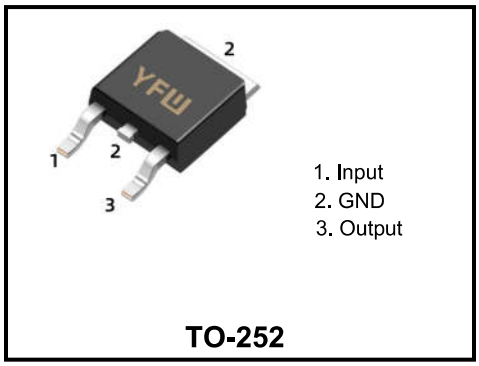
3-terminal 1.5A positive voltage regulator



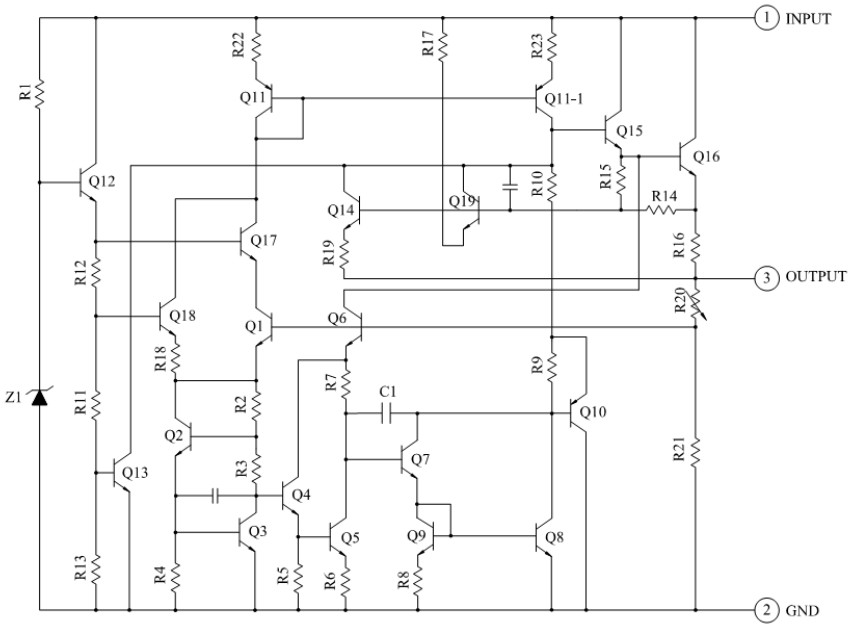
Description

The 78XXAD family is monolithic fixed voltage regulator integrated circuit. They are suitablefor applications that required supply current up to 1.5 A.

FEATURES

- Output Current up to 1.5A
- Output Voltages of 18V ,20V and 24V available
- Thermal overload shutdown protection
- Short circuit protection
- Output transistor SOA protection

Test Crcuit



Absolute Maximum Ratings

(Operating temperature range applies unless otherwise specified)

Parameter		Symbol	Value	Unit
Input Voltage	for V_O=5V~15V	V_{IN}	30	V
	for V_O=18V~24V		40	
Output Current		I_O	1.5	A
Power Dissipation		P_D	InternallyLimited	W
Operating Junction Temperature		T_{OPR}	-40 ~ + 150	℃
Storage Temperature		T_{STG}	-55 ~ + 150	℃

7818AD Electrical Characteristics

(V_I = 27V, I_O =1A,C_I = 0.33μF, C_O = 0.1μF, T_j= 0 to 125℃, unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_j = 25℃, I_O=5mA ~ 1.5A		17.3	18.0	18.7	V
		V_I = 21V ~ 33V I_O=5mA ~ 1A		17.1	18.0	18.9	V
Line Regulation	Δ V_O	T_j = 25℃ I_O= 1A	V_I = 21V ~ 33V			360	mV
			V_I = 24V ~ 30V			180	
Load Regulation	Δ V_O	T_j = 25℃,	I_O= 5mA ~ 1.5A			360	mV
			I_O= 0.25A ~ 1A			180	
Quiescent Current	I_Q	T_j = 25℃				8.0	mA
Quiescent Current Change	Δ I_Q	I_O=5mA ~ 1.5A				0.5	mA
		V_I = 21V ~ 33V				1.3	
Output Voltage Drift	ΔV /ΔT	I_O = 5mA			-1.0		mV/℃
Output Noise Voltage	V_N	10H_Z ≤ f ≤ 100KH_Z			76		μV/V_O
Ripple Rejection	RR	T_j = 25℃, V_I = 22V ~ 32V f = 120Hz, I_O = 300mA		55	71		dB
Short Circuit Current	I_{SC}	T_j=25℃			300		mA
Peak Out Current	I_{PK}	T_j=25℃			2.2		A
Dropout Voltage	V_d	T_j=25℃, I_O=500mA			2.0		V

7820AD Electrical Characteristics

(V_I = 29V, I_O = 1A,C_I = 0.33μF, C_O = 0.1μF, T_j= 0 to 125℃, unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_j = 25℃, I_O=5mA ~ 1.5A		19.2	20.0	20.8	V
		V_I = 23V ~ 35V I_O=5mA ~ 1A		19.0	20.0	21.0	V
Line Regulation	Δ V_O	T_j = 25℃ I_O= 1A	V_I = 23V ~ 35V			400	mV
			V_I = 26V ~ 32V			200	
Load Regulation	Δ V_O	T_j = 25℃,	I_O= 5mA ~ 1.5A			400	mV
			I_O= 0.25A ~ 1A			200	
Quiescent Current	I_Q	T_j = 25℃				8.0	mA
Quiescent Current Change	Δ I_Q	I_O=5mA ~ 1.5A				0.5	mA
		V_I = 23V ~ 35V				1.3	
Output Voltage Drift	ΔV /ΔT	I_O = 5mA			-1.0		mV/℃
Output Noise Voltage	V_N	10H_Z ≤ f ≤ 100KH_Z			76		μV/V_O
Ripple Rejection	RR	T_j = 25℃, V_I = 24V ~ 34V f = 120Hz, I_O = 300mA		55	71		dB
Short Circuit Current	I_{SC}	T_j=25℃			300		mA
Peak Out Current	I_{PK}	T_j=25℃			2.2		A
Dropout Voltage	V_d	T_j=25℃, I_O=500mA			2.0		V

7824AD Electrical Characteristics

(V_I = 33V, I_O =1A,C_I = 0.33μF, C_O = 0.1μF, T_j= 0 to 125℃, unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_j = 25℃, I_O=5mA ~ 1.5A		23.0	24.0	25.0	V
		V_I = 27V ~ 38V I_O=5mA ~ 1.5A		22.8	24.0	25.2	V
Line Regulation	Δ V_O	T_j = 25℃ I_O= 1A	V_I = 27V ~ 35V			400	mV
			V_I = 30V ~ 36V			200	
Load Regulation	Δ V_O	T_j = 25℃,	I_O= 5mA ~ 1.5A			400	mV
			I_O= 0.25A ~ 1A			200	
Quiescent Current	I_Q	T_j = 25℃				8.0	mA
Quiescent Current Change	Δ I_Q	I_O=5mA ~ 1.5A				0.5	mA
		V_I = 27V ~ 38V				1.3	
Output Voltage Drift	ΔV /ΔT	I_O = 5mA			-1.0		mV/℃
Output Noise Voltage	V_N	$10H_Z \le f \le 100KH_Z$			76		μV/V_O
Ripple Rejection	RR	T_j = 25℃, V_I = 28V ~ 38V f = 120Hz, I_O = 300mA		55	71		dB
Short Circuit Current	I_{SC}	T_j=25℃			300		mA
Peak Out Current	I_{PK}	T_j=25℃			2.2		A
Dropout Voltage	V_d	T_j=25℃, I_O=500mA			2.0		V

Test and Application Circuits

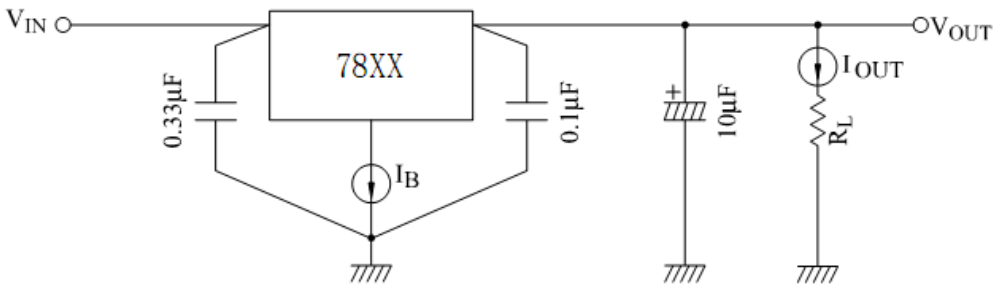


Figure 1. Test and Application Circuits

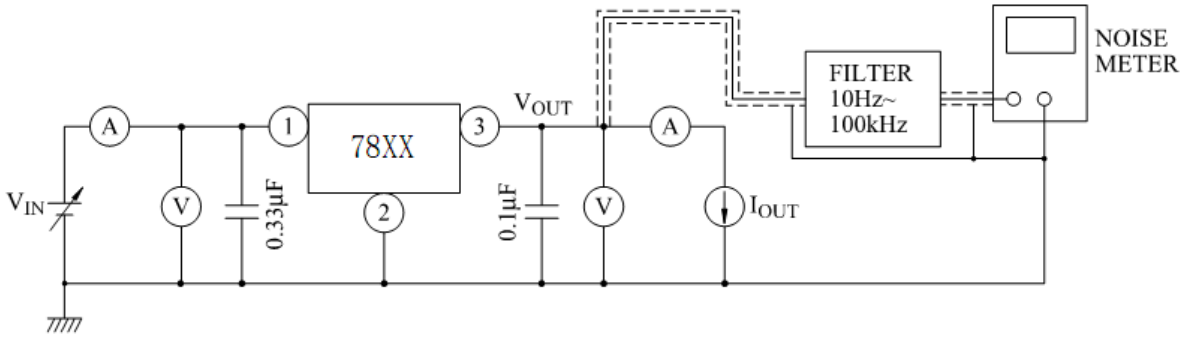


Figure 2. V_N Test Circuits

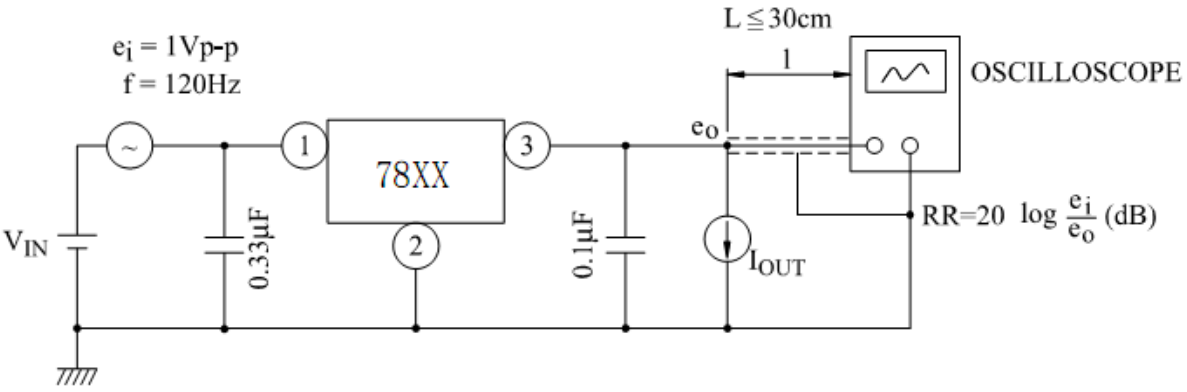


Figure 3. Ripple Rejection

Application Circuits

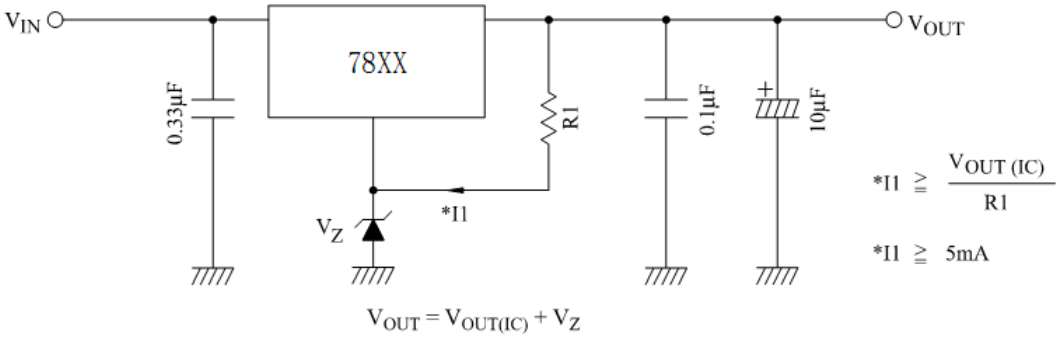


Figure 4. Voltage boost by use of zener diode

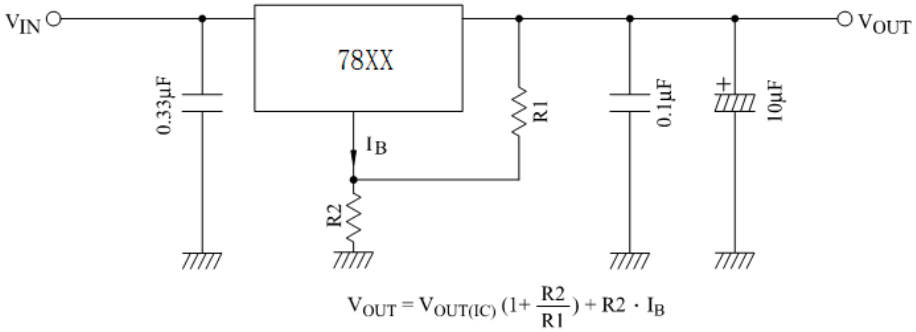


Figure 5. Voltage boost by use of resistor

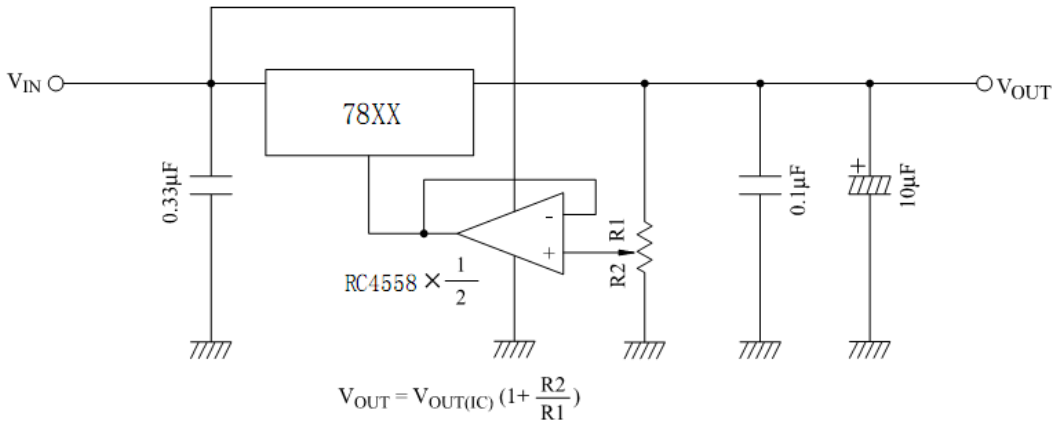


Figure 6. Adjustable output regulator

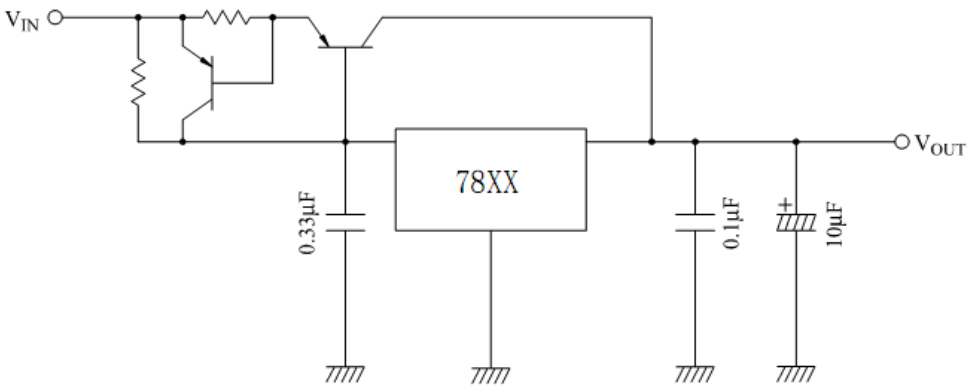


Figure 7. Current boost regulator

Typical Characteristics

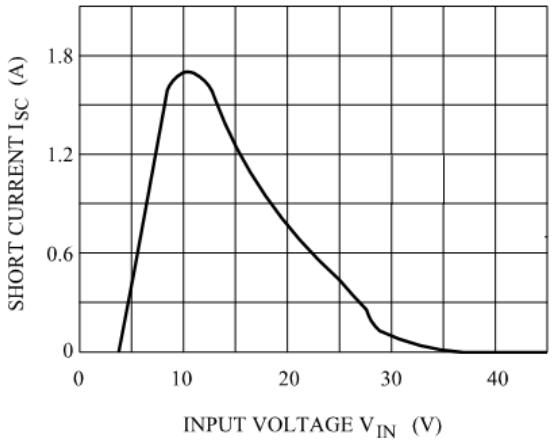


Figure 8. Peak Output Current vs Dropout Voltage

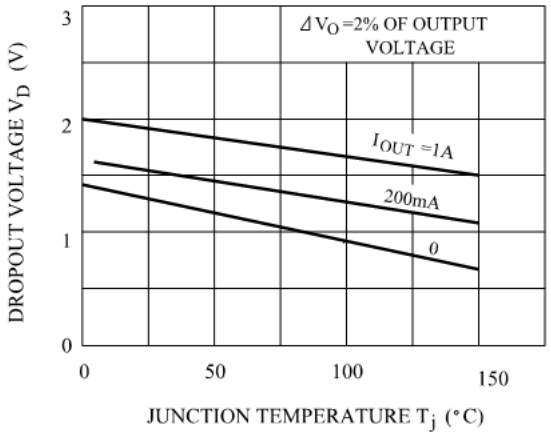


Figure 9. Dropout Voltage vs Junction Temperature

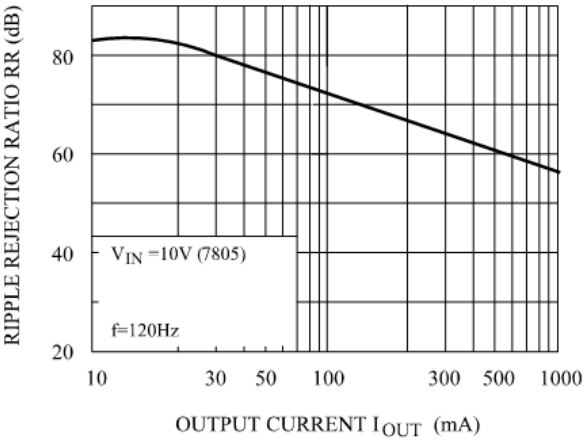


Figure 10. Ripple Rejection vs Frequency

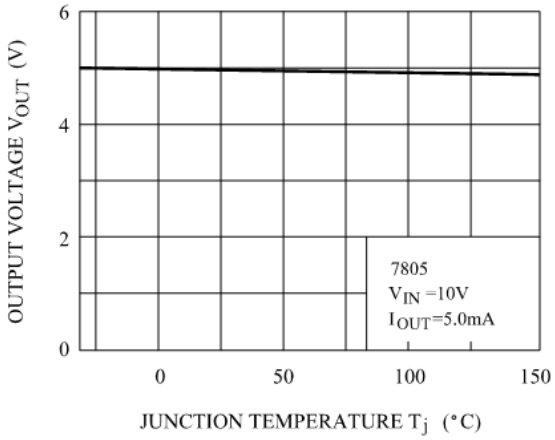


Figure 11. Output Voltage vs Junction Temperature

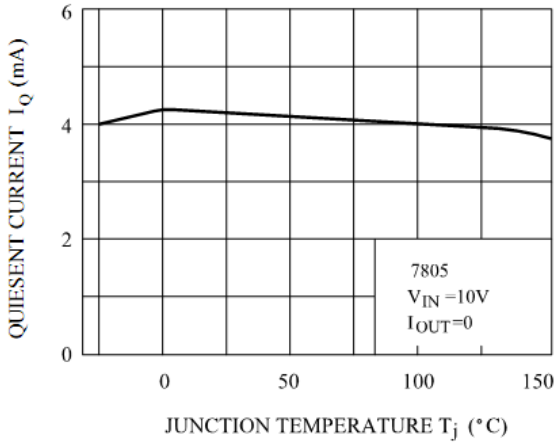


Figure 12. Quiescent Current vs Junction Temperature

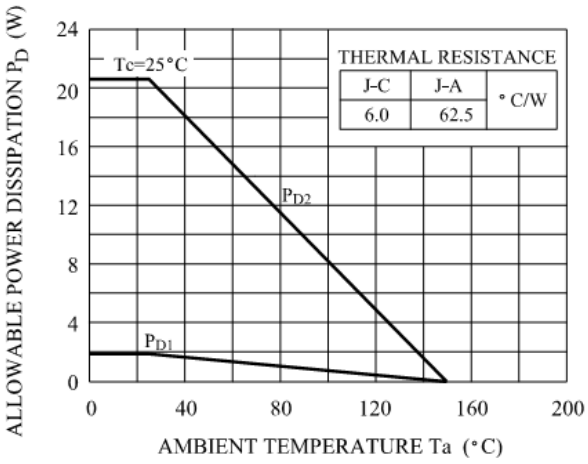
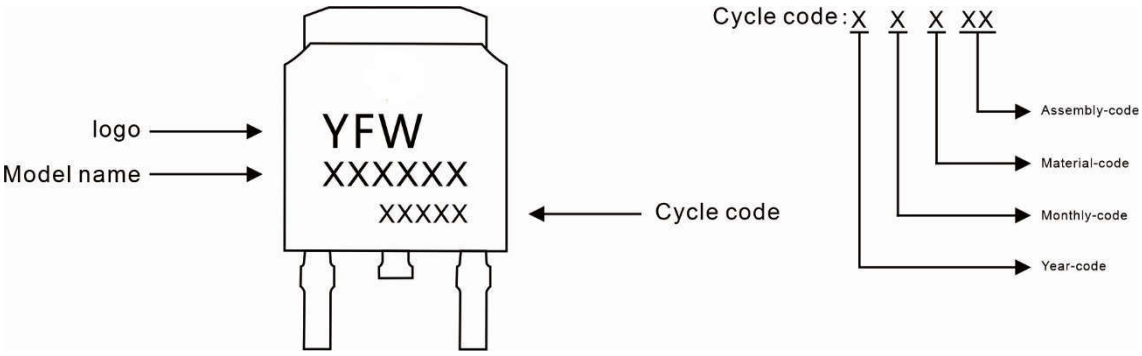


Figure 13. Power Derating

Marking Diagram

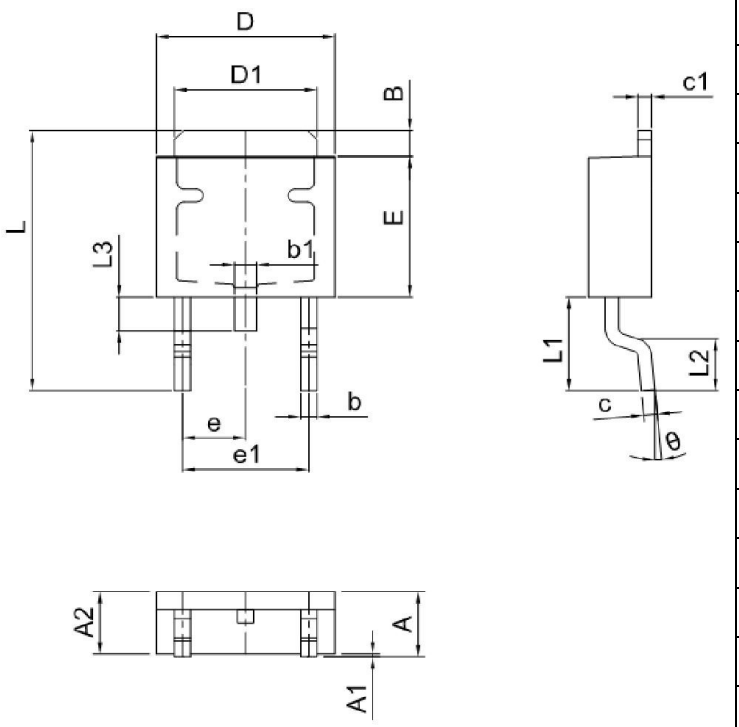


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
78XXAD	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252



Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.40	5.70	0.213	0.224
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

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