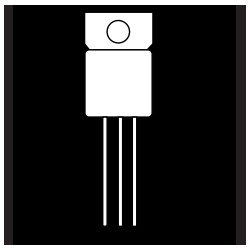
(COTS) COMMERCIAL OFF-THE-SHELF POSITIVE FIXED VOLTAGE REGULATORS IN TO-257 PACK-



Three Terminal, Fixed Voltage, 1.5 Amp Precision Positive Regulators In Hermetic JEDEC TO-257AA Package

FEATURES

- Isolated Hermetic Package, JEDEC TO-257AA Outline
- Output Voltages: 5V, 12V, 15V
- Output Voltages Set Internally ±2%
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Standard Off-The-Shelf

DESCRIPTION

These three terminal positive regulators are supplied in a hermetically sealed metal package whose outline is similar to the industry standard TO-220 plastic package. All protective features are designed into the circuit including thermal shutdown, current limiting and safe-area control. With heat sinking, they can deliver over 1.5 amps of output current. These units feature internally trimmed output voltages to +/- 2% of nominal voltage. Standard voltages are 5V, 12V, and 15V. However, other voltages are available up to 24 volts. These units are ideally suited for Military applications where a hermetically sealed package is required.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Input Voltage ..... 35 V
Operating Junction Temperature Range ..... - 55°C to + 150°C
Storage Temperature Range ..... - 65°C to + 150°C
Typical Power/Thermal Characteristics:
Rated Power @ 25° C T_C 17.5W
T_A ..... 3 W
Thermal Resistance
q_{JC} ..... 4.2°C/W
q_{JA} ..... 42°C/W

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ELECTRICAL CHARACTERISTICS 5 Volt V_{IN} = 10V, I_O = 500mA, -55°C T_A 125°C (unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		4.9	5.1	V
		V_{IN} = 7.5V to 20V	•	4.8	5.2	V
Line Regulation	V_{RLINE}	V_{IN} = 7.5V to 20V			5	m V
(Note 1)			•		12	m V
		V_{IN} = 8.0V to 12V			4	m V
			•		10	m V
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			12	m V
(Note 1)			•		25	m V
		I_O = 250mA to 750 mA			6	m V
			•		15	m V
Standby Current Drain	I_{SCD}				6	m A
			•		6.5	m A
Standby Current Drain	DI_{SCD}	V_{IN} = 7.5V to 20V	•		0.8	m A
Change With Line	(Line)					
Standby Current Drain	DI_{SCD}	I_O = 5mA to 1000mA	•		0.5	m A
Change With Load	(Load)					
Dropout Voltage	V_{DO}	T_A = 25°C, DV_{OUT} = 100mV, I_O = 1.0A			2.5	V
Peak Output Current	$I_{O(pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{OS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	$\frac{DV_{IN}}{DV_{OUT}}$	f =120 Hz, DV_{IN} = 10V		66		dB
		(Note 3)	•	60		dB
Output Noise Voltage	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V
(Note 3)						R M S
Long Term Stability	$\frac{DV_{OUT}}{Dt}$	T_A = 25°C, t = 1000 hrs.			75	m V
(Note 3)						

ELECTRICAL CHARACTERISTICS 12 Volt V_{IN} = 19V, I_O = 500mA, -55°C T_A 125°C (unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		11.76	12.24	V
		V_{IN} = 14.5V to 27V	•	11.6	12.4	V
Line Regulation	V_{RLINE}	V_{IN} = 14.5V to 27V			18	m V
(Note 1)			•		50	m V
		V_{IN} = 16V to 22V			9	m V
			•		30	m V
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			32	m V
(Note 1)			•		60	m V
		I_O = 250mA to 750 mA			20	m V
			•		40	m V
Standby Current Drain	I_{SCD}				6.0	m A
			•		6.5	m A
Standby Current Drain	DI_{SCD}	V_{IN} = 15V to 30V	•		0.8	m A
Change With Line	(Line)					
Standby Current Drain	DI_{SCD}	I_O = 5mA to 1000mA	•		0.5	m A
Change With Load	(Load)					
Dropout Voltage	V_{DO}	DV_{OUT} = 100mV, I_O = 1.0A	•		2.5	V
Peak Output Current	$I_{O(pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{OS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	$\frac{DV_{IN}}{DV_{OUT}}$	f =120 Hz, DV_{IN} = 10V		61		dB
		(Note 3)	•	54		dB
Output Noise Voltage	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V
(Note 3)						R M S
Long Term Stability	$\frac{DV_{OUT}}{Dt}$	T_A = 25°C, t = 1000 hrs.			120	m V
(Note 3)						

Notes:
1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to V_{IN} = 35V.
3. If not tested, shall be guaranteed to the specified limits.
   The • denotes the specifications which apply over the full operating temperature range.

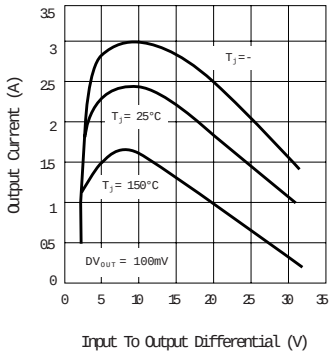
ELECTRICAL CHARACTERISTICS 15 Volt V_{IN} = 23V, I_O = 500mA, -55°C T_A 125°C (unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		14.7	15.3	V
		V_{IN} = 18.5V to 30V	•	14.5	15.5	V
Line Regulation	V_{RLINE}	V_{IN} = 17.5V to 30V			20	m V
(Note 1)			•		50	m V
		V_{IN} = 20V to 26V			15	m V
			•		25	m V
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			35	m V
(Note 1)		I_O = 5mA to 1.0 Amp	•		75	m V
		I_O = 250mA to 750 mA			21	m V
			•		45	m V
Standby Current Drain	I_{SCD}				6.0	m A
			•		6.5	m A
Standby Current Drain	DI_{SCD}	V_{IN} = 18.5V to 30V	•		0.8	m A
Change With Line	(Line)					
Standby Current Drain	DI_{SCD}	I_O = 5mA to 1000mA	•		0.5	m A
Change With Load	(Load)					
Dropout Voltage	V_{DO}	T_A = 25°C, DV_{OUT} = 100mV, I_O = 1.0A			2.5	V
Peak Output Current	$I_{O(pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{OS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	DV_{IN}	f =120 Hz, DV_{IN} = 10V		54		dB
	DV_{OUT}	(Note 3)	•	52		dB
Output Noise Voltage	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V
(Note 3)						R M S
Long Term Stability	DV_{OUT}	T_A = 25°C, t = 1000 hrs.			150	m V
(Note 3)	Dt					

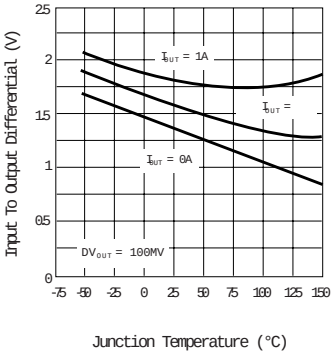
Notes:
1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to V_{IN} = 35V.
3. If not tested, shall be guaranteed to the specified limits.
   The • denotes the specifications which apply over the full operating temperature range.

TYPICAL PERFORMANCE CHARACTERISTICS

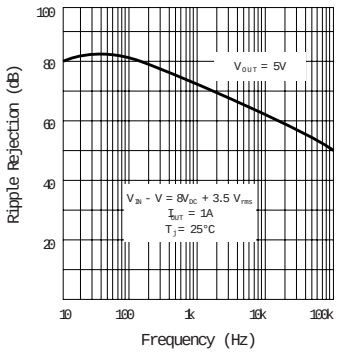
PEAK OUTPUT CURRENT



DROPOUT VOLTAGE



RIPPLE REJECTION



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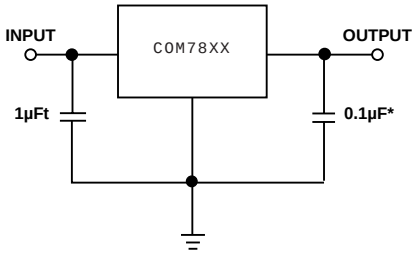
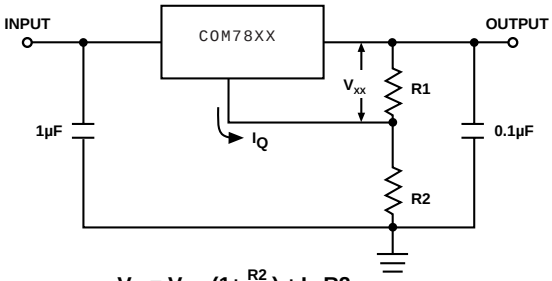
TYPICAL APPLICATIONS

Fixed Output Regulator



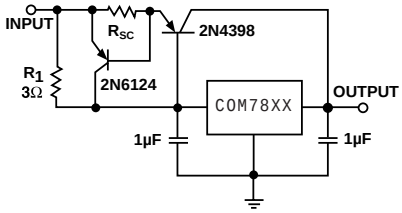
*Increasing value of output capacitor improves system transient response.
Required only if regulator is located an appreciable distance from power supply filter.

Circuit For Increasing Output Voltage

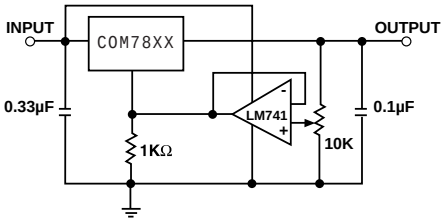


$$V_O = V_{XX}\ (1+\frac{R2}{R1}) + I_Q\ R2$$

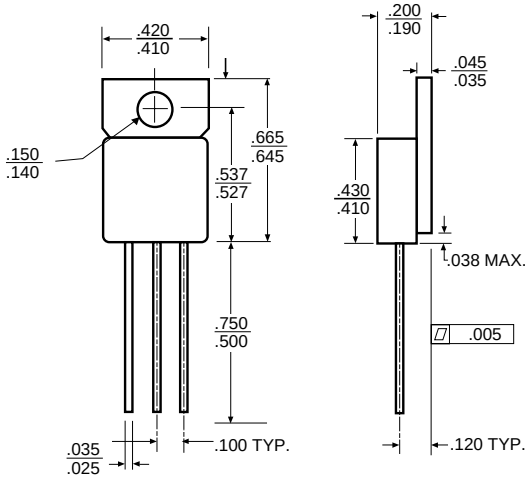
High Output Current,
Short Circuit Protected



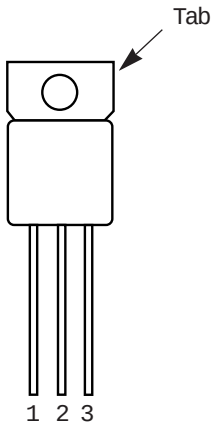
Adjustable Output Regulator,
7 To 30 Volts



MECHANICAL OUTLINE
TO-257AA



PIN CONNECTION



COM78XXT
Isolated
Front View
Pin 1: Input
Pin 2: Ground
Pin 3: Output
Tab: Isolated

Note:

- Case is metal/hermetically sealed glass feedthroughs
- Isolated Tab

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