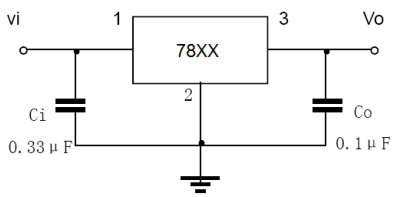
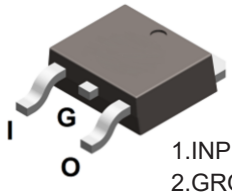
78XX

Three-Terminal Low Current Positive Voltage Regulators

FEATURES

- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Current up to 1.5A
- Satisfies IEC-65 Specification
  (International Electronical Commission)





1.INPUT
2.GROUND
3.OUTPUT

TO-252

APPLICATIONS

- Three-terminal positive voltage regulator

Ordering Information

Part Number	Package	Shipping	Marking Code
7805	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7805
7806	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7806
7807	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7807
7808	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7808
7809	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7809
7810	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7810
7812	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7812
7815	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7815
7818	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7818
7820	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7820
7824	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	7824

MAXIMUM RATING @ Ta=25℃ unless otherwise specified

Symbol	Parameter		Value	Units
V_I	Input voltage	(7805--7815) (7818--7824)	35 40	V
P_D	Power dissipation-1 Power dissipation-2	(No Heatsink) (Infinite Heatsink)	1.9 30	W
$T_{j,}$	Operating junction temperature		-40 to +125	℃
T_{stg}	Storage temperature range		-55 to +150	℃

ELECTRICAL CHARACTERISTICS (V_{IN}=10V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7805			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	4.8	5.0	5.2	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		15 5	100 50	mV
Input regulation	Reg_{Input}	T_j=25℃,7V≤V_i≤25V T_j=25℃,8V≤V_i≤12V		3 1	100 50	mV
Output voltage	V_O	7.0V≤V_i≤20V	4.75		5.25	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.2	8.0	mA
Quiescent Current Change	△I_Q	7.0V≤V_i≤25V			1.3	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		50		μV
Ripple rejection	RR	8V≤V_i≤18V,f=120Hz	62	78		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		1.6		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-0.6		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=11V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7806			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	5.75	6.0	6.25	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		15 5	120 60	mV
Input regulation	Reg_{Input}	T_j=25℃,8V≤V_i≤25V T_j=25℃,9V≤V_i≤13V		4 2	120 60	mV
Output voltage	V_O	8.0V≤V_i≤21V	5.7		6.3	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	△I_Q	8.0V≤V_i≤25V			1.3	mA

Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		55		μV
Ripple rejection	RR	9V≤V_i≤19V,f=120Hz	61	77		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		1.5		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-0.7		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=12V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7807			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	6.72	7.0	7.28	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		15 5	140 70	mV
Input regulation	Reg_{Input}	T_j=25℃,9V≤V_i≤25V T_j=25℃,10V≤V_i≤14V		5 2	140 70	mV
Output voltage	V_O	9.0V≤V_i≤22V	6.65		7.35	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	△I_Q	9.0V≤V_i≤25V			1.3	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		60		μV
Ripple rejection	RR	10V≤V_i≤20V,f=120Hz	59	75		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		1.3		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-0.8		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=14V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7808			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	7.7	8.0	8.3	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	160 80	mV
Input regulation	Reg_{Input}	T_j=25℃,10.5V≤V_i≤25V T_j=25℃,11V≤V_i≤17V		6 2	160 80	mV
Output voltage	V_O	10.5V≤V_i≤23V	7.6		8.4	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	△I_Q	10.5V≤V_i≤25V			1.0	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		70		μV
Ripple rejection	RR	11.5V≤V_i≤21.5V,f=120Hz	58	74		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		1.1		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-1.0		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=15V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7809			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	8.64	9.0	9.36	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	180 90	mV
Input regulation	Reg_{Input}	T_j=25℃,11.5V≤V_i≤26V T_j=25℃,13V≤V_i≤19V		7 2.5	180 90	mV
Output voltage	V_O	11.5V≤V_i≤26V	8.55		9.45	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	△I_Q	11.5V≤V_i≤26V			1.0	mA

Output noise voltage	V_N	T_a=25℃,10Hz≤f≤100KHz		75		μV
Ripple rejection	RR	12.5V≤V_i≤22.5V,f=120Hz	56	72		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		1.0		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-1.1		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=16V,I_O=500mA, 0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7810			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	9.6	10.0	10.4	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	200 100	mV
Input regulation	Reg_{Input}	T_j=25℃,12.5V≤V_i≤27V T_j=25℃,14V≤V_i≤20V		8 2.5	200 100	mV
Output voltage	V_O	12.5V≤V_i≤25V	9.5		10.5	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	$\triangle I_Q$	12.5V≤V_i≤27V			1.0	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		80		μV
Ripple rejection	RR	13.5V≤V_i≤23.5V,f=120Hz	55	72		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.9		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-1.3		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=19V,I_O=500mA,0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7812			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	11.5	12.0	12.5	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	240 120	mV
Input regulation	Reg_{Input}	T_j=25℃,14.5V≤V_i≤30V T_j=25℃,16V≤V_i≤22V		10 3	240 120	mV
Output voltage	V_O	14.5V≤V_i≤27V	11.4		12.6	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.3	8.0	mA
Quiescent Current Change	△I_Q	14.5V≤V_i≤30V			1.0	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		90		μV
Ripple rejection	RR	15V≤V_i≤25V,f=120Hz	55	71		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.7		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-1.6		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=23V,I_O=500mA,0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7815			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	14.4	15.0	15.6	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	300 150	mV
Input regulation	Reg_{Input}	T_j=25℃,17.5V≤V_i≤30V T_j=25℃,20V≤V_i≤26V		11 3	300 150	mV
Output voltage	V_O	17.5V≤V_i≤30V	14.25		15.75	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.4	8.0	mA
Quiescent Current Change	△I_Q	17.5V≤V_i≤30V			1.0	mA

Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		110		μV
Ripple rejection	RR	18.5V≤V_i≤28.5V,f=120Hz	54	70		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.5		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-2.0		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=27V,I_O=500mA,0℃≤T_j≤125℃)

Parameter	Symbol	Test conditions	7818			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	17.3	18.0	18.7	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	360 180	mV
Input regulation	Reg_{Input}	T_j=25℃,21V≤V_i≤33V T_j=25℃,24V≤V_i≤30V		13 4	360 180	mV
Output voltage	V_O	21V≤V_i≤33V	17.1		18.9	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.5	8.0	mA
Quiescent Current Change	△I_Q	21V≤V_i≤33V			1.0	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		125		μV
Ripple rejection	RR	22V≤V_i≤32V,f=120Hz	52	68		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.4		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-2.5		mv/℃

ELECTRICAL CHARACTERISTICS (V_{IN}=29V,I_O=500mA,0℃≤T_j≤125℃)

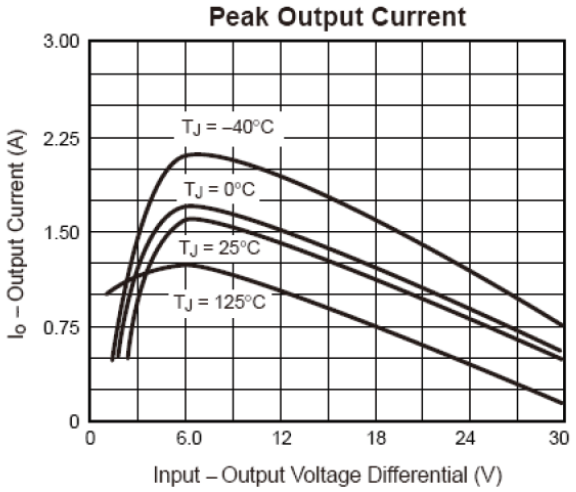
Parameter	Symbol	Test conditions	7820			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	19.2	20.0	20.8	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	400 200	mV
Input regulation	Reg_{Input}	T_j=25℃,23V≤V_i≤35V T_j=25℃,26V≤V_i≤32V		15 5	400 200	mV
Output voltage	V_O	23V≤V_i≤35V	19.0		21.0	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.6	8.0	mA
Quiescent Current Change	△I_Q	23V≤V_i≤35V			1.0	mA
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		135		μV
Ripple rejection	RR	24V≤V_i≤34V,f=120Hz	50	66		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.4		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-3.0		mv/℃

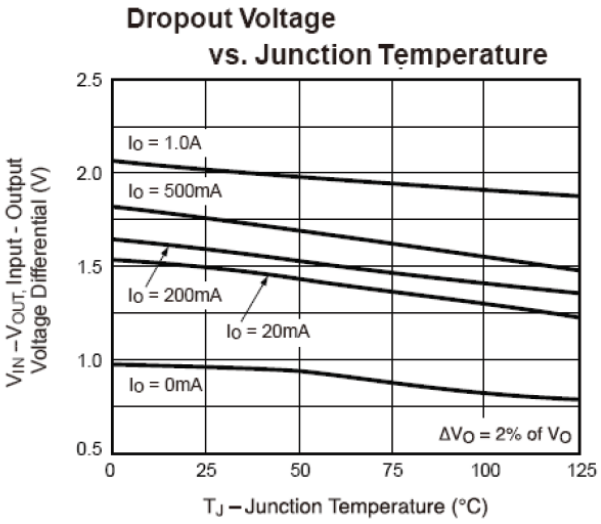
ELECTRICAL CHARACTERISTICS (V_{IN}=33V,I_O=500mA,0℃≤T_j≤125℃)

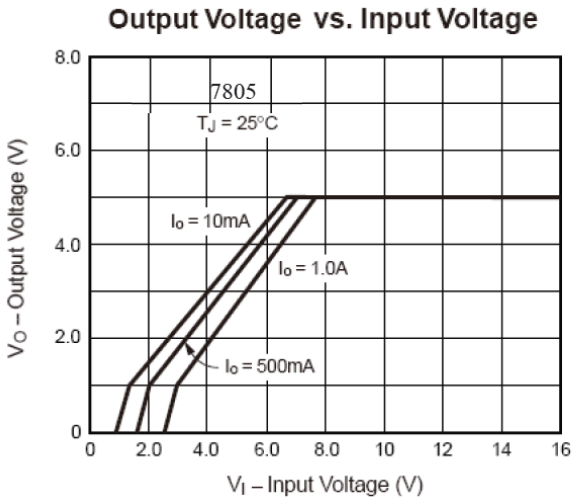
Parameter	Symbol	Test conditions	7824			UNIT
			MIN	TYP	MAX	
Output voltage	V_O	T_j=25℃,I_O=100mA	23.0	24.0	25.0	V
Load regulation	Reg_{load}	T_j=25℃, I_O=5mA-1.5A T_j=25℃, I_O=250mA-750mA		12 4	480 240	mV
Input regulation	Reg_{Input}	T_j=25℃,27V≤V_i≤38V T_j=25℃,30V≤V_i≤36V		18 6	480 240	mV
Output voltage	V_O	27V≤V_i≤38V	22.8		25.2	V
Quiescent Current	I_Q	T_j=25℃,I_O=5mA		4.6	8.0	mA
Quiescent Current Change	△I_Q	27V≤V_i≤38V			1.0	mA

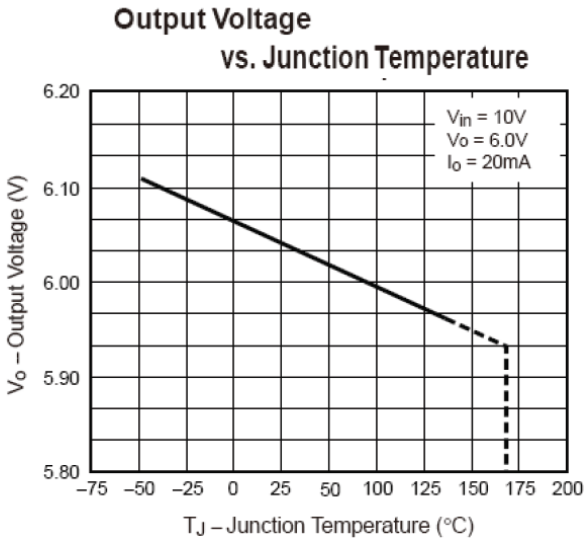
Output noise voltage	V_N	T_a=25℃,10Hz ≤f≤100KHz		150		μV
Ripple rejection	RR	28V≤V_i≤38V,f=120Hz	50	66		dB
Dropout voltage	V_D	T_j=25℃,I_O=1.0A		2.0		V
Short Circuit Current Limit	I_{SC}	T_j=25℃		0.3		A
Average temperature coefficient Of Output voltage	TC_{VO}	0℃≤T_j≤125℃,I_O=5mA		-3.5		mv/℃

TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified



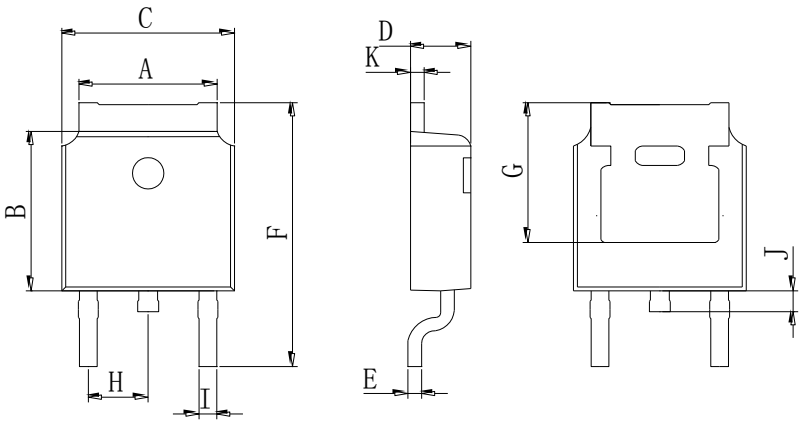






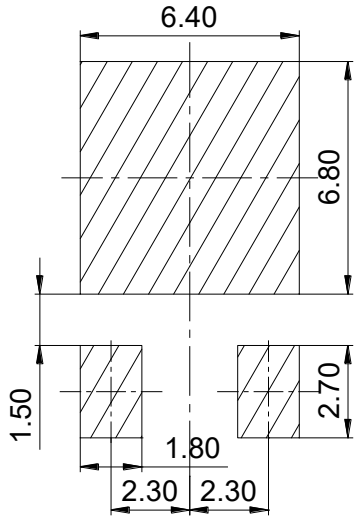
PACKAGE OUTLINE

Plastic surface mounted package TO-252



TO-252		
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.7
K	0.40	0.60
All Dimensions in mm		

SOLDERING FOOTPRINT



Unit: mm