GU79XXA 3-TERMINAL NEGATIVE VOLTAGE REGULATORS

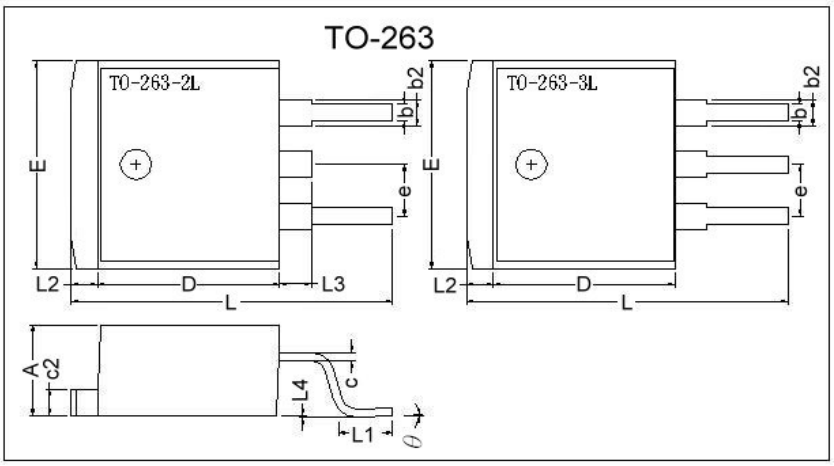
Description

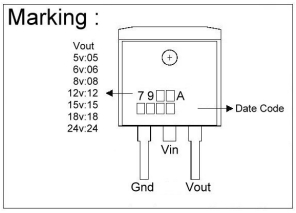
The GU79XXA series of fixed-voltage monolithic integrated-circuit voltage regulators are designed to complement Series GU78XXA in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each 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. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltage and current and also as the power pass element in precision regulators.

Features

- -5V, -6V, -8V, -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	GU7905A ~ 18A	-35V	V
	GU7924A	-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

GU7905A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-10V, Cin=2μF, Co=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)		-	12.5	50	mV	-7V ≤ Vin ≤ -25V, Io=500mA, Tj=25℃
		-	4	15		-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		-	-	6.0	mA	Vin=-10V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=-10V, 5mA ≤ Io ≤ 1A
		-	-	0.5		-7V ≤ Vin ≤ -25V, Io=500mA
Vn		-	125	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-8V ≤ Vin ≤ -18V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.4	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7906A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-11V, Cin=2μF, Co=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)		-	12.5	120	mV	-8V ≤ Vin ≤ -25V, Io=500mA, Tj=25℃
		-	4	60		-9V ≤ Vin ≤ -13V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	15	120	mV	Vin=-11V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	5	60		Vin=-11V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	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		-	150	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-9V ≤ Vin ≤ -19V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.4	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7908A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-14V, Cin=2μF, Co=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)		-	12.5	160	mV	-10.5V ≤ Vin ≤ -25V, Io=500mA, Tj=25℃
		-	4	80		-11V ≤ Vin ≤ -17V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	15	160	mV	Vin=-14V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	5	80		Vin=-14V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	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		-	200	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-11.5V ≤ Vin ≤ -21.5V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.6	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7912A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-19V, Cin=2μF, Co=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)		-	5	80	mV	-14.5V ≤ Vin ≤ -30V, Io=500mA, Tj=25℃
		-	3	30		-16V ≤ Vin ≤ -22V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	15	200	mV	Vin=-19V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	5	75		Vin=-19V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	mA	Vin=-19V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=-19V, 5mA ≤ Io ≤ 1A
		-	-	0.5		-14.5V ≤ Vin ≤ -30V, Io=500mA
Vn		-	300	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-15V ≤ Vin ≤ -25V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-0.8	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7915A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-23V, Cin=2μF, Co=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)		-	5	100	mV	-17.5V ≤ Vin ≤ -30V, Io=500mA, Tj=25℃
		-	3	50		-20V ≤ Vin ≤ -26V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	15	200	mV	Vin=-23V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	5	75		Vin=-23V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	mA	Vin=-23V, Io=500mA, Tj=25℃
Δ IQ		-	-	0.5	mA	Vin=-23V, 5mA ≤ Io ≤ 1A
		-	-	0.5		-17.5V ≤ Vin ≤ -30V, Io=500mA
Vn		-	375	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-18.5V ≤ Vin ≤ -28.5V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

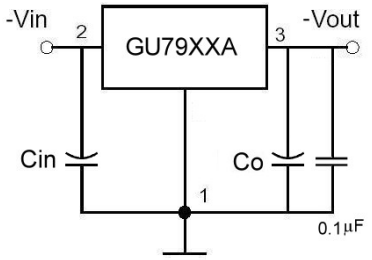
GU7918A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-27V, Cin=2μF, Co=1μF unless otherwise specified)

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)		-	5	360	mV	-21V ≤ Vin ≤ -33V, Io=500mA, Tj=25℃
		-	3	180		-24V ≤ Vin ≤ -30V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	30	360	mV	Vin=-27V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	10	180		Vin=-27V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	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		-	450	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-22V ≤ Vin ≤ -32V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

GU7924A (Refer to the test circuits, Tj=0~125℃, Io=500mA, Vin=-33V, Cin=2μF, Co=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)		-	5	480	mV	-27V ≤ Vin ≤ -38V, Io=500mA, Tj=25℃
		-	3	240		-30V ≤ Vin ≤ -36V, Io=500mA, Tj=25℃
ΔVO (Load Regulation)		-	85	480	mV	Vin=-33V, 5mA ≤ Io ≤ 1.5A, Tj=25℃
		-	25	240		Vin=-33V, 250mA ≤ Io ≤ 750mA, Tj=25℃
IQ		-	-	6.0	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		-	600	-	μV	10Hz ≤ f ≤ 100KHz, Tj=25℃
RR		54	-	-	dB	-28V ≤ Vin ≤ -38V, f=120Hz, Tj=25℃
VD		-	1.1	-	V	Io=1A, Tj=25℃
Ipk		-	2.1	-	A	Tj=25℃
ΔVo / ΔTj		-	-1.0	-	mV/℃	Io=5mA, 0℃ ≤ Tj ≤ 125℃

Typical Application



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