

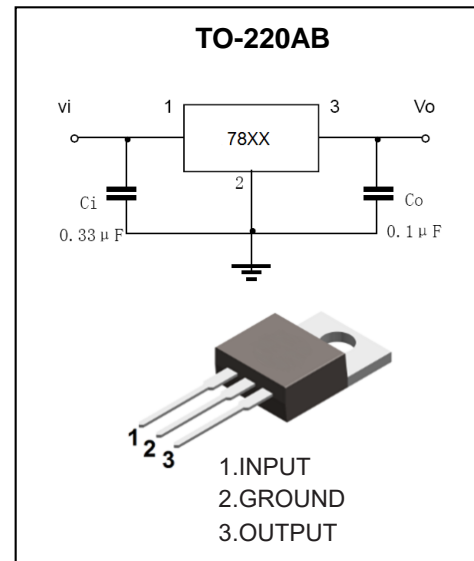


FEATURES

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

APPLICATIONS

- Three-terminal positive voltage regulator



Ordering Information

Part Number	Package	Shipping	Marking Code
7805	TO-220AB	50 pcs / Tube	7805
7806	TO-220AB	50 pcs / Tube	7806
7807	TO-220AB	50 pcs / Tube	7807
7808	TO-220AB	50 pcs / Tube	7808
7809	TO-220AB	50 pcs / Tube	7809
7810	TO-220AB	50 pcs / Tube	7810
7812	TO-220AB	50 pcs / Tube	7812
7815	TO-220AB	50 pcs / Tube	7815
7818	TO-220AB	50 pcs / Tube	7818
7820	TO-220AB	50 pcs / Tube	7820
7824	TO-220AB	50 pcs / Tube	7824



MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
V _I	Input voltage (7805--7815)	35	V
	(7818--7824)	40	
P _D	Power dissipation-1 (No Heatsink)	1.9	W
	Power dissipation-2 (Infinite Heatsink)	30	
T _{OPR}	Operating Temperature Range	-40 ~ +125	°C
T _J	Junction Temperature	150	
T _{STG}	Storage Temperature Range	-55 ~ +150	°C

ELECTRICAL CHARACTERISTICS (V_{IN}=10V, I_O=500mA, 0°C ≤ T_J ≤ 125°C)

Parameter	Symbol	Test conditions	7805			UNIT
			MIN	TYP	MAX	
Output voltage	V _O	T _J =25°C, I _O =100mA	4.8	5.0	5.2	V
Load regulation	Reg _{load}	T _J =25°C, I _O =5mA-1.5A T _J =25°C, I _O =250mA-750mA		15 5	100 50	mV
Input regulation	Reg _{input}	T _J =25°C, 7V ≤ V _I ≤ 25V T _J =25°C, 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°C, I _O =5mA		4.2	8.0	mA
Quiescent Current Change	ΔI _Q	7.0V ≤ V _I ≤ 25V			1.3	mA
Output noise voltage	V _N	T _a =25°C, 10Hz ≤ f ≤ 100KHz		50		μV
Ripple rejection	RR	8V ≤ V _I ≤ 18V, f=120Hz	62	78		dB
Dropout voltage	V _D	T _J =25°C, I _O =1.0A		2.0		V
Short Circuit Current Limit	I _{SC}	T _J =25°C		1.6		A
Average temperature coefficient Of Output voltage	TC _{VO}	0°C ≤ T _J ≤ 125°C, I _O =5mA		-0.6		mv/°C



ELECTRICAL CHARACTERISTICS ($V_{IN}=11V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

Parameter	Symbol	Test conditions	7806			UNIT
			MIN	TYP	MAX	
Output voltage	V_o	$T_j=25^{\circ}C, I_o=100mA$	5.75	6.0	6.25	V
Load regulation	Reg_{load}	$T_j=25^{\circ}C, I_o=5mA-1.5A$		15	120	mV
		$T_j=25^{\circ}C, I_o=250mA-750mA$		5	60	
Input regulation	Reg_{Input}	$T_j=25^{\circ}C, 8V \leq V_i \leq 25V$		4	120	mV
		$T_j=25^{\circ}C, 9V \leq V_i \leq 13V$		2	60	
Output voltage	V_o	$8.0V \leq V_i \leq 21V$	5.7		6.3	V
Quiescent Current	I_q	$T_j=25^{\circ}C, I_o=5mA$		4.3	8.0	mA
Quiescent Current Change	ΔI_q	$8.0V \leq V_i \leq 25V$			1.3	mA
Output noise voltage	V_N	$T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$		55		μV
Ripple rejection	RR	$9V \leq V_i \leq 19V, f=120Hz$	61	77		dB
Dropout voltage	V_D	$T_j=25^{\circ}C, I_o=1.0A$		2.0		V
Short Circuit Current Limit	I_{SC}	$T_j=25^{\circ}C$		1.5		A
Average temperature coefficient Of Output voltage	TC_{V_o}	$0^{\circ}C \leq T_j \leq 125^{\circ}C, I_o=5mA$		-0.7		mv/ $^{\circ}C$

ELECTRICAL CHARACTERISTICS ($V_{IN}=12V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

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



ELECTRICAL CHARACTERISTICS ($V_{IN}=14V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

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

ELECTRICAL CHARACTERISTICS ($V_{IN}=15V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

Parameter	Symbol	Test conditions	7809			UNIT
			MIN	TYP	MAX	
Output voltage	V_o	$T_j=25^{\circ}C, I_o=100mA$	8.64	9.0	9.36	V
Load regulation	Reg_{load}	$T_j=25^{\circ}C, I_o=5mA-1.5A$		12	180	mV
		$T_j=25^{\circ}C, I_o=250mA-750mA$		4	90	
Input regulation	Reg_{Input}	$T_j=25^{\circ}C, 11.5V \leq V_i \leq 26V$		7	180	mV
		$T_j=25^{\circ}C, 13V \leq V_i \leq 19V$		2.5	90	
Output voltage	V_o	$11.5V \leq V_i \leq 26V$	8.55		9.45	V
Quiescent Current	I_q	$T_j=25^{\circ}C, I_o=5mA$		4.3	8.0	mA
Quiescent Current Change	ΔI_q	$11.5V \leq V_i \leq 26V$			1.0	mA
Output noise voltage	V_N	$T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$		75		μV
Ripple rejection	RR	$12.5V \leq V_i \leq 22.5V, f=120Hz$	56	72		dB
Dropout voltage	V_D	$T_j=25^{\circ}C, I_o=1.0A$		2.0		V
Short Circuit Current Limit	I_{sc}	$T_j=25^{\circ}C$		1.0		A
Average temperature coefficient Of Output voltage	TC_{V_o}	$0^{\circ}C \leq T_j \leq 125^{\circ}C, I_o=5mA$		-1.1		mv/ $^{\circ}C$



ELECTRICAL CHARACTERISTICS ($V_{IN}=16V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

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

ELECTRICAL CHARACTERISTICS ($V_{IN}=19V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

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



ELECTRICAL CHARACTERISTICS ($V_{IN}=23V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

Parameter	Symbol	Test conditions	7815			UNIT
			MIN	TYP	MAX	
Output voltage	V_o	$T_j=25^{\circ}C, I_o=100mA$	14.4	15.0	15.6	V
Load regulation	Reg_{load}	$T_j=25^{\circ}C, I_o=5mA-1.5A$		12	300	mV
		$T_j=25^{\circ}C, I_o=250mA-750mA$		4	150	
Input regulation	Reg_{Input}	$T_j=25^{\circ}C, 17.5V \leq V_i \leq 30V$		11	300	mV
		$T_j=25^{\circ}C, 20V \leq V_i \leq 26V$		3	150	
Output voltage	V_o	$17.5V \leq V_i \leq 30V$	14.25		15.75	V
Quiescent Current	I_q	$T_j=25^{\circ}C, I_o=5mA$		4.4	8.0	mA
Quiescent Current Change	ΔI_q	$17.5V \leq V_i \leq 30V$			1.0	mA
Output noise voltage	V_N	$T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$		110		μV
Ripple rejection	RR	$18.5V \leq V_i \leq 28.5V, f=120Hz$	54	70		dB
Dropout voltage	V_D	$T_j=25^{\circ}C, I_o=1.0A$		2.0		V
Short Circuit Current Limit	I_{SC}	$T_j=25^{\circ}C$		0.5		A
Average temperature coefficient Of Output voltage	TC_{V_o}	$0^{\circ}C \leq T_j \leq 125^{\circ}C, I_o=5mA$		-2.0		mv/ $^{\circ}C$

ELECTRICAL CHARACTERISTICS ($V_{IN}=27V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

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



ELECTRICAL CHARACTERISTICS ($V_{IN}=29V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

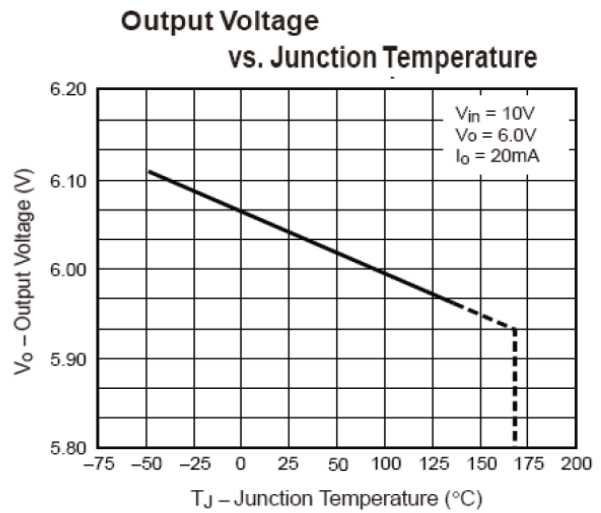
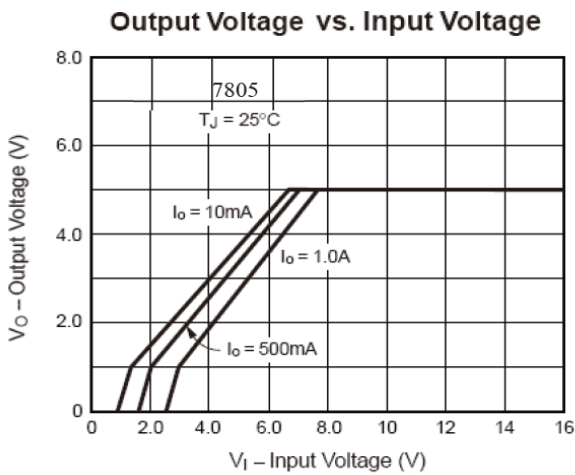
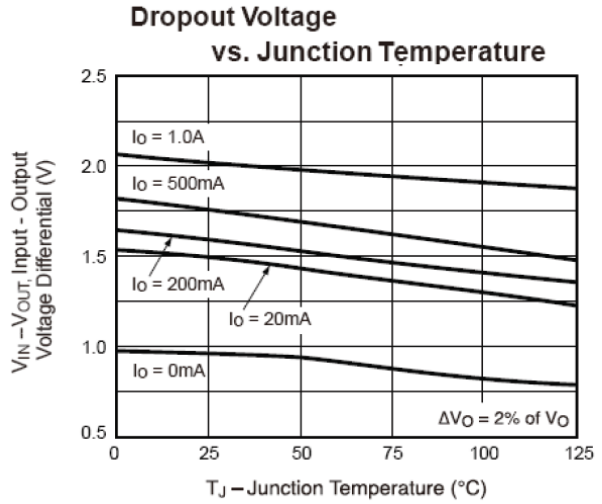
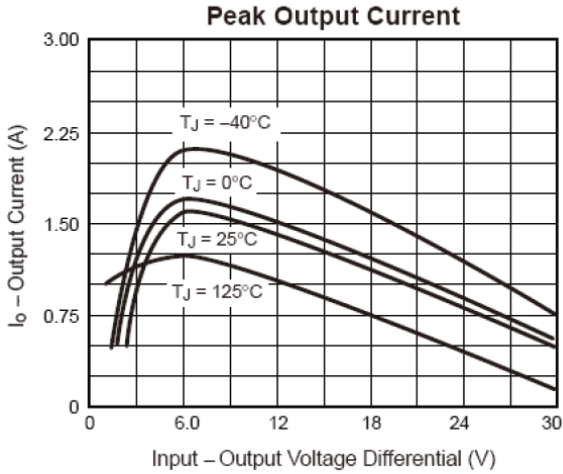
Parameter	Symbol	Test conditions	7820			UNIT
			MIN	TYP	MAX	
Output voltage	V_o	$T_j=25^{\circ}C, I_o=100mA$	19.2	20.0	20.8	V
Load regulation	Reg_{load}	$T_j=25^{\circ}C, I_o=5mA-1.5A$		12	400	mV
		$T_j=25^{\circ}C, I_o=250mA-750mA$		4	200	
Input regulation	Reg_{Input}	$T_j=25^{\circ}C, 23V \leq V_i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

ELECTRICAL CHARACTERISTICS ($V_{IN}=33V, I_o=500mA, 0^{\circ}C \leq T_j \leq 125^{\circ}C$)

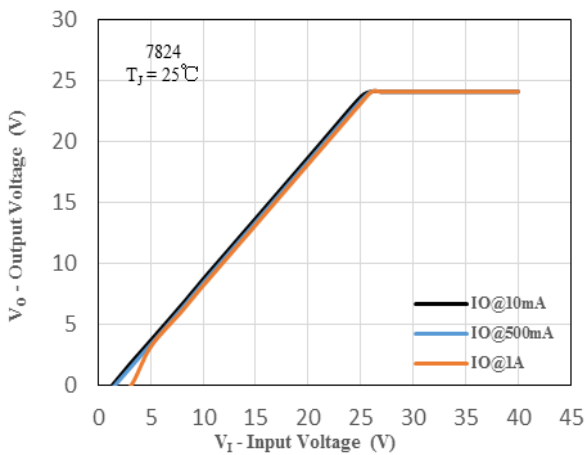
Parameter	Symbol	Test conditions	7824			UNIT
			MIN	TYP	MAX	
Output voltage	V_o	$T_j=25^{\circ}C, I_o=100mA$	23.0	24.0	25.0	V
Load regulation	Reg_{load}	$T_j=25^{\circ}C, I_o=5mA-1.5A$		12	480	mV
		$T_j=25^{\circ}C, I_o=250mA-750mA$		4	240	
Input regulation	Reg_{Input}	$T_j=25^{\circ}C, 27V \leq V_i \leq 38V$		18	480	mV
		$T_j=25^{\circ}C, 30V \leq V_i \leq 36V$		6	240	
Output voltage	V_o	$27V \leq V_i \leq 38V$	22.8		25.2	V
Quiescent Current	I_q	$T_j=25^{\circ}C, I_o=5mA$		4.6	8.0	mA
Quiescent Current Change	ΔI_q	$27V \leq V_i \leq 38V$			1.0	mA
Output noise voltage	V_N	$T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$		150		μV
Ripple rejection	RR	$28V \leq V_i \leq 38V, f=120Hz$	50	66		dB
Dropout voltage	V_D	$T_j=25^{\circ}C, I_o=1.0A$		2.0		V
Short Circuit Current Limit	I_{sc}	$T_j=25^{\circ}C$		0.3		A
Average temperature coefficient Of Output voltage	TC_{V_o}	$0^{\circ}C \leq T_j \leq 125^{\circ}C, I_o=5mA$		-3.5		mv/ $^{\circ}C$



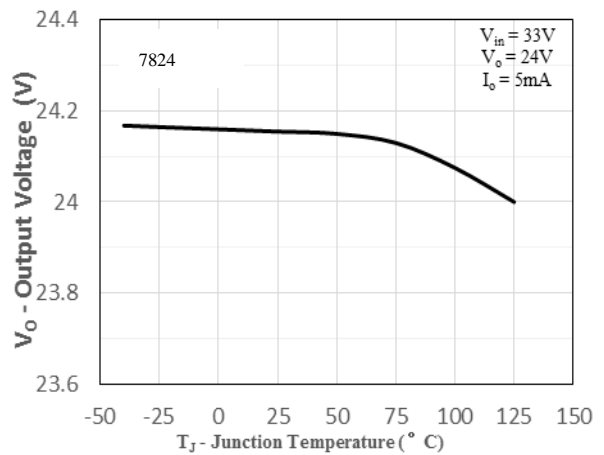
TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified



Output Voltage vs. Input Voltage



Output Voltage vs. Junction Temperature

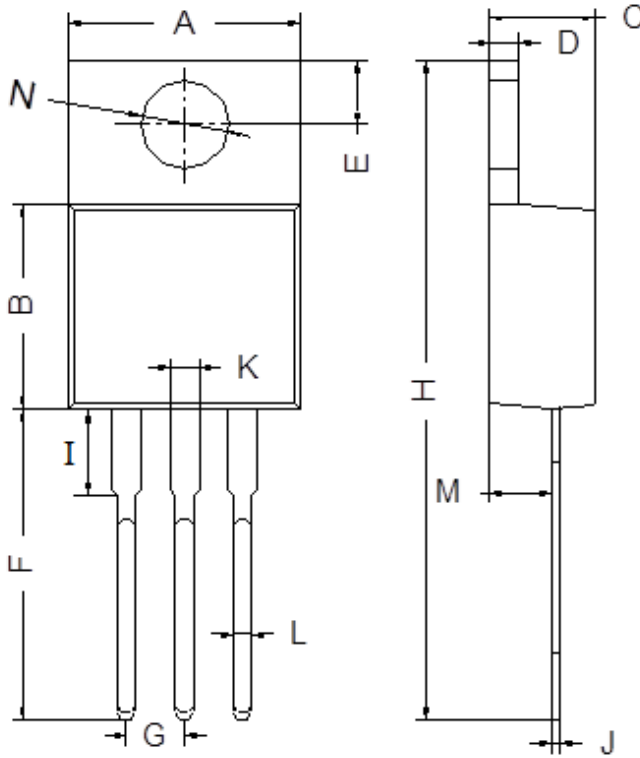




PACKAGE OUTLINE

Plastic surface mounted package

TO-220AB



TO-220AB		
Dim	Min	Max
A	9.80	10.30
B	8.70	9.10
C	4.37	4.77
D	1.07	1.47
E	2.64	2.84
F	13.14	13.74
G	2.44	2.64
H	28.03	28.83
I	3.50	4.00
J	0.28	0.48
K	1.22	1.32
L	0.71	0.91
M	2.40	2.60
N	3.76	3.96
All Dimensions in mm		