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GU78XXA

3-TERMINAL POSITIVE VOLTAGE REGULATORS

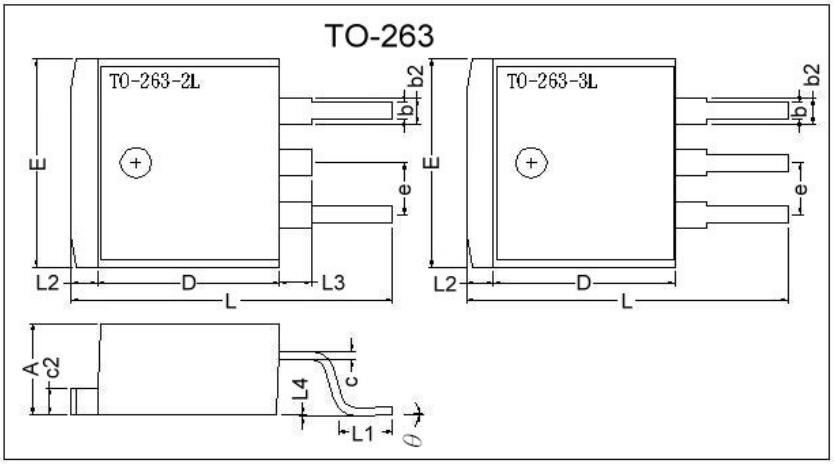
Description

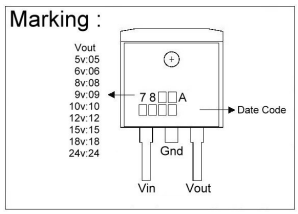
The GU78XXA series of fixed-voltage monolithic integrated-circuit voltage regulators designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators can deliver up to 1.5 amperes of output current. The internal current limiting and thermal shutdown features of these regulators make them essentially immune to overload.

Features

- 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 24V output voltage available
- Internal Thermal Overload Protection
- High Power Dissipation Capability
- Internal Short-Circuit Current Limiting
- No External Components
- Output Transistor Safe-Area Compensation

Package Dimensions





REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c2	1.25	1.45
b	0.76	1.00	b2	1.17	1.47
L4	0.00	0.30	D	8.6	9.0
c	0.36	0.5	e	2.54 REF.	
L3	1.50 REF.		L	14.6	15.8
L1	2.29	2.79	θ	0°	8°
E	9.80	10.4	L2	1.27 REF.	

Absolute Maximum Ratings

Parameter		Ratings	Unit
Input voltage	GU7805A ~ 18A	35V	V
	GU7824A	40V	V
Output current		1.5	A
Operating junction temperature range		0 ~ 150	℃
Storage temperature range		-55 ~ 150	℃
Thermal resistance junction-air (RθJA)		65	℃/W
Thermal resistance junction-cases (RθJC)		5	℃/W

Electrical Characteristics

GU7805A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=10V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	4.85	5.0	5.15	V	Vin=10V, Io=500mA, Tj=25℃ 7.5V ≤ Vin ≤ 20V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	4.75	-	5.25		
ΔVO (Line Regulation)		-	3	100	mV	7V ≤ Vin ≤ 25V, Io=500mA, Tj=25℃
		-	1	50		8V ≤ Vin ≤ 12V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	15	100	mV	Vin=10V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	5	50		Vin=10V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.2	8.0	mA	Vin=10V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=10V, 5mA ≤ Io ≤ 1A
		-	-	1.3		7V ≤ Vin ≤ 25V, Io=500mA
Vn		-	40	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		62	-	-	dB	8V ≤ Vin ≤ 18V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	750	-	mA	Vin=10V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.1	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7806A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=11V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	5.82	6.0	6.18	V	Vin=11V, Io=500mA, Tj=25℃ 8V ≤ Vin ≤ 21V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	5.70	-	6.30		
ΔVO (Line Regulation)		-	5	120	mV	8V ≤ Vin ≤ 25V, Io=500mA, Tj=25℃
		-	1.5	60		9V ≤ Vin ≤ 13V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	14	120	mV	Vin=11V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	60		Vin=11V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=11V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=11V, 5mA ≤ Io ≤ 1A
		-	-	1.3		8V ≤ Vin ≤ 25V, Io=500mA
Vn		-	45	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		59	-	-	dB	9V ≤ Vin ≤ 19V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	550	-	mA	Vin=11V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.8	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7808A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=14V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	7.76	8.0	8.24	V	Vin=14V, Io=500mA, Tj=25℃ 10.5V ≤ Vin ≤ 23V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	7.60	-	8.40		
ΔVO (Line Regulation)		-	6	160	mV	10.5V ≤ Vin ≤ 25V, Io=500mA, Tj=25℃
		-	2	80		11V ≤ Vin ≤ 17V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	160	mV	Vin=14V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	80		Vin=14V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=14V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=14V, 5mA ≤ Io ≤ 1A
		-	-	1.0		10.5V ≤ Vin ≤ 25V, Io=500mA
Vn		-	52	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		55	-	-	dB	11.5V ≤ Vin ≤ 21.5V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	450	-	mA	Vin=14V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.8	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7809A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=16V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	8.73	9.0	9.27	V	Vin=16V, Io=500mA, Tj=25℃ 11.5V ≤ Vin ≤ 24V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	8.55	-	9.45		
ΔVO (Line Regulation)		-	7	180	mV	11.5V ≤ Vin ≤ 27V, Io=500mA, Tj=25℃
		-	2	90		13V ≤ Vin ≤ 19V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	180	mV	Vin=16V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	90		Vin=16V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=16V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=16V, 5mA ≤ Io ≤ 1A
		-	-	1.0		11.5V ≤ Vin ≤ 27V, Io=500mA
Vn		-	60	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		55	-	-	dB	12V ≤ Vin ≤ 22V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	400	-	mA	Vin=16V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7810A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=17V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	9.70	10.0	10.30	V	Vin=17V, Io=500mA, Tj=25℃ 12.5V ≤ Vin ≤ 25V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	9.50	-	10.50		
ΔVO (Line Regulation)		-	7	200	mV	12.5V ≤ Vin ≤ 28V, Io=500mA, Tj=25℃
		-	2	100		14V ≤ Vin ≤ 20V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	200	mV	Vin=17V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	100		Vin=17V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=17V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=17V, 5mA ≤ Io ≤ 1A
		-	-	1.0		12.5V ≤ Vin ≤ 28V, Io=500mA
Vn		-	70	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		55	-	-	dB	13V ≤ Vin ≤ 23V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	400	-	mA	Vin=17V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7812A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=19V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	11.64	12.0	12.36	V	Vin=19V, Io=500mA, Tj=25℃ 14.5V ≤ Vin ≤ 27V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	11.40	-	12.60		
ΔVO (Line Regulation)		-	10	240	mV	14.5V ≤ Vin ≤ 30V, Io=500mA, Tj=25℃
		-	3	120		16V ≤ Vin ≤ 22V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	240	mV	Vin=19V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	120		Vin=19V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=19V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=19V, 5mA ≤ Io ≤ 1A
		-	-	1.0		14.5V ≤ Vin ≤ 30V, Io=500mA
Vn		-	75	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		55	-	-	dB	15V ≤ Vin ≤ 25V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	350	-	mA	Vin=19V, Tj=25℃
Ipk		-	2.2	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7815A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=23V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	14.55	15.0	15.45	V	Vin=23V, Io=500mA, Tj=25℃ 17.5V ≤ Vin ≤ 30V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	14.25	-	15.75		
ΔVO (Line Regulation)		-	12	300	mV	17.5V ≤ Vin ≤ 30V, Io=500mA, Tj=25℃
		-	3	150		20V ≤ Vin ≤ 26V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	300	mV	Vin=23V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	150		Vin=23V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.3	8.0	mA	Vin=23V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=23V, 5mA ≤ Io ≤ 1A
		-	-	1.0		17.5V ≤ Vin ≤ 30V, Io=500mA
Vn		-	90	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	18.5V ≤ Vin ≤ 28.5V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	230	-	mA	Vin=19V, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

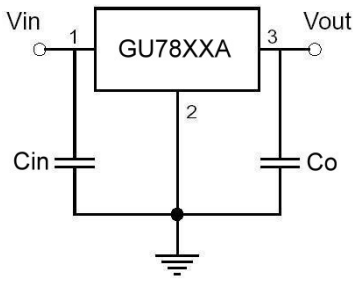
GU7818A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=27V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	17.46	18.0	18.54	V	Vin=27V, Io=500mA, Tj=25℃ 21V ≤ Vin ≤ 33V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	17.10	-	18.9		
ΔVO (Line Regulation)		-	15	360	mV	21V ≤ Vin ≤ 33V, Io=500mA, Tj=25℃
		-	5	180		24V ≤ Vin ≤ 30V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	360	mV	Vin=27V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	180		Vin=27V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.5	8.0	mA	Vin=27V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=27V, 5mA ≤ Io ≤ 1A
		-	-	1.0		21V ≤ Vin ≤ 33V, Io=500mA
Vn		-	110	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		53	-	-	dB	22V ≤ Vin ≤ 32V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	200	-	mA	Vin=27V, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7824A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=33V, Cin=0.33μF, Co=0.1μF unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	23.28	24.0	24.72	V	Vin=33V, Io=500mA, Tj=25℃ 27V ≤ Vin ≤ 38V, 5mA ≤ Io ≤ 1A, PD ≤ 15W
	B-Rank (5%)	22.80	-	25.20		
ΔVO (Line Regulation)		-	18	480	mV	27V ≤ Vin ≤ 38V, Io=500mA, Tj=25℃
		-	6	240		30V ≤ Vin ≤ 36V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	12	480	mV	Vin=33V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	4	240		Vin=33V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	4.6	8.0	mA	Vin=33V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=33V, 5mA ≤ Io ≤ 1A
		-	-	1.0		27V ≤ Vin ≤ 38V, Io=500mA
Vn		-	170	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		50	-	-	dB	28V ≤ Vin ≤ 38V, f=120Hz, Tj=25℃
VD		-	2.0	-	V	Io=1A, Tj=25℃
Isc		-	150	-	mA	Vin=33V, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.5	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

Typical Application



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