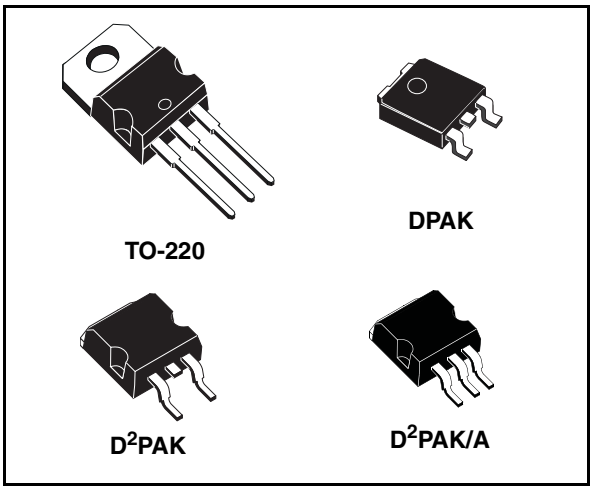
LD1086 series

1.5A Low drop positive voltage regulator adjustable and fixed

Feature summary

- Typical dropout 1.3V at 1.5A
- Three terminal adjustable or fixed output voltage 1.5V, 1.8V, 2.5V, 3.3V, 3.6V, 5V, 8V, 9V, 12V.
- Guaranteed output current up to 1.5A
- Output tolerance ±1% at 25°C and ±2% in full temperature range
- Internal power and thermal limit
- Wide operating temperature range -40°C to 125°C
- Package available: TO-220, D^2PAK, D^2PAK/A, DPAK
- Pinout compatibility with standard adjustable VREG

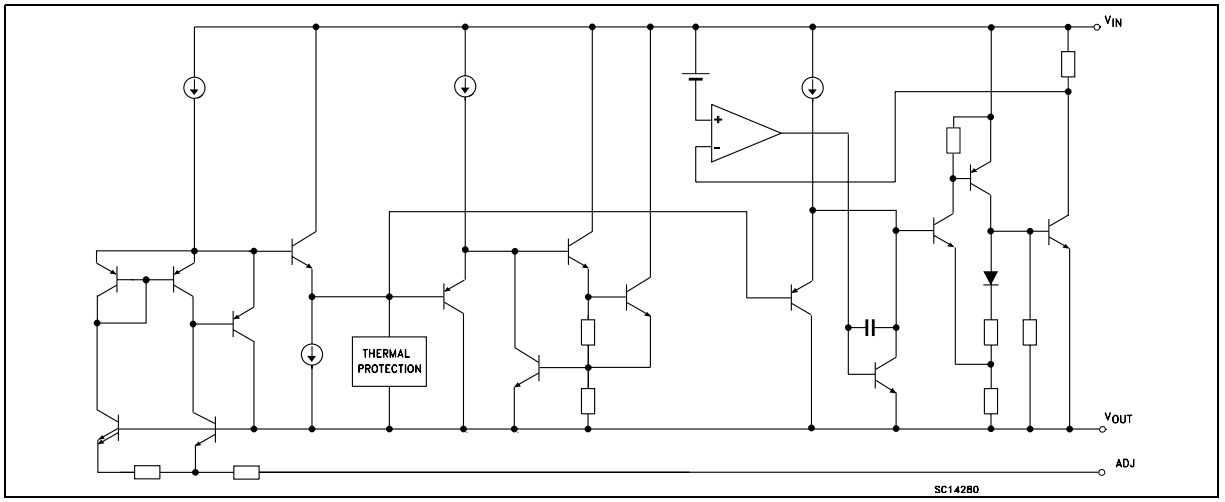


Description

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 10µF minimum capacitor is need for stability. The device is supplied in TO-220, D^2PAK, D^2PAK/A and DPAK. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within ±1% at 25°C.

Schematic diagram



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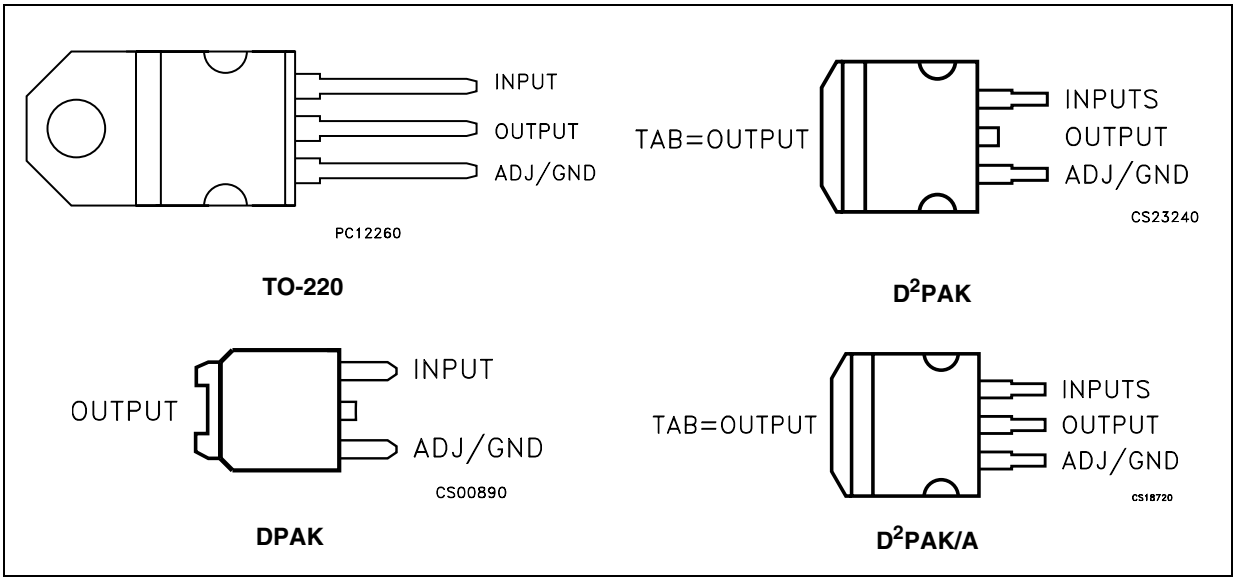
1 Pin configuration

Figure 1. Pin connections (top view)



2 Maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	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

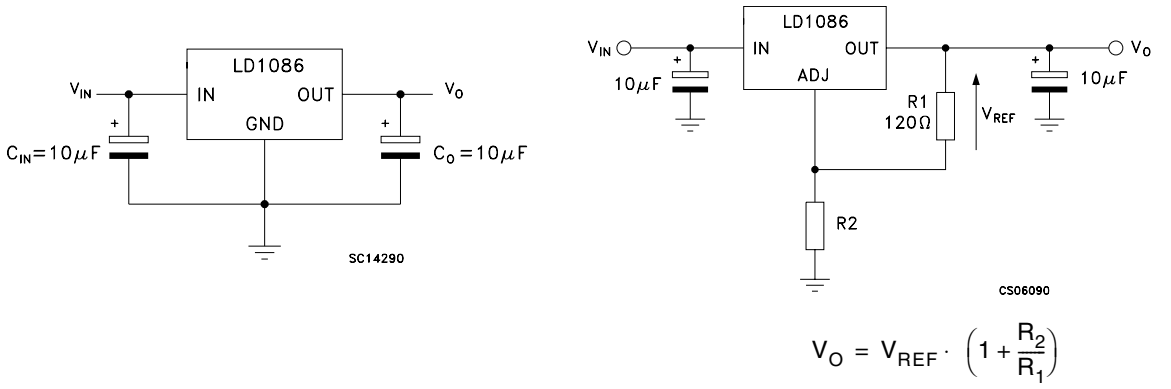
Note: Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied

Table 2. Thermal Data

Symbol	Parameter	TO-220	D^2PAK	DPAK	Unit
R_{thJC}	Thermal resistance junction-case	3	3	8	°C/W
R_{thJA}	Thermal resistance junction-ambient	50	62.5		°C/W

3 Schematic application

Figure 2. Application circuit



4 Electrical characteristics

Table 3. Electrical characteristics of LD1086#15
(V_I=4.5V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 3.1 to 18V, T_J = 25°C		0.2	4	mV
		I_O = 0 mA, V_I = 3.1 to 15V		0.4	4	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		0.5	8	mV
		I_O = 0 to 1.5A		1	16	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 6.5 ± 3V	60	82		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 4. Electrical characteristics of LD1086#18
(V_I=4.8V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 3.4 to 18V, T_J = 25°C		0.2	4	mV
		I_O = 0 mA, V_I = 3.4 to 15V		0.4	4	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		0.5	8	mV
		I_O = 0 to 1.5A		1	16	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 6.8 ± 3V	60	82		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 5. Electrical characteristics of LD1086#25
(V_I=5.5V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 4.1 to 18V, T_J = 25°C		0.2	4	mV
		I_O = 0 mA, V_I = 4.1 to 18V		0.4	4	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		0.5	8	mV
		I_O = 0 to 1.5A		1	16	mV
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°C, 30ms pulse		0.008	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 7.5 ± 3V	60	81		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 6. Electrical characteristics of LD1086#33
(V_I=6.3V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°C	3.267	3.3	3.333	V
		I_O = 0 to 1.5A, V_I = 4.9 to 30V	3.234	3.3	3.366	V
ΔV_O	Line regulation	I_O = 0 mA, V_I = 4.9 to 18V, T_J = 25°C		0.5	6	mV
		I_O = 0 mA, V_I = 4.9 to 18V		1	6	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		1	10	mV
		I_O = 0 to 1.5A		7	25	mV
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°C, 30ms pulse		0.008	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 8.3 ± 3V	60	79		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 7. Electrical characteristics of LD1086#36
(V_I=6.6V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 5.2 to 18V, T_J = 25°C		0.5	10	mV
		I_O = 0 mA, V_I = 5.2 to 18V		1	10	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		3	15	mV
		I_O = 0 to 1.5A		7	25	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 8.6 ± 3V	60	78		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 8. Electrical characteristics of LD1086#50
(V_I=8V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 6.6 to 20V, T_J = 25°C		0.5	10	mV
		I_O = 0 mA, V_I = 6.6 to 20V		1	10	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		5	20	mV
		I_O = 0 to 1.5A		10	35	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 10 ± 3V	60	75		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 9. Electrical characteristics of LD1086#80
(V_I=11V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 9.8 to 20V, T_J = 25°C		1	18	mV
		I_O = 0 mA, V_I = 9.8 to 20V		2	18	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		8	30	mV
		I_O = 0 to 1.5A		12	60	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 13 ± 3V	54	71		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 10. Electrical characteristics of LD1086#90
(V_I=12V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°C	8.91	9	9.09	V
		I_O = 0 to 1.5A, V_I = 11 to 30V	8.82	9	9.18	V
ΔV_O	Line regulation	I_O = 0 mA, V_I = 11 to 20V, T_J = 25°C		1	20	mV
		I_O = 0 mA, V_I = 11 to 20V		2	20	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		8	30	mV
		I_O = 0 to 1.5A		12	60	mV
V_d	Dropout voltage	I_O = 1.5A		1.3	1.5	V
I_q	Quiescent current	V_I ≤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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 14 ± 3V	54	70		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 11. Electrical characteristics of LD1086#12
(V_I=15V, $C_I = C_O$ =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 0 mA, T_J = 25°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
ΔV_O	Line regulation	I_O = 0 mA, V_I = 13.8 to 25V, T_J = 25°C		1	25	mV
		I_O = 0 mA, V_I = 13.8 to 25V		2	25	mV
ΔV_O	Load regulation	I_O = 0 to 1.5A, T_J = 25°C		12	36	mV
		I_O = 0 to 1.5A		24	72	mV
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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	f = 120 Hz, C_O = 25 µF, I_O = 1.5A V_I = 17 ± 3V	54	66		dB
eN	RMS Output noise voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T_A = 125°C, 1000Hrs		0.5		%

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

Table 12. Electrical characteristics of LD1086#
(V_I=4.25V, C_I = C_O =10µF, T_A = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V_O	Output voltage (1)	I_O = 10mA T_J = 25°C	1.237	1.25	1.263	V
		I_O = 10mA to 1.5A, V_I = 2.85 to 30V	1.225	1.25	1.275	V
ΔV_O	Line Regulation	I_O = 10mA, V_I = 2.8 to 16.5V, T_J = 25°C		0.015	0.2	%
		I_O = 10mA, V_I = 2.8 to 16.5V		0.035	0.2	%
ΔV_O	Load Regulation	I_O = 10mA to 1.5A, T_J = 25°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°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	f = 120 Hz, C_O = 25 µF,C_{ADJ} = 25 µF, I_O = 1.5A, V_I = 6.25 ±3V	60	88		dB
I_{ADJ}	Adjust Pin Current	V_I = 4.25V, I_O = 10 mA		40	120	µA
ΔI_{ADJ}	Adjust Pin Current Change (1)	I_O = 10mA to 1.5A, V_I = 2.8 to 16.5V		0.2	5	µA
eN	RMS Output Noise Voltage (% of V_O)	T_A = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	T_A = 125°C, 1000Hrs		0.5		%

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

5 Typical application

(Unless otherwise specified T_J = 25°C, C_I = C_O = 10µF)

Figure 3. Output voltage vs temperature

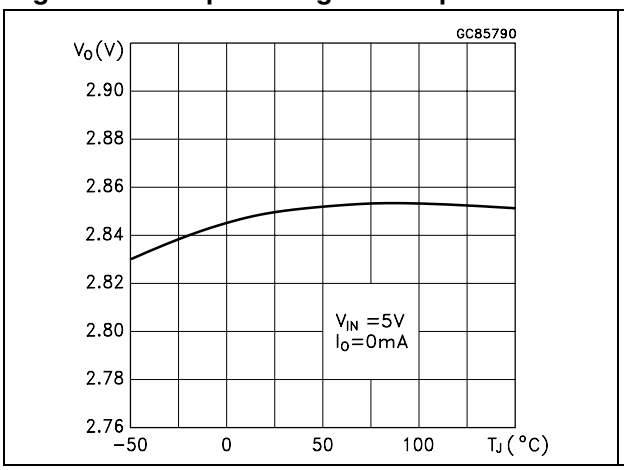


Figure 4. Output voltage vs temperature

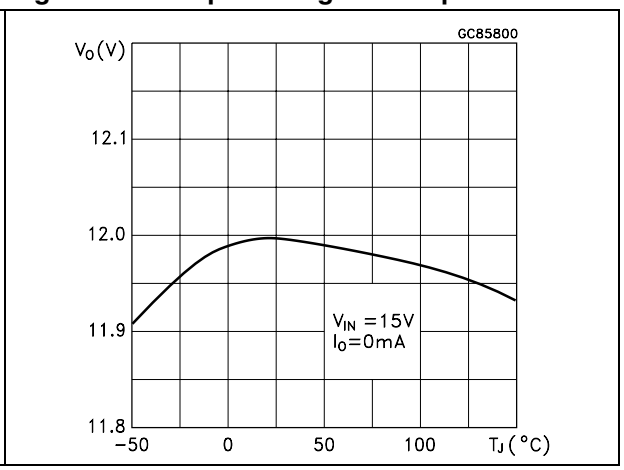


Figure 5. Output voltage vs temperature

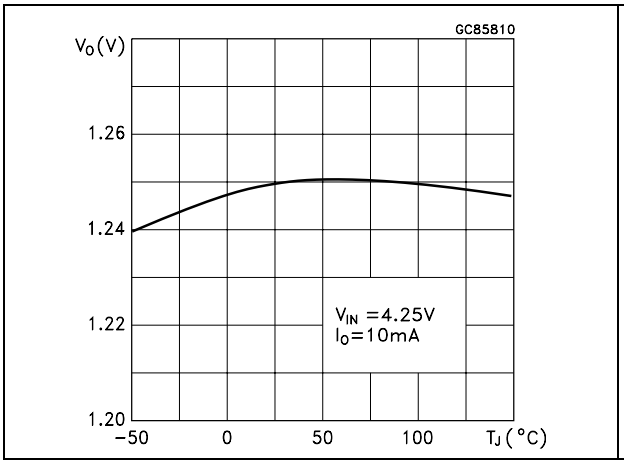


Figure 6. Short circuit current vs dropout voltage

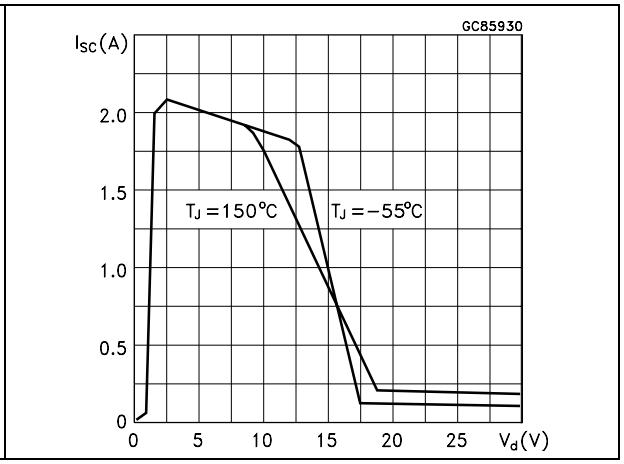


Figure 7. Line regulation vs temperature

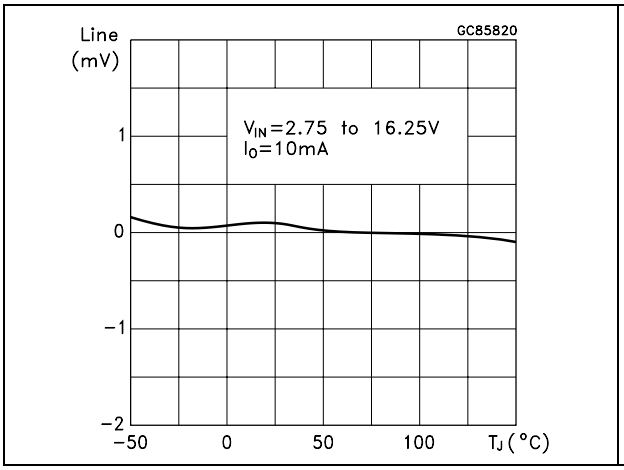


Figure 8. Load regulation vs temperature

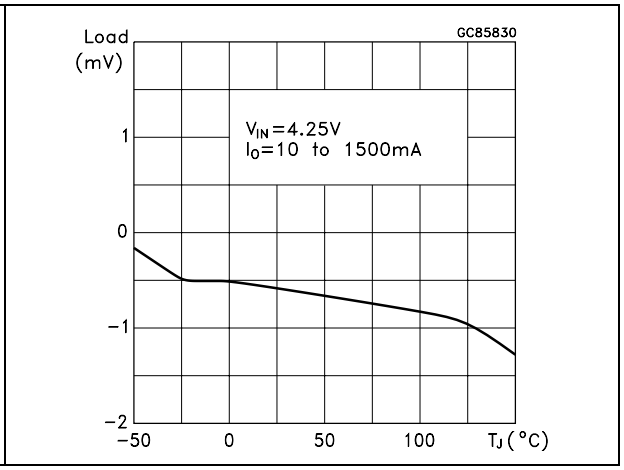


Figure 9. Dropout voltage vs temperature

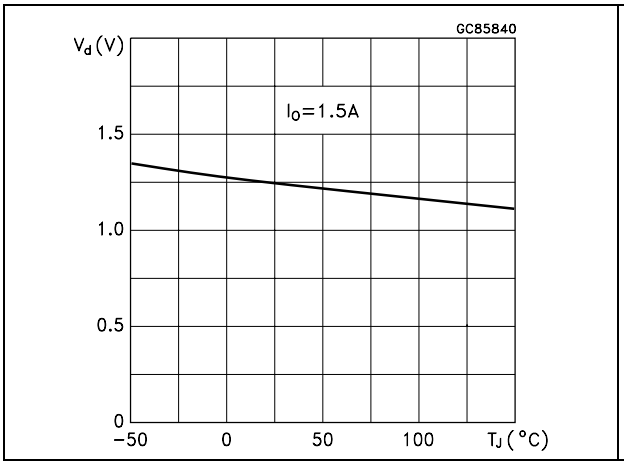


Figure 10. Dropout voltage vs output current

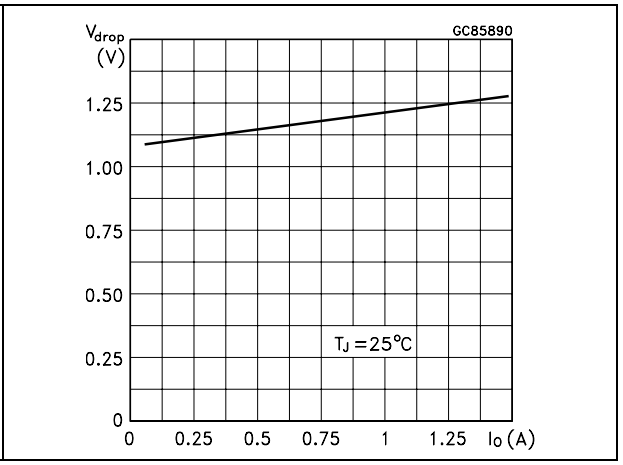


Figure 11. Adjust pin current vs input voltage

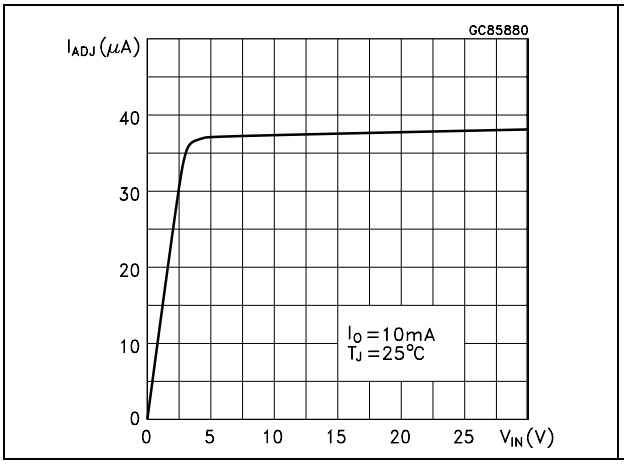


Figure 12. Adjust pin current vs temperature

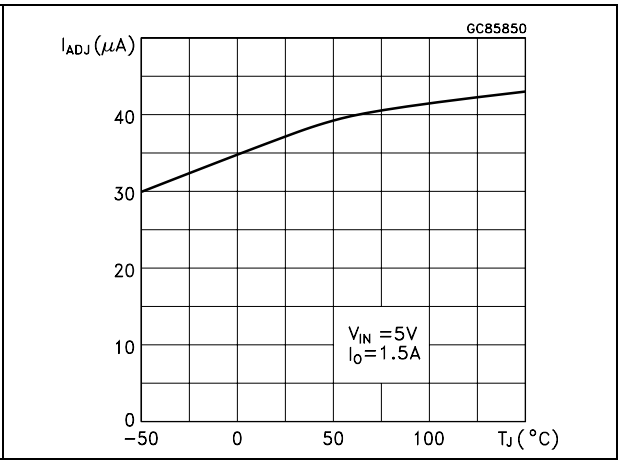


Figure 13. Adjust pin current vs output current

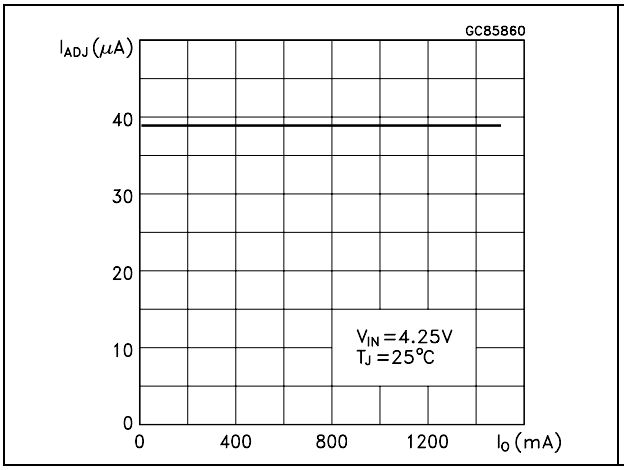


Figure 14. Quiescent current vs output current

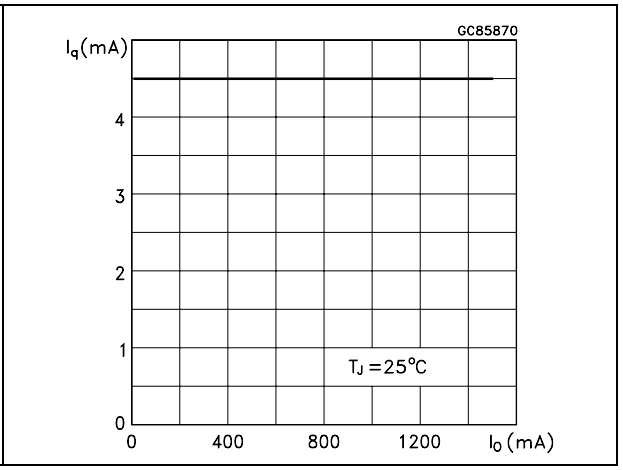


Figure 15. Quiescent current vs input voltage

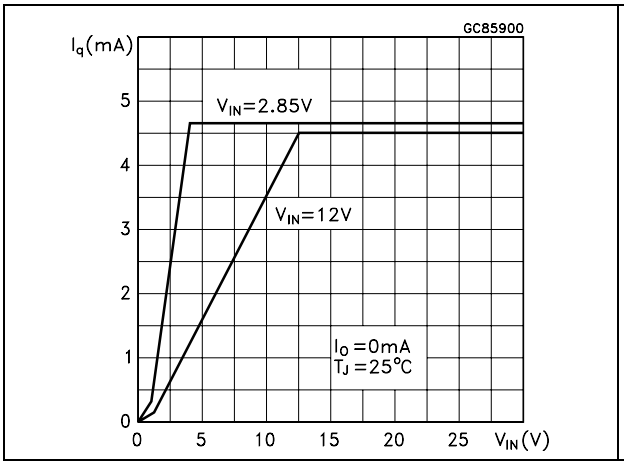


Figure 16. Supply voltage rejection vs output current

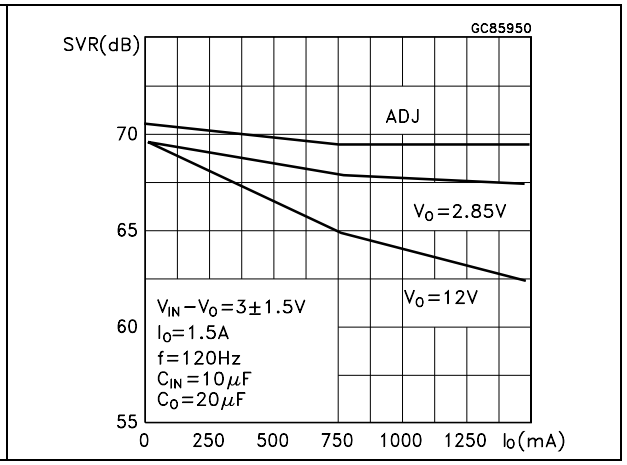


Figure 17. Supply voltage rejection vs frequency

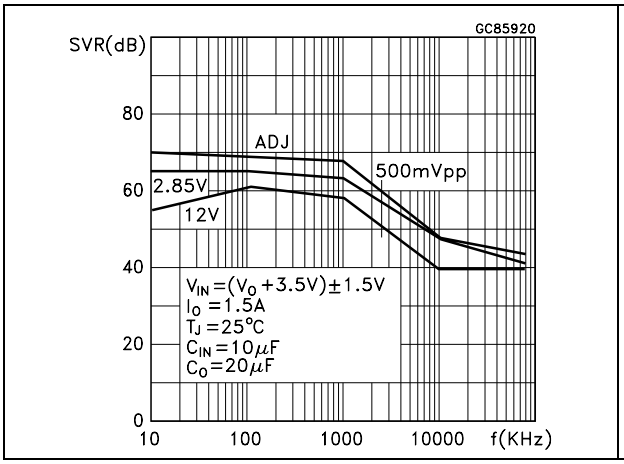


Figure 18. Supply voltage rejection vs temperature

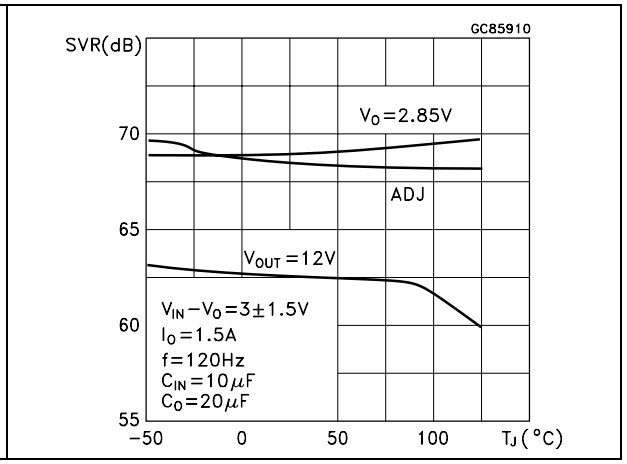


Figure 19. Minimum load current vs temperature

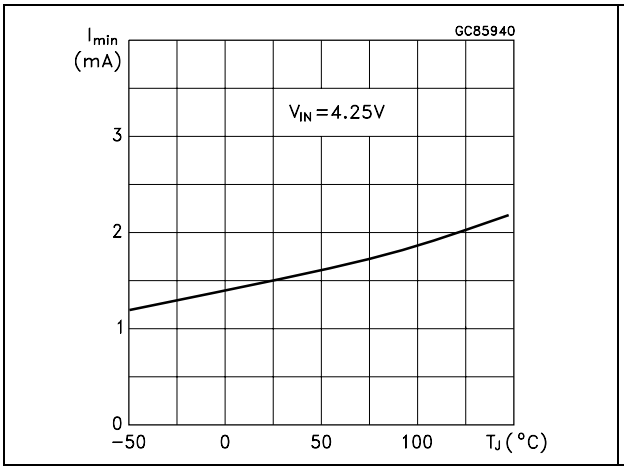


Figure 20. Stability for adjustable

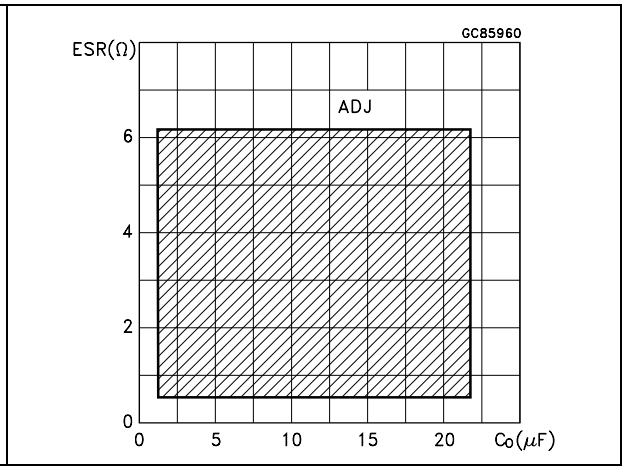


Figure 21. Stability for 2.85V

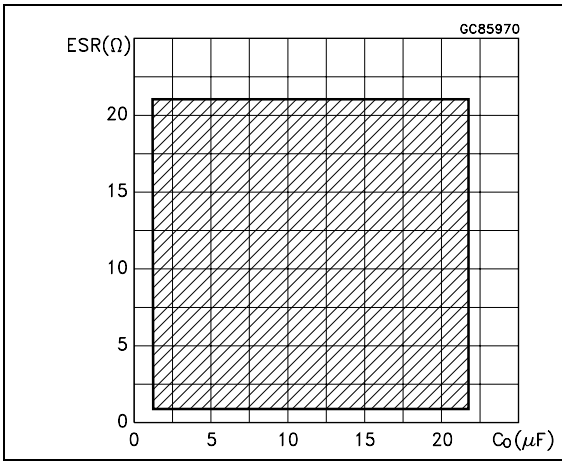


Figure 22. Stability for 12V

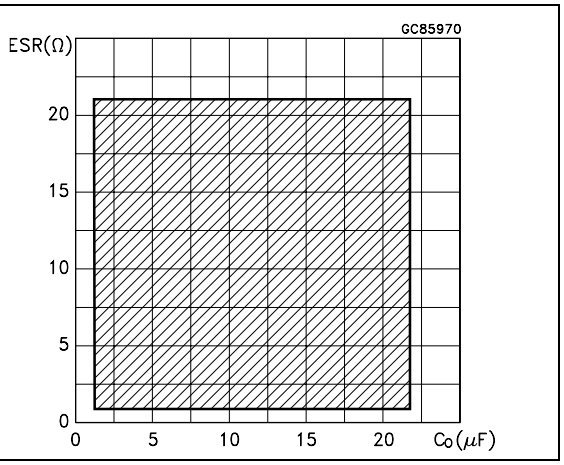
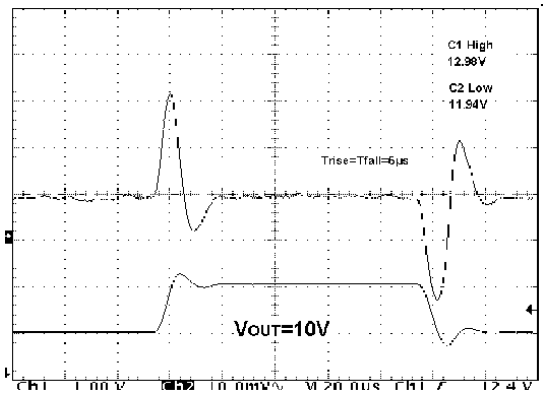
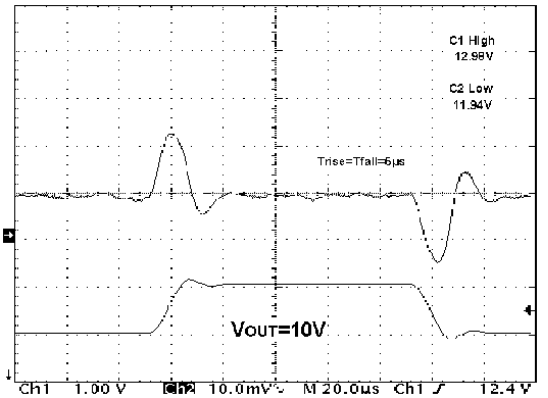


Figure 23. Line transient



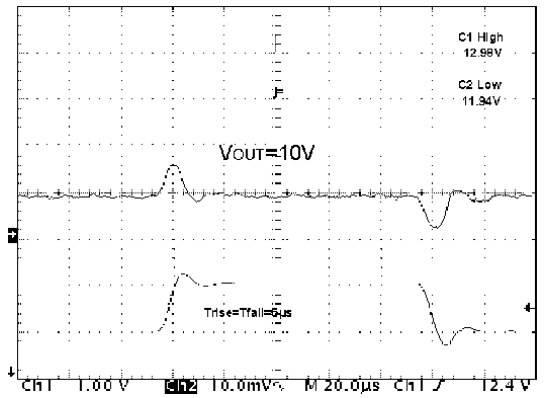
V_I=12 to 13V, I_O=200mA, C_I = 1µF(tant), C_O=10µF(tant), No C_{ADJ}

Figure 24. Line transient



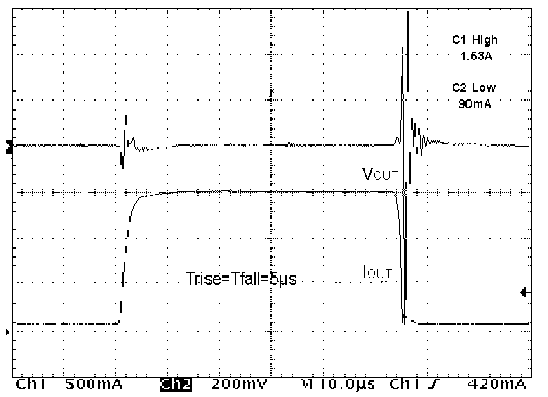
V_I=12 to 13V, I_O=200mA, C_I = 1µF(tant), C_O=10µF(tant), No C_{ADJ}

Figure 25. Line transient



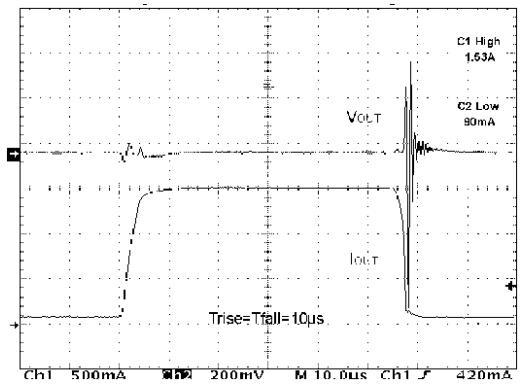
V_I=12 to 13V, I_O=200mA, C_I = 1µF(tant), C_O=10µF(tant), C_{ADJ} = 1µF

Figure 26. Load transient



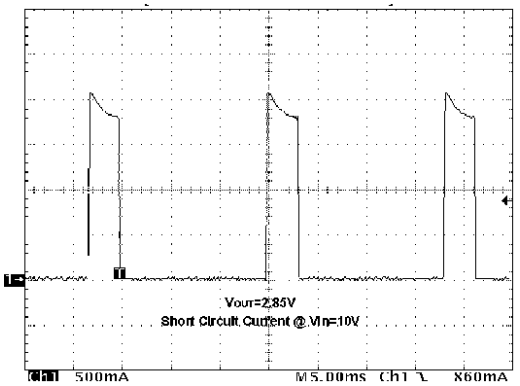
V_I=13V, I_O=0.1 to 1.5A, C_I = 1µF(tant), C_O=10µF(tant) C_{ADJ} =1µF

Figure 27. Load transient



V_I=13V, I_O=0.1 to 1.5A, C_I=1µF(tant), C_O=10µF(tant), C_{ADJ} =1µF

Figure 28. Thermal protection



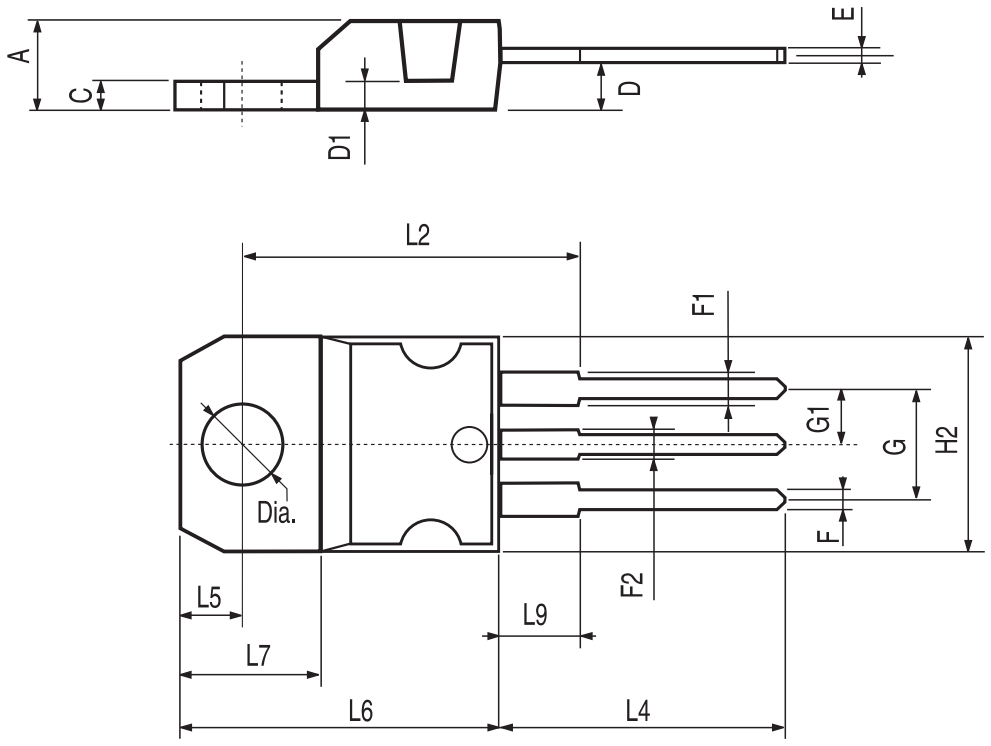
V_O=2.85V

6 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

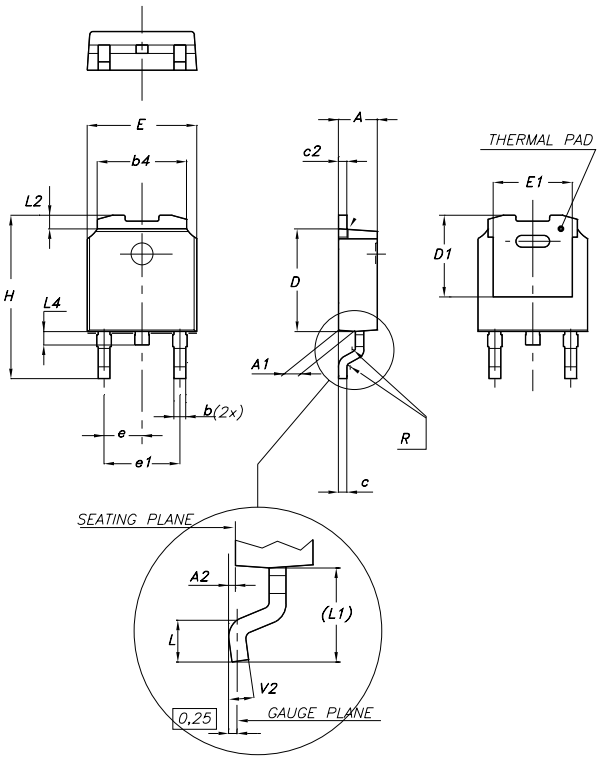
TO-220 MECHANICAL DATA

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



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
b4	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
D1		5.1			0.200	
E	6.4		6.6	0.252		0.260
E1		4.7			0.185	
e		2.28			0.090	
e1	4.4		4.6	0.173		0.181
H	9.35		10.1	0.368		0.397
L	1			0.039		
(L1)		2.8			0.110	
L2		0.8			0.031	
L4	0.6		1	0.023		0.039
R		0.2			0.008	
V2	0°		8°	0°		8°



0068772-F

Figure 29. DRAWING DIMENSION D²PAK (TYPE STD-ST)

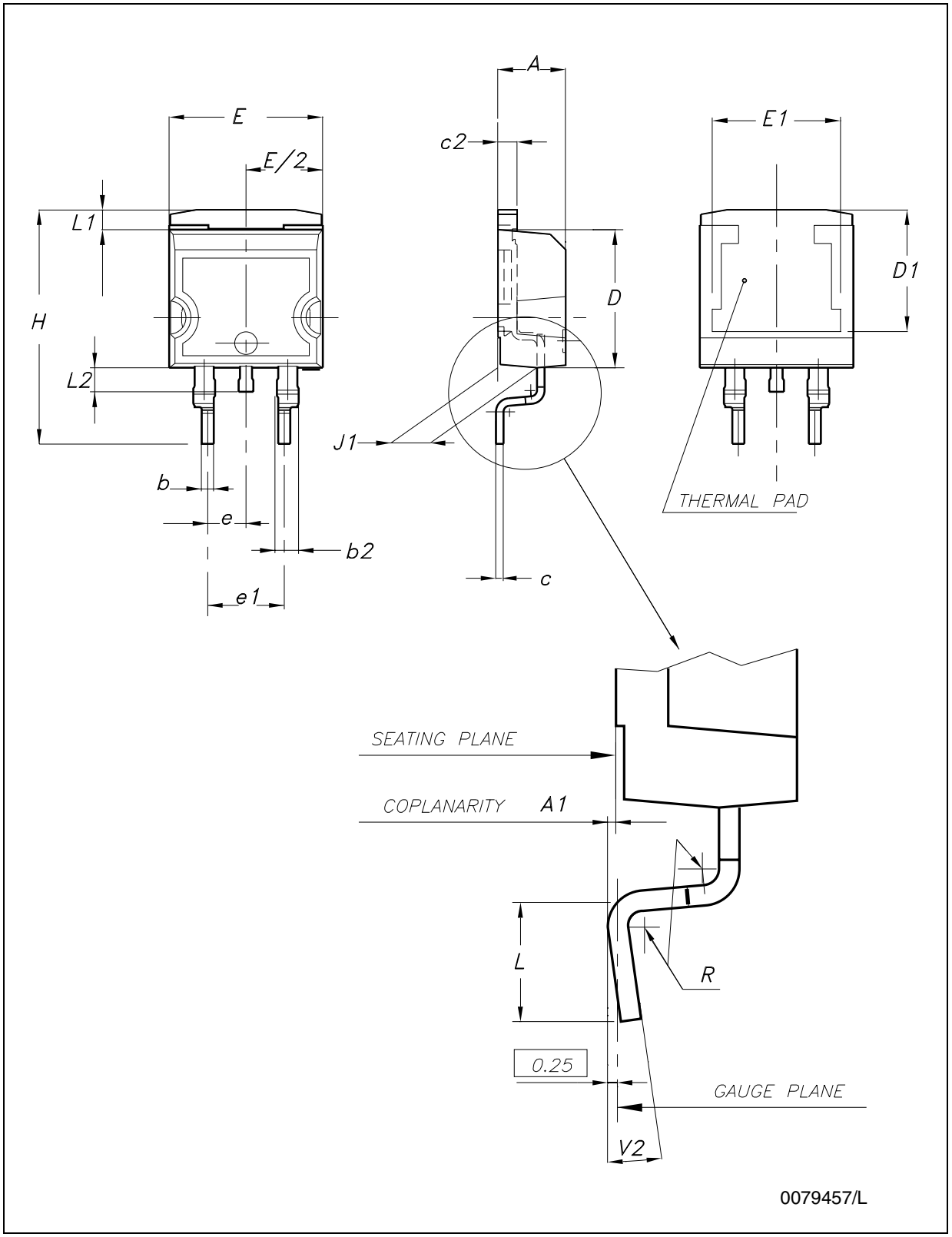


Figure 30. DRAWING DIMENSION D²PAK (TYPE WOOSEOK-SUBCON.)

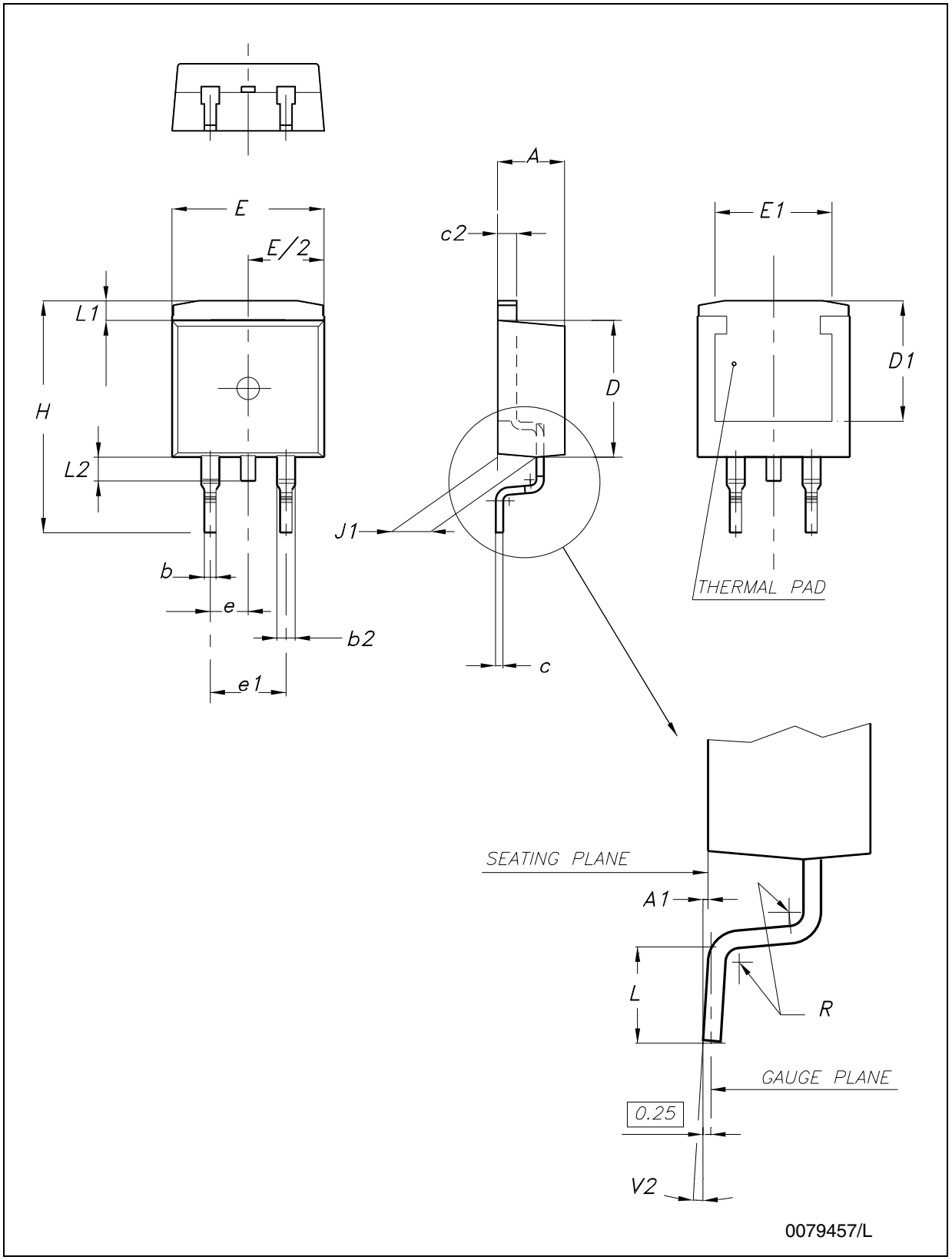


Table 13. D^2PAK MECHANICAL DATA

DIM.	TYPE STD-ST			TYPE WOOSEOK-SUBCON.		
	mm.			mm.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	4.30		4.70
A1	0.03		0.23	0		0.20
b	0.70		0.93	0.70		0.90
b2	1.14		1.70	1.17		1.37
c	0.45		0.60	0.45	0.50	0.60
c2	1.23		1.36	1.25	1.30	1.40
D	8.95		9.35	9	9.20	9.40
D1	7.50			7.50		
E	10		10.40	9.80		10.20
E1	8.50			7.50		
e		2.54			2.54	
e1	4.88		5.28		5.08	
H	15		15.85	15	15.30	15.60
J1	2.49		2.69	2.20		2.60
L	2.29		2.79	1.79		2.79
L1	1.27		1.40	1		1.40
L2	1.30		1.75	1.20		1.60
R		0.4			0.30	
V2	0°		8°	0°		3°

Note: The D^2PAK package coming from the subcontractor Wooseok is fully compatible with the ST's package suggested footprint.

Figure 31. D²PAK FOOTPRINT RECOMMENDED DATA

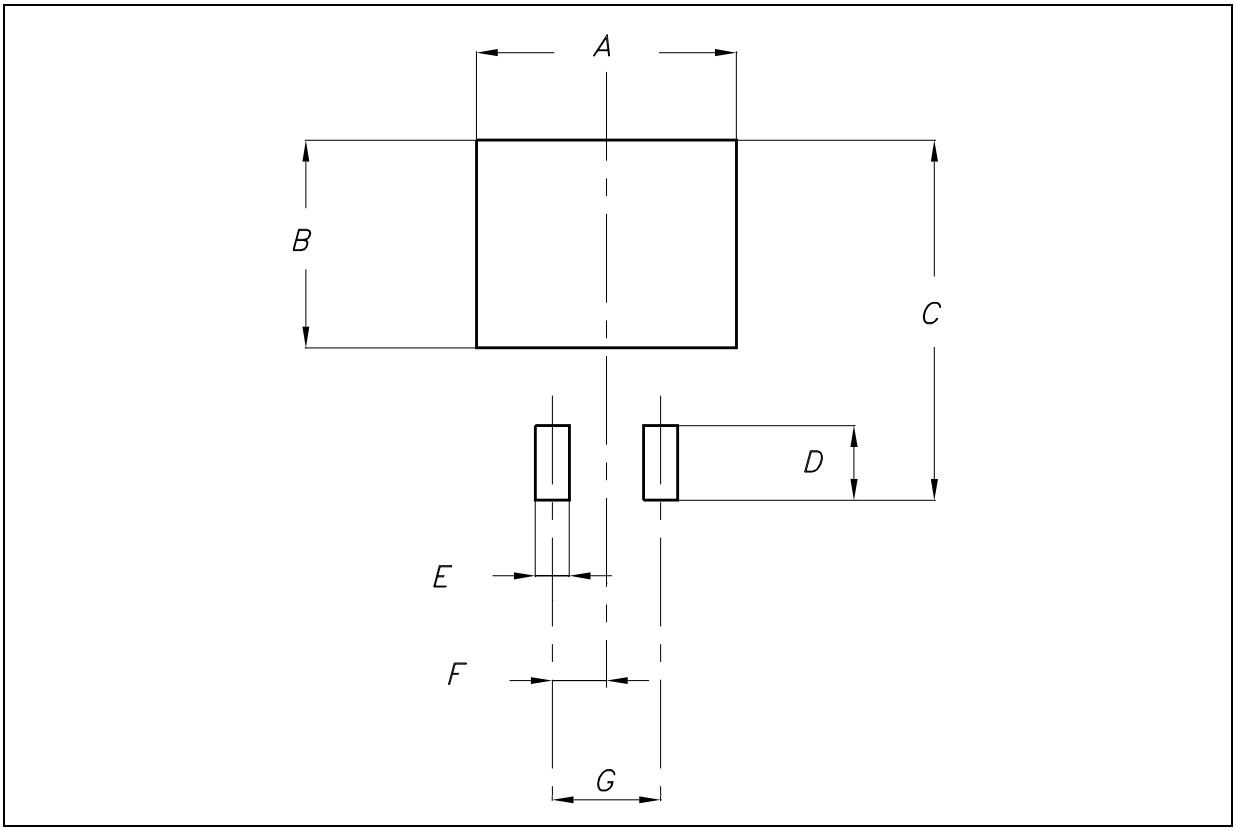


Table 14. FOOTPRINT DATA

VALUES		
	mm.	**inch.**
A	12.20	0.480
B	9.75	0.384
C	16.90	0.665
D	3.50	0.138
E	1.60	0.063
F	2.54	0.100
G	5.08	0.200

Figure 32. DRAWING DIMENSION D²PAK/A (TYPE STD-ST)

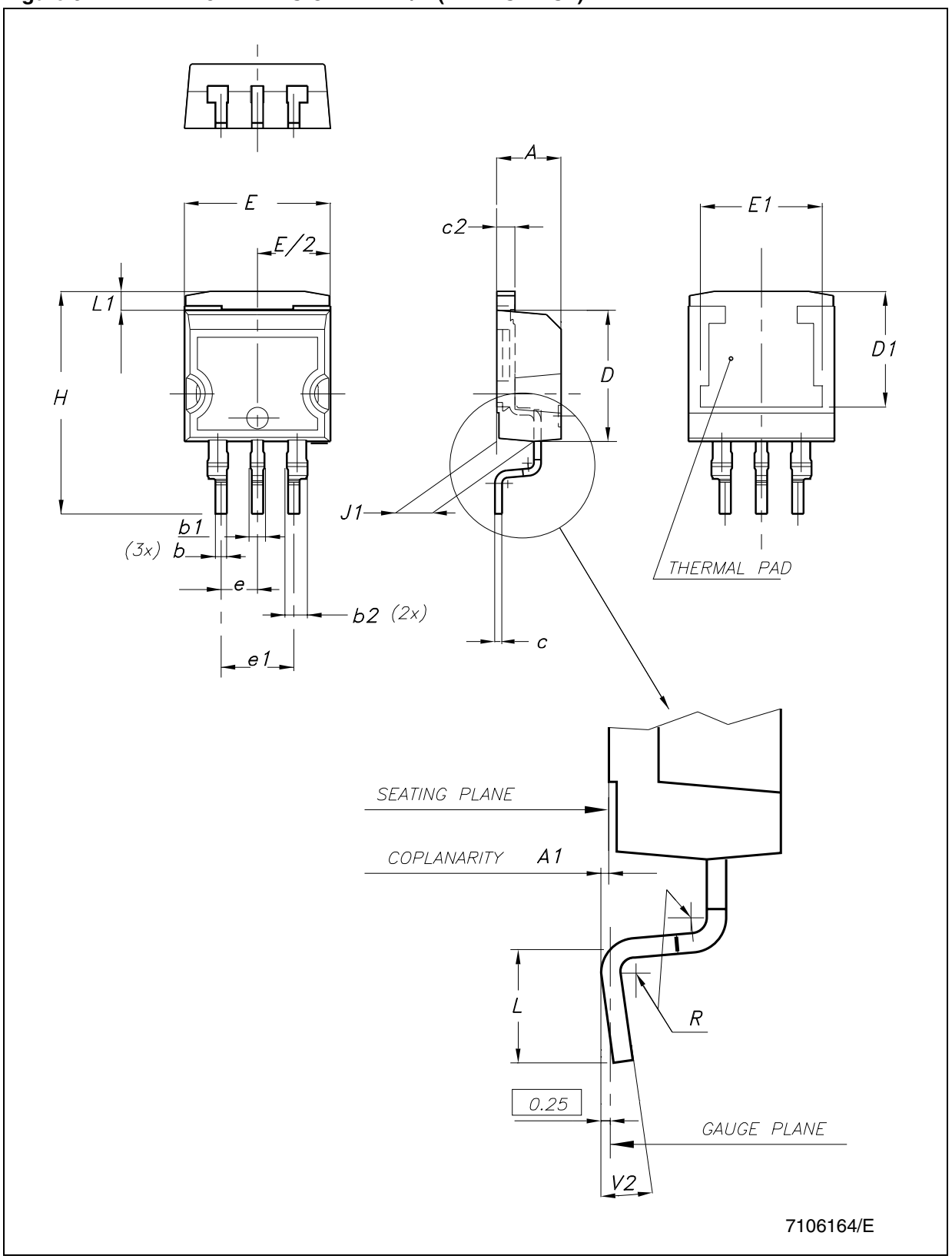


Figure 33. DRAWING DIMENSION D²PAK/A (TYPE WOOSEOK-SUBCON.)

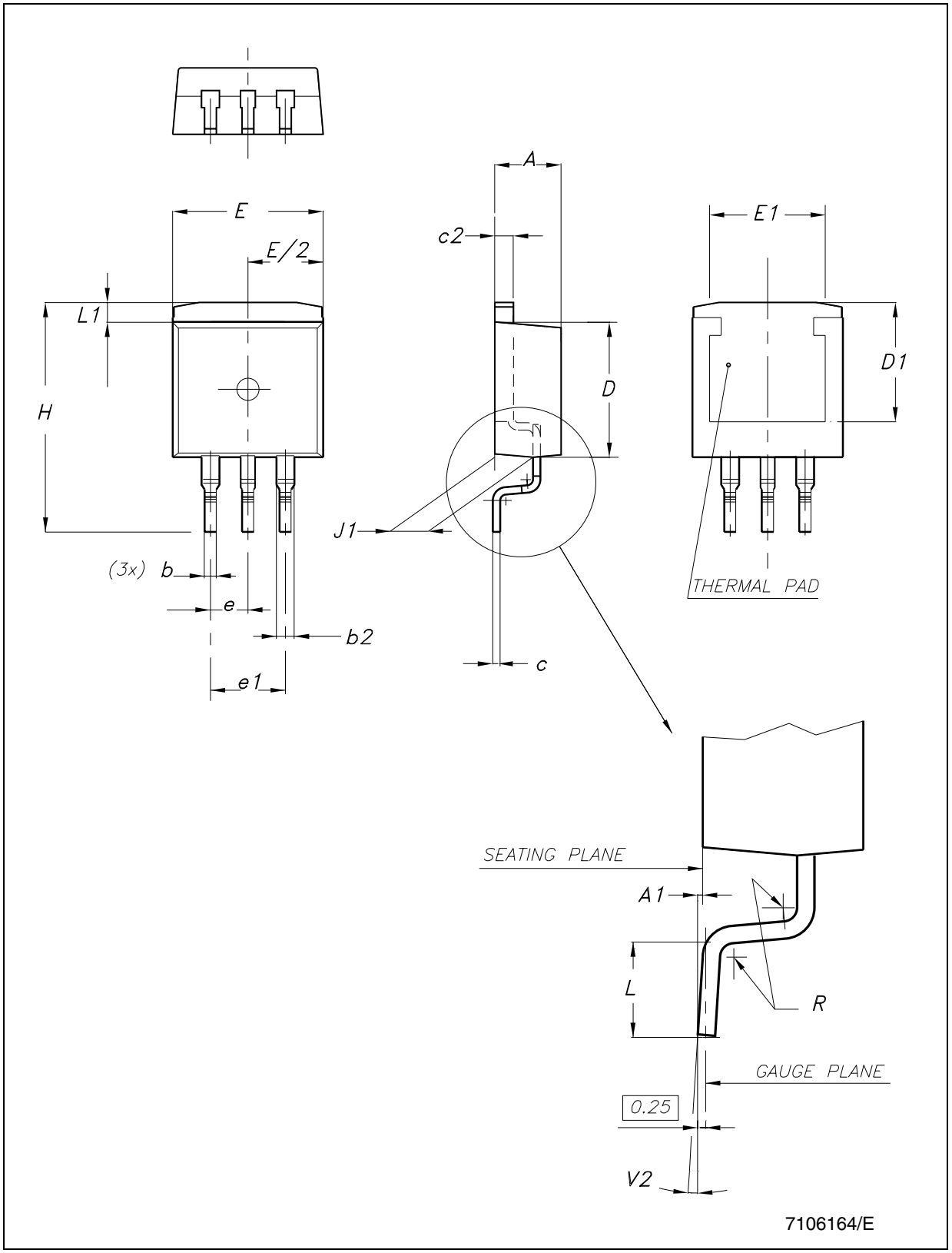


Table 15. D^2PAK/A MECHANICAL DATA

DIM.	TYPE STD-ST			TYPE WOOSEOK-SUBCON.		
	mm.			mm.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	4.30		4.70
A1	0.03		0.23	0		0.20
b	0.70		0.93	0.70		0.90
b1	0.80		1.30			
b2	1.14		1.70	1.17		1.37
c	0.45		0.60	0.45	0.50	0.60
c2	1.23		1.36	1.25	1.30	1.40
D	8.95		9.35	9	9.20	9.40
D1	7.50			7.50		
E	10		10.40	9.80		10.20
E1	8.50			7.50		
e		2.54			2.54	
e1	4.88		5.28		5.08	
H	15		15.85	15	15.30	15.60
J1	2.49		2.69	2.20		2.60
L	2.29		2.79	1.79		2.79
L1	1.27		1.40	1		1.40
R		0.4			0.30	
V2	0°		8°	0°		3°

Note: The D^2PAK/A package coming from the subcontractor Wooseok is fully compatible with the ST's package suggested footprint.

Figure 34. D²PAK/A FOOTPRINT RECOMMENDED DATA

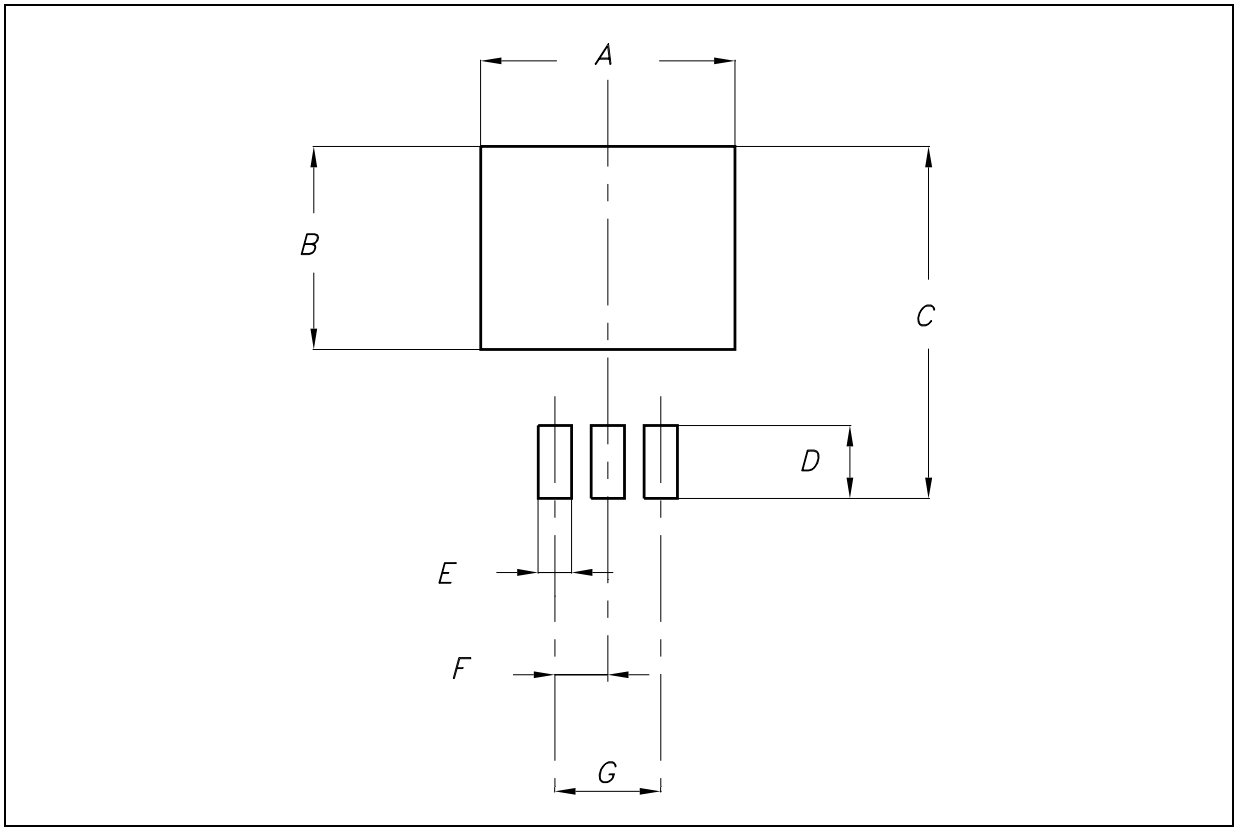
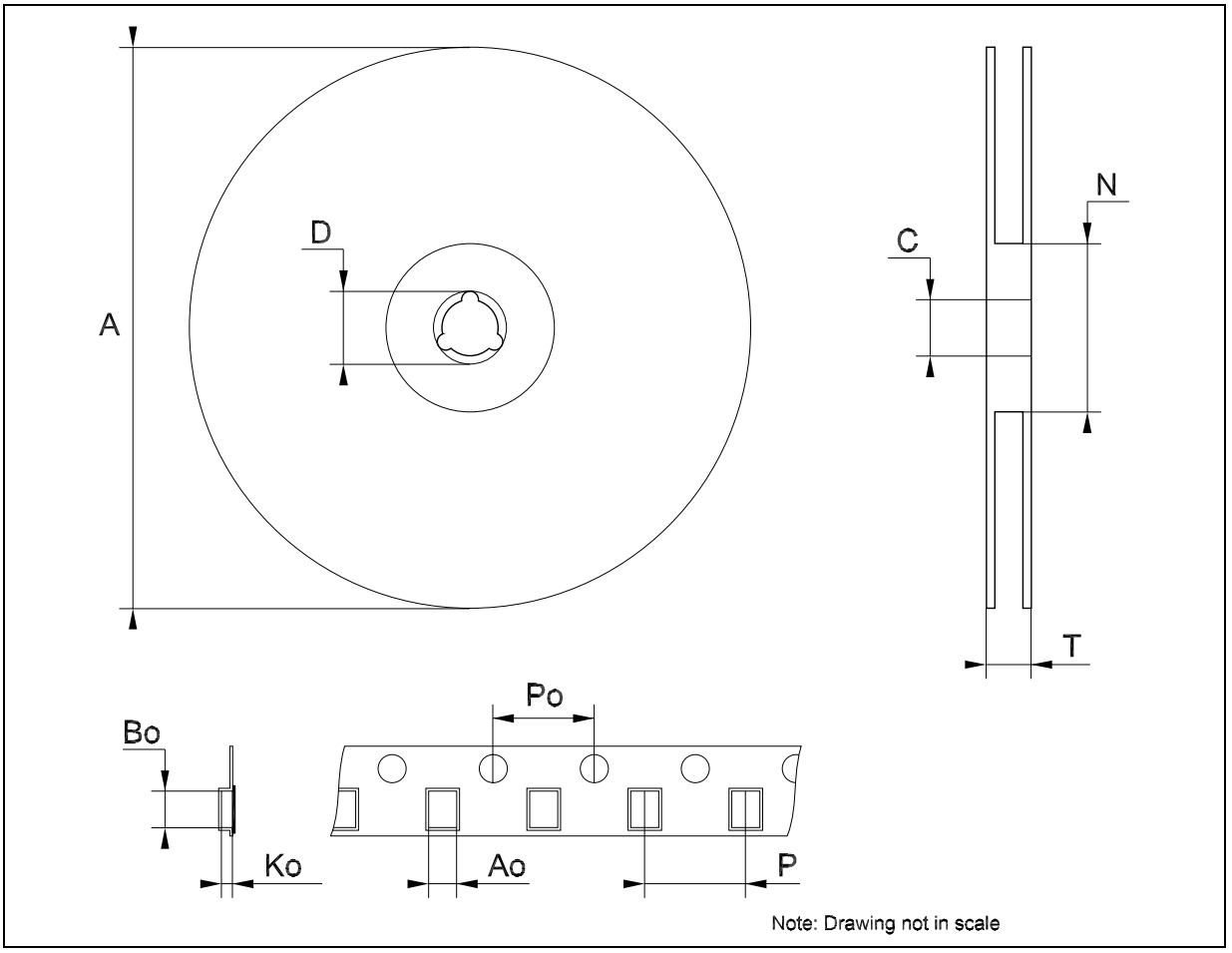


Table 16. FOOTPRINT DATA

VALUES		
	mm.	**inch.**
A	12.20	0.480
B	9.75	0.384
C	16.90	0.665
D	3.50	0.138
E	1.60	0.063
F	2.54	0.100
G	5.08	0.200

Tape & Reel DPAK-PPAK MECHANICAL DATA

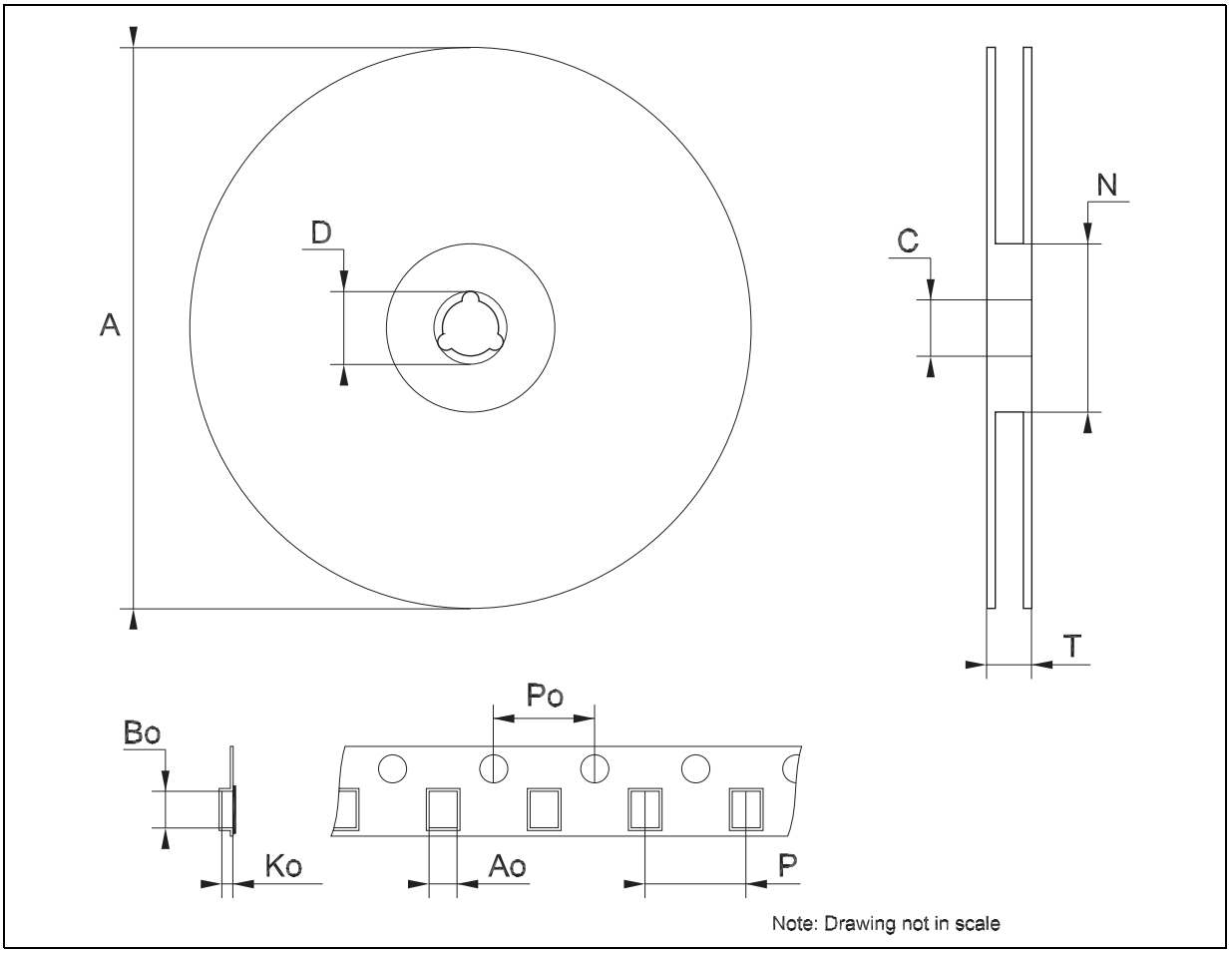
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.80	6.90	7.00	0.268	0.272	0.2.76
Bo	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	7.9	8.0	8.1	0.311	0.315	0.319



Note: Drawing not in scale

Tape & Reel D^2PAK-P^2PAK-D^2PAK/A-P^2PAK/A MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			180			7.086
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	10.50	10.6	10.70	0.413	0.417	0.421
Bo	15.70	15.80	15.90	0.618	0.622	0.626
Ko	4.80	4.90	5.00	0.189	0.193	0.197
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	11.9	12.0	12.1	0.468	0.472	0.476



Note: Drawing not in scale

7 Order code

Table 17. Order code

Part numbers				
TO-220	**D^2PAK (1)**	**D^2PAK/A (1)**	**DPAK (1)**	**Output voltage**
	LD1086D2T15R		LD1086DT15R	1.5 V
LD1086V18	LD1086D2T18	LD1086D2M18	LD1086DT18	1.8 V
LD1086V25	LD1086D2T25	LD1086D2M25	LD1086DT25	2.5 V
LD1086V33	LD1086D2T33	LD1086D2M33	LD1086DT33	3.3 V
LD1086V36	LD1086D2T36	LD1086D2M36		3.6 V
LD1086V50	LD1086D2T50	LD1086D2M50	LD1086DT50	5.0 V
LD1086V80	LD1086D2T80	LD1086D2M80	LD1086DT80	8.0 V
LD1086V90	LD1086D2T90	LD1086D2M90		9.0 V
LD1086V12	LD1086D2T12	LD1086D2M12	LD1086DT12	12.0 V
LD1086V	LD1086D2T	LD1086D2M		ADJ

1. Available in Tape & Reel with the suffix "TR"

8 Revision history

Table 18. Revision history

Date	Revision	Changes
25-Aug-2004	11	Mistake V_O (typ.), table 9 - pag. 6.
07-Oct-2004	12	Mistake order codes - Table 1.
08-Feb-2005	13	Mistake U.M. Load regulation - V ==> mV.
16-May-2006	14	Order codes has been updated and new template.
19-Jan-2007	15	D^2PAK mechanical data has been updated and add footprint data.
05-Apr-2007	16	Order codes has been updated.

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