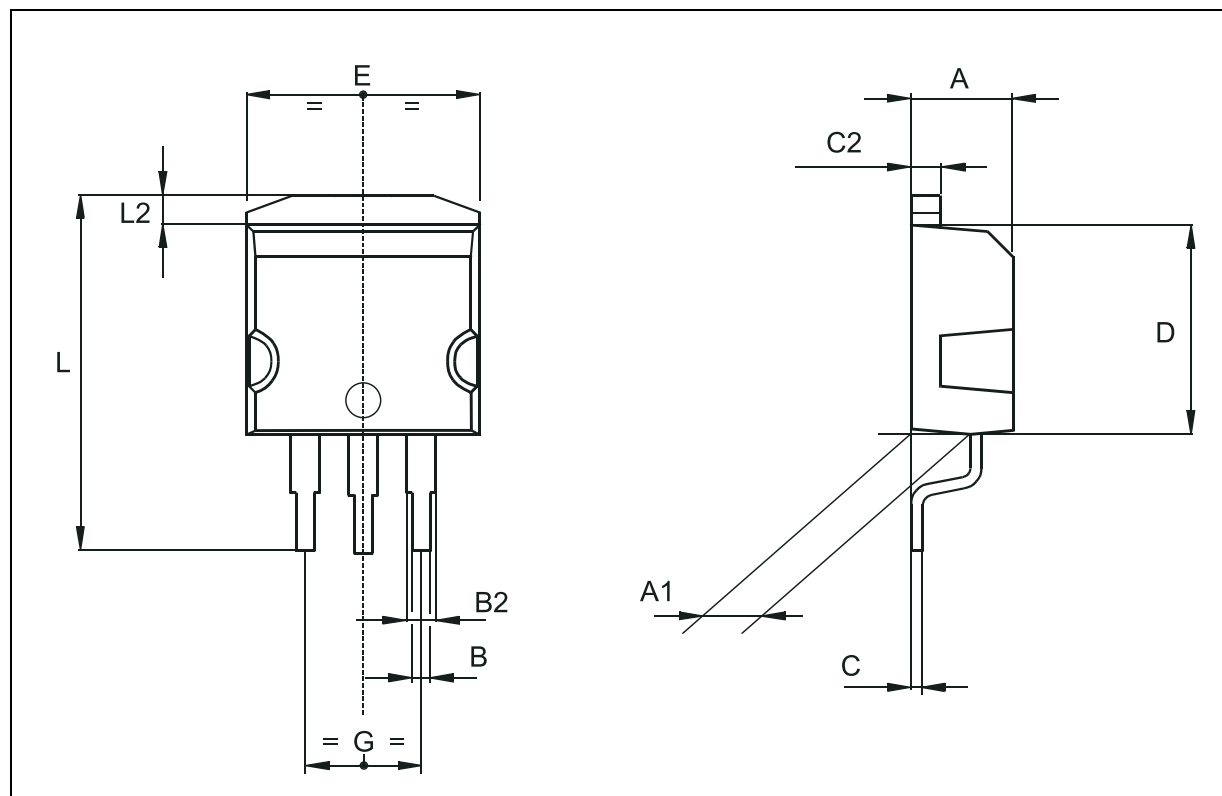
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		0.409
E1		8.5			0.335	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068
M	2.4		3.2	0.094		0.126
R		0.4			0.016	
V2	0°		8°	0°		8°





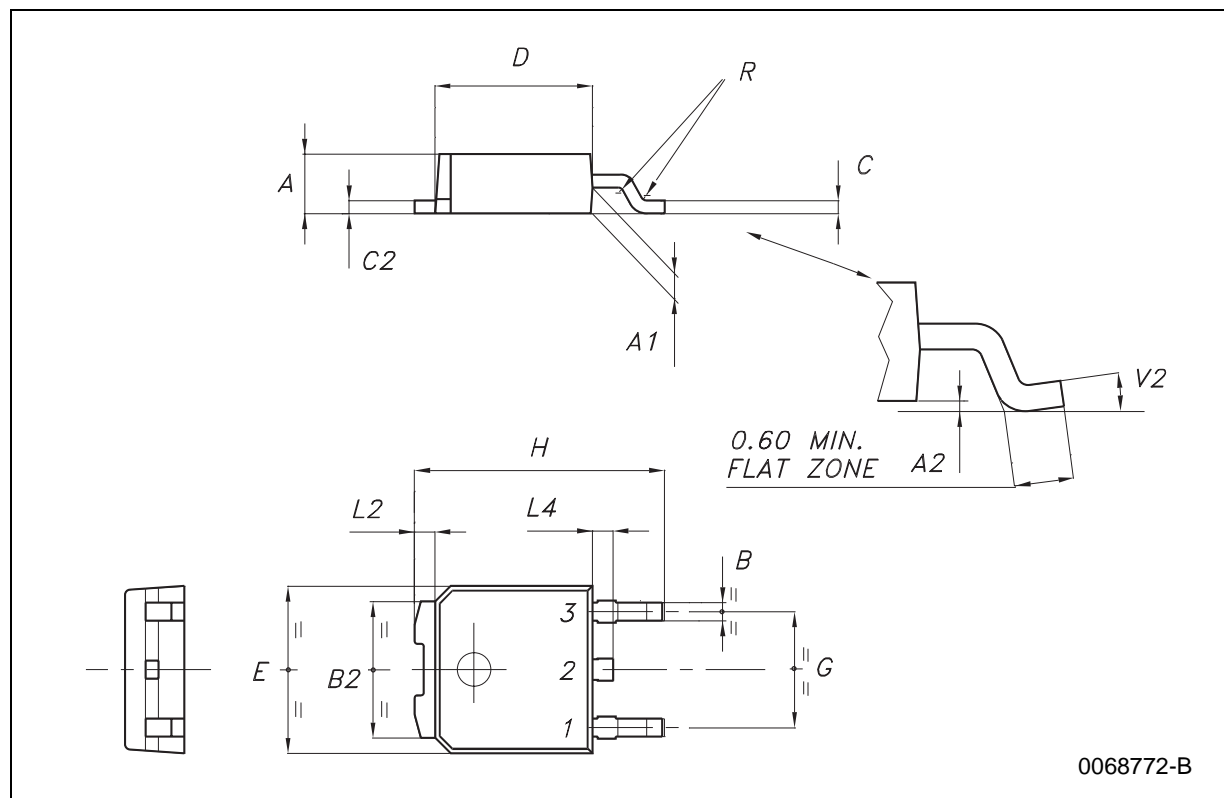
**D<sup>2</sup>PAK/A MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
A1	2.49		2.69	0.098		0.106
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.60	0.017		0.023
C2	1.21		1.36	0.047		0.053
D	8.95		9.35	0.352		0.368
E	10		10.4	0.393		0.409
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.106
L2	1.27		1.4	0.050		0.055



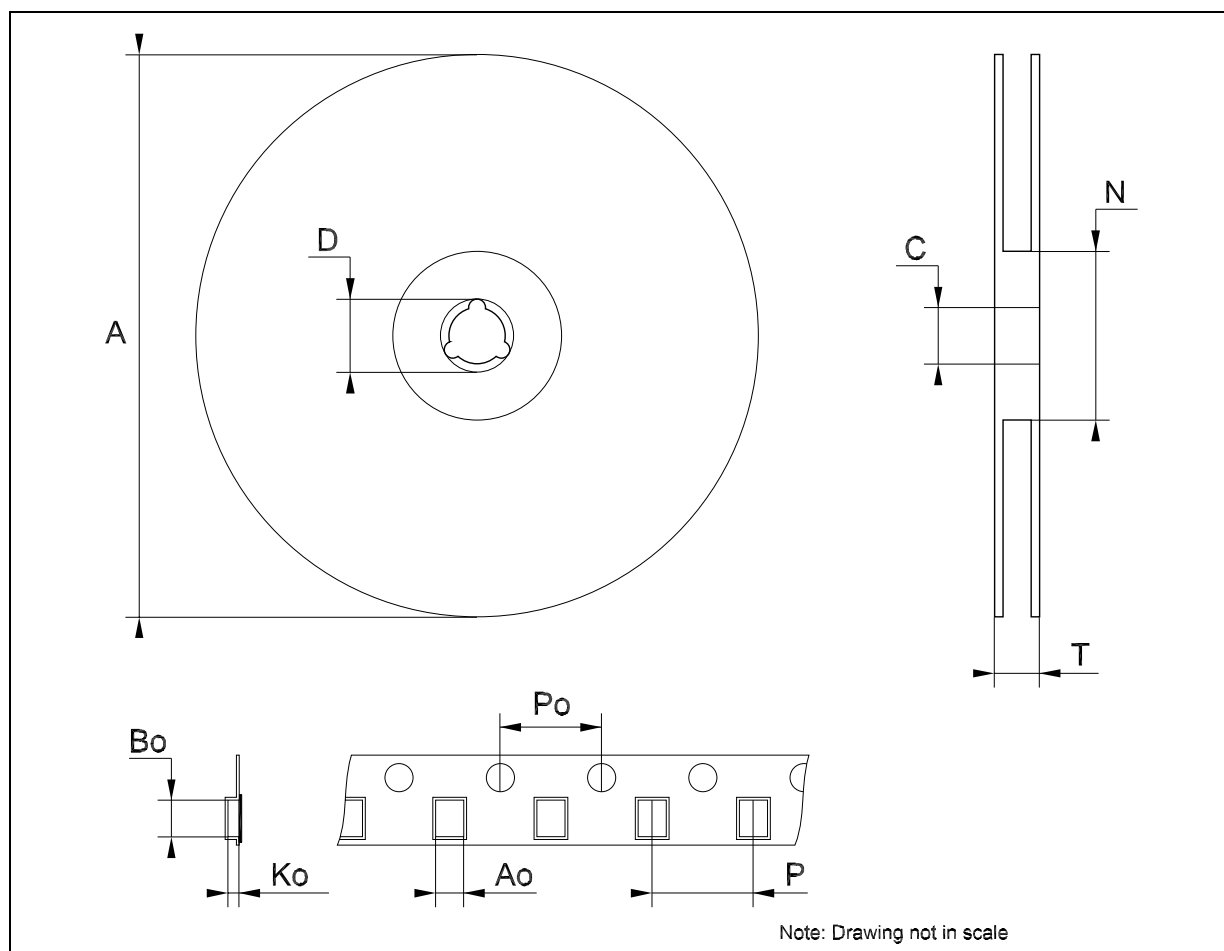
## DPAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	2.2		2.4	0.086		0.094
A1	0.9		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.9	0.025		0.035
B2	5.2		5.4	0.204		0.212
C	0.45		0.6	0.017		0.023
C2	0.48		0.6	0.019		0.023
D	6		6.2	0.236		0.244
E	6.4		6.6	0.252		0.260
G	4.4		4.6	0.173		0.181
H	9.35		10.1	0.368		0.397
L2		0.8			0.031	
L4	0.6		1	0.023		0.039



### Tape & Reel DPAK-PPAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			14.4			0.567
Ao	6.80	6.90	7.00	0.268	0.272	0.276
Bo	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	7.9	8.0	8.1	0.311	0.315	0.319



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