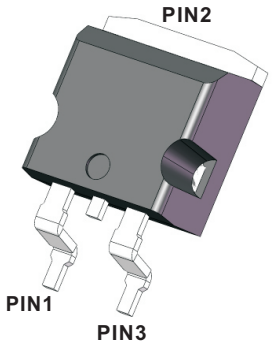
LINEAR INTEGRATED CIRCUIT 3-TERMINAL 1.5A POSITIVE VOLTAGE REGULATOR

TO-263-2L(Prefix :G)



RoHS COMPLIANT

Automotive Grade

Description

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

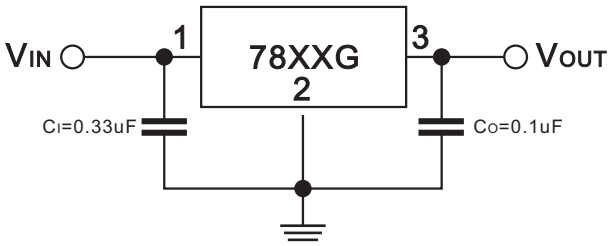
Features

- Hireliability application and automotive grade AEC-Q101 qualified
- Output current up to 1.5A
- Fixed output voltage of 5V, 6V, 8V, 9V, 12V, 15V available
- Thermal overload shutdown protection
- Output transistor SOA protection

Mechanical data

- Case: TO-263-2L
- Approx. Weight: 1.52g (0.049oz)
- Lead free finish, RoHS compliant
- Case Material: “Green” molding compound, UL flammability classification 94V-0,“Halogen-free”.

APPLICATION CIRCUIT



■ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

PARAMETER		SYMBOLS	RATINGS	UNIT
Drain-Source Voltage	VOUT=5~15V	VIN	35	V
Output Current		IOUT	1.5	A
Power Dissipation		PD	Internally Limited	W
Junction Temperature		TJ	+150	°C
Operating Temperature		TOPR	-40 ~ +125	°C
Storage Temperature		TSTG	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■THERMAL DATA

PARAMETER	SYMBOLS	RATINGS	UNIT
Junction to Ambient	RthJA	65	°C/W
Junction to Case	RthJC	5	°C/W

■**ELECTRICAL CHARACTERISTICS** (I_{OUT}=1.5A, T_J= 0°C~125°C, C_I =0.33μF, C_O=0.1μF, unless otherwise specified) (Note 1)

For 78W05G (V_{IN}=10V)

PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	4.8	5.0	5.2	V
		V_{IN} =7.5V ~ 20V, I_{OUT}=5mA ~ 1.5A,P_D≤15W	4.75		5.25	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C,I_{OUT}=5mA ~ 1.5A			50	mV
		T_J =25°C,I_{OUT}=0.25A ~ 0.75A			25	mV
Line regulation		V_{IN} =7V ~ 25V, T_J =25°C			50	mV
		V_{IN} =7.5V ~ 20V, T_J =25°C, I_{OUT}=1.5A			50	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =7.5V ~ 20V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		40		uV
Ripple Rejection	RR	V_{IN} =8V ~ 18V,f=120Hz, T_J =25°C	59	80		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

For 78W06G (V_{IN}=11V)

PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	5.76	6.0	6.24	V
		V_{IN} =8.5V ~ 21V, I_{OUT}=5mA ~ 1.5A,P_D≤15W	5.70		6.30	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C,I_{OUT}=5mA ~ 1.5A			60	mV
		T_J =25°C,I_{OUT}=0.25A ~ 0.75A			30	mV
Line regulation		V_{IN} =8V ~ 25V, T_J =25°C			60	mV
		V_{IN} =8.5V ~ 21V, T_J =25°C, I_{OUT}=1.5A			60	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =8.5V ~ 21V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		45		uV
Ripple Rejection	RR	V_{IN} =9V ~ 19V,f=120Hz, T_J =25°C	56	75		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

For 78W08G (V_{IN}=14V)

PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	7.68	8.0	8.32	V
		V_{IN} =10.5V ~ 23V, I_{OUT}=5mA ~ 1.5A, P_D≤15W	7.60		8.40	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A			80	mV
		T_J =25°C, I_{OUT}=0.25A ~ 0.75A			40	mV
Line regulation		V_{IN} =10.5V ~ 25V, T_J =25°C			80	mV
		V_{IN} =10.5V ~ 23V, T_J =25°C, I_{OUT}=1.5A			80	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =10.5V ~ 23V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		58		uV
Ripple Rejection	RR	V_{IN} =11.5V ~ 21.5V, f=120Hz, T_J =25°C	53	72		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

For 78W09G (V_{IN}=15V)

PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	8.64	9.0	9.36	V
		V_{IN} =11.5V ~ 24V, I_{OUT}=5mA ~ 1.5A, P_D≤15W	8.55		9.45	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A			90	mV
		T_J =25°C, I_{OUT}=0.25A ~ 0.75A			45	mV
Line regulation		V_{IN} =11.5V ~ 25V, T_J =25°C			90	mV
		V_{IN} =11.5V ~ 24V, T_J =25°C, I_{OUT}=1.5A			90	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =11.5V ~ 24V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		58		uV
Ripple Rejection	RR	V_{IN} =12.5V ~ 22.5V, f=120Hz, T_J =25°C	53	72		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

For 78W12G (V_{IN}=19V)

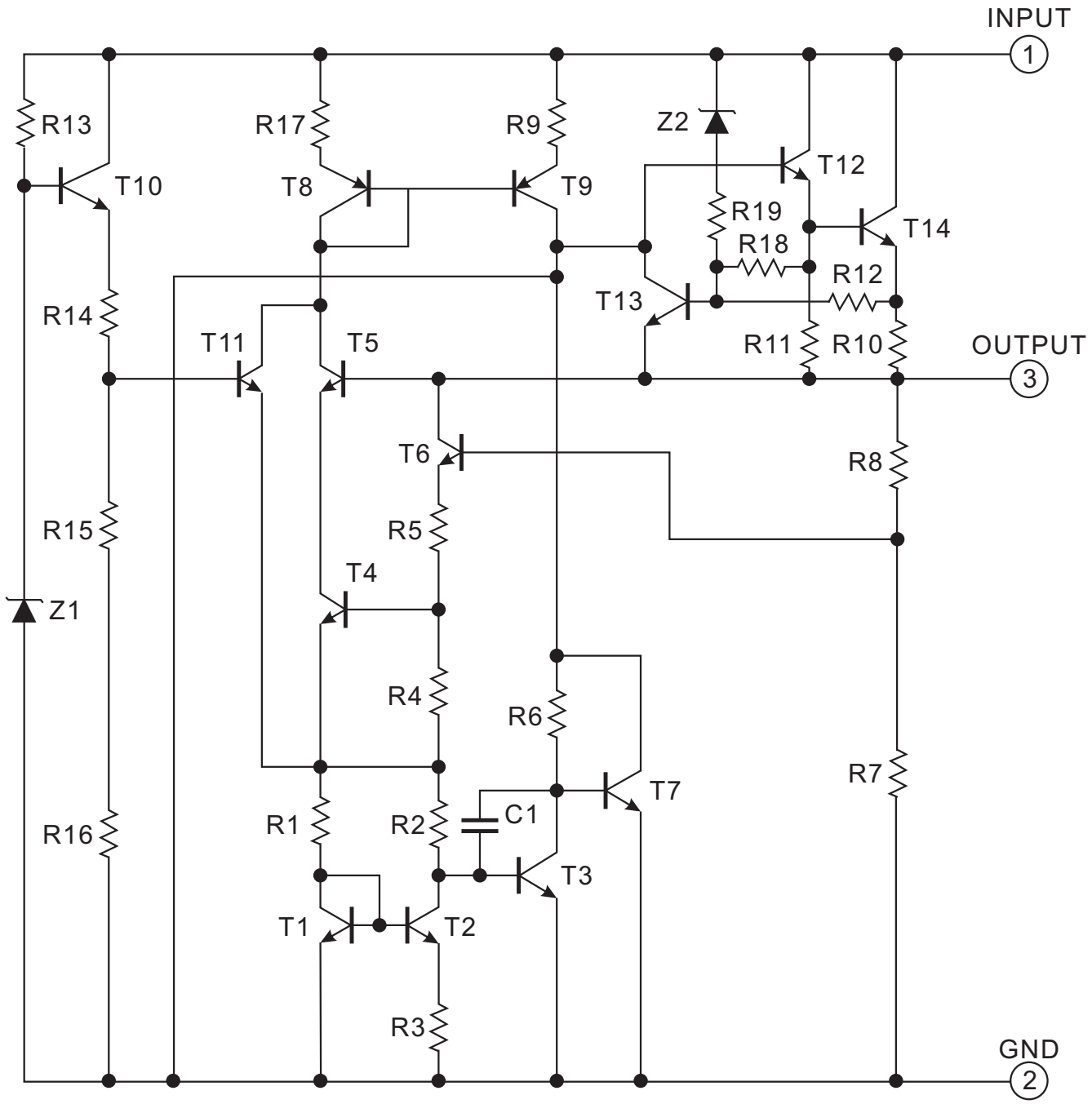
PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	11.52	12	12.48	V
		V_{IN} =14.5V ~ 27V, I_{OUT}=5mA ~ 1.5A,P_D≤15W	11.4		12.6	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C,I_{OUT}=5mA ~ 1.5A			120	mV
		T_J =25°C,I_{OUT}=0.25A ~ 0.75A			60	mV
Line regulation		V_{IN} =14.5V ~ 30V, T_J =25°C			120	mV
		V_{IN} =14.5V ~ 27V, T_J =25°C, I_{OUT}=1.5A			120	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =14.6V ~ 30V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		75		uV
Ripple Rejection	RR	V_{IN} =15V ~ 25V,f=120Hz, T_J =25°C	52	72		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

For 78W15G (V_{IN}=23V)

PARAMETER	SYMBOLS	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J =25°C, I_{OUT}=5mA ~ 1.5A	14.4	15.0	15.6	V
		V_{IN} =17.5V ~ 30V, I_{OUT}=5mA ~ 1.5A,P_D≤15W	14.25		15.75	V
Dropout Voltage	V_D	T_J =25°C		2.0		V
Load Regulation	△V_{OUT}	T_J =25°C,I_{OUT}=5mA ~ 1.5A			150	mV
		T_J =25°C,I_{OUT}=0.25A ~ 0.75A			75	mV
Line regulation		V_{IN} =18.5V ~ 30V, T_J =25°C			150	mV
		V_{IN} =17.7V ~ 30V, T_J =25°C, I_{OUT}=1.5A			150	mV
Quiescent Current	I_Q	T_J =25°C, I_{OUT}≤1.5A			8.0	mA
Quiescent Current Change	△I_Q	V_{IN} =17.5V ~ 30V			1.0	mA
		I_{OUT}=5mA ~ 1.5A			0.5	mA
Output Noise Voltage	eN	10Hz ≤ f ≤ 100kHz		90		uV
Ripple Rejection	RR	V_{IN} =18.5V ~ 28.5V,f=120Hz, T_J =25°C	51	70		dB
Peak Output Current	I_{PEAK}	T_J =25°C		1.8		A

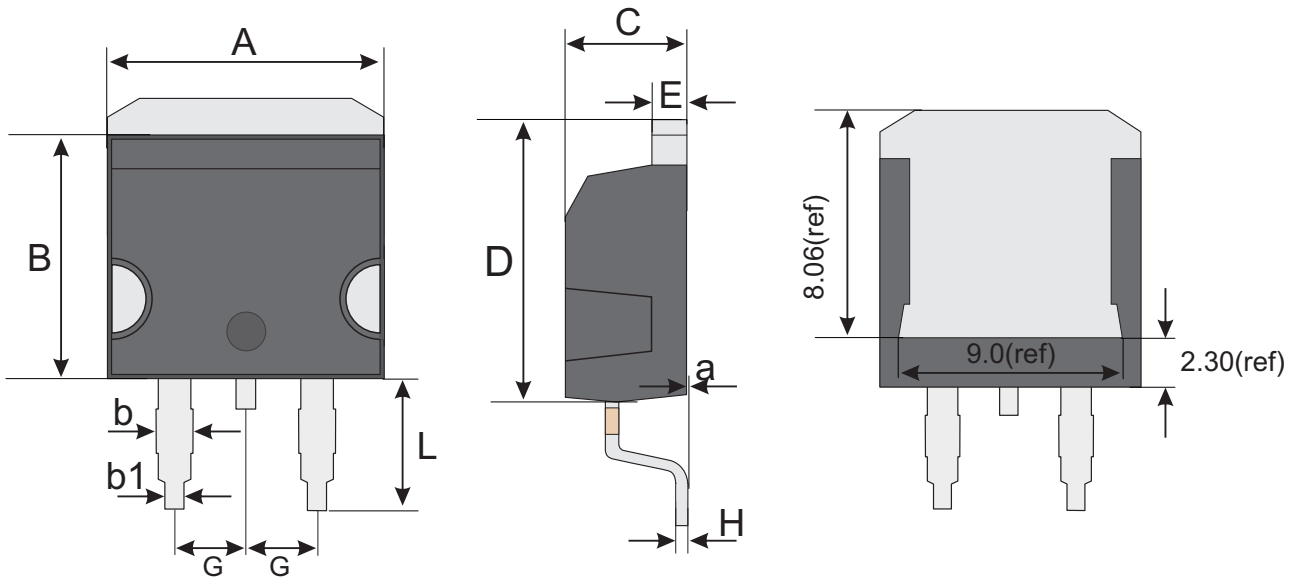
Notes:
1.The Maximum steady state usable output current are dependent on input voltage, heat sinking, lead length of the package and copper pattern of PCB. The data above represents pulse test conditions with junction temperatures specified at the initiation of test.
2. Power dissipation<0.5W

■ Test Circuits



Package Outline
Plastic surface mounted package; 2 leads

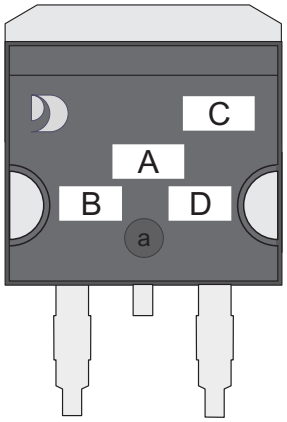
TO-263-2L



TO-263-2L mechanical data

UNIT		A	B	b	b1	C	D	E	G	H	L	a
mm	max	10.28	9.35	1.67	0.9	4.65	10.56	1.37	2.64	0.6	5.35	0.1 ref.
	typ	10.18	9.15	1.47	0.8	4.45	10.36	1.27	2.54	0.5	5.15	
	min	10.08	8.95	1.27	0.7	4.25	10.16	1.17	2.44	0.4	4.95	
mil	max	405	368	66	35	183	416	54	104	24	211	4.0 ref.
	typ	401	360	58	31	175	409	50	100	20	203	
	min	397	352	50	28	167	400	46	96	16	195	

Marking Diagram



Unmarkable Surfacea
Marking Composition Field
a:Ejector Pin Mark
A: Marking Area
B: Lot Code
C: Additional Information
D: Date Code (YWW)
Y: Years(0~9)
WW: Week

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