Pb Free Plating Product

LM78H05K/LM78H12K/LM78H15K

THINKISEMI 1.0 AMPERE POSITIVE THREE TERMINAL REGULATOR

Features
※ Output current to 1.0A
※ Thermal overload protection
※ Short circuit protection
※ Output transition SOA protection

Application
※ Switching Regulators and Amplifiers
※ AC and DC Motor Controls
※ Inverters,Solenoid and Relay Drivers

Mechanical Data
※ Case:TO-3 metal package
※ Operating Temperature Range -65 to + 300 °C
※ Terminals: Solderable per MIL-STD-202 method 208
※ Polarity: As per configuration
※ Mounting position: Any
※ Weight: 6.0 gram approximately

TO-3/TO– 204AE outline

Electrical Characteristics LM78HxxK

$0^{\circ}C \le T_J \le 125^{\circ}C$ unless otherwise noted.

			LM78H05K			LM78H12K			LM78H15K			
OutputVoltage			5V			12V			15V			Units
Input Voltage (unless otherwise noted)			10V			19V			23V			
Symbol	Parameter	Conditions	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
	Short-Circuit Current	Tj = 25˚C		2.1			1.5			1.2		A
	Peak Output Current	Tj = 25˚C		2.4			2.4			2.4		A
	Average TC of V_{OUT}	0˚C ≤ Tj ≤ +125˚C, I_O = 5 mA		0.6			1.5			1.8		mV/˚C
V_{IN}	Input Voltage Required to Maintain Line Regulation	Tj = 25˚C, $I_O \le 1A$		7.5		14.6			17.7			V

Absolute Maximum Ratings

Input Voltage (V_O = 5V, 12V and 15V)	35V
Internal Power Dissipation (Note 1)	Internally Limited
Operating Temperature Range (T_A)	0˚C to +70˚C
Maximum Junction Temperature	
(TO-3 Package)	150˚C
(TO-220 Package)	150˚C
Storage Temperature Range	−65˚C to +150˚C
Lead Temperature (Soldering, 10 sec.)	
TO-3 Package	300˚C
TO-220 Package	230˚C

Electrical Characteristics LM78HxxK

$0^{\circ}C \le T_J \le 125^{\circ}C$ unless otherwise noted.

				LM78H05K			LM78H12K			LM78H15K			
OutputVoltage				**5V**			**12V**			**15V**			**Units**
Input Voltage (unless otherwise noted)				**10V**			**19V**			**23V**			
Symbol	**Parameter**	**Conditions**		**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	
V_O	Output Voltage	T_j = 25˚C, 5 mA ≤ I_O ≤ 1A		4.8	5	5.2	11.5	12	12.5	14.4	15	15.6	V
		P_D ≤ 15W, 5 mA ≤ I_O ≤ 1A		4.75		5.25	11.4		12.6	14.25		15.75	V
		$V_{MIN} \le V_{IN} \le V_{MAX}$		(7.5 ≤ V_{IN} ≤ 20)			(14.5 ≤ V_{IN} ≤ 27)			(17.5 ≤ V_{IN} ≤ 30)			V
ΔV_O	Line Regulation	I_O = 500 mA	T_j = 25˚C		3	50		4	120		4	150	mV
			ΔV_{IN}	(7 ≤ V_{IN} ≤ 25)			14.5 ≤ V_{IN} ≤ 30)			(17.5 ≤ V_{IN} ≤ 30)			V
			0˚C ≤ T_j ≤ +125˚C			50			120			150	mV
			ΔV_{IN}	(8 ≤ V_{IN} ≤ 20)			(15 ≤ V_{IN} ≤ 27)			(18.5 ≤ V_{IN} ≤ 30)			V
		I_O ≤ 1A	T_j = 25˚C			50			120			150	mV
			ΔV_{IN}	(7.5 ≤ V_{IN} ≤ 20)			(14.6 ≤ V_{IN} ≤ 27)			(17.7 ≤ V_{IN} ≤ 30)			V
			0˚C ≤ T_j ≤ +125˚C			25			60			75	mV
			ΔV_{IN}	(8 ≤ V_{IN} ≤ 12)			(16 ≤ V_{IN} ≤ 22)			(20 ≤ V_{IN} ≤ 26)			V
ΔV_O	Load Regulation	T_j = 25˚C	5 mA ≤ I_O ≤ 1.5A		10	50		12	120		12	150	mV
			250 mA ≤ I_O ≤ 750 mA			25			60			75	mV
		5 mA ≤ I_O ≤ 1A, 0˚C ≤ T_j ≤ +125˚C				50			120			150	mV
I_Q	Quiescent Current	I_O ≤ 1A	T_j = 25˚C			8			8			8	mA
			0˚C ≤ T_j ≤ +125˚C			8.5			8.5			8.5	mA
ΔI_Q	Quiescent Current Change	5 mA ≤ I_O ≤ 1A				0.5			0.5			0.5	mA
		T_j = 25˚C, I_O ≤ 1A				1.0			1.0			1.0	mA
		$V_{MIN} \le V_{IN} \le V_{MAX}$		(7.5 ≤ V_{IN} ≤ 20)			(14.8 ≤ V_{IN}≤ 27)			(17.9 ≤ V_{IN} ≤ 30)			V
		I_O ≤ 500 mA, 0˚C ≤ T_j ≤ +125˚C				1.0			1.0			1.0	mA
		$V_{MIN} \le V_{IN} \le V_{MAX}$		(7 ≤ V_{IN} ≤ 25)			(14.5 ≤ V_{IN}≤ 30)			(17.5 ≤ V_{IN} ≤ 30)			V
V_N	Output Noise Voltage	T_A =25˚C, 10 Hz ≤ f ≤ 100 kHz			40			75			90		µV
$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	Ripple Rejection		I_O ≤ 1A, T_j = 25˚C or	62	80		55	72		54	70		dB
		f = 120 Hz	I_O ≤ 500 mA 0˚C ≤ T_j ≤ +125˚C	62			55			54			dB
		$V_{MIN} \le V_{IN} \le V_{MAX}$		(8 ≤ V_{IN} ≤ 18)			(15 ≤ V_{IN} ≤ 25)			(18.5 ≤ V_{IN} ≤ 28.5)			V
R_O	Dropout Voltage	T_j = 25˚C, I_{OUT} = 1A			2.0			2.0			2.0		V
	Output Resistance	f = 1 kHz			8			18			19		mΩ

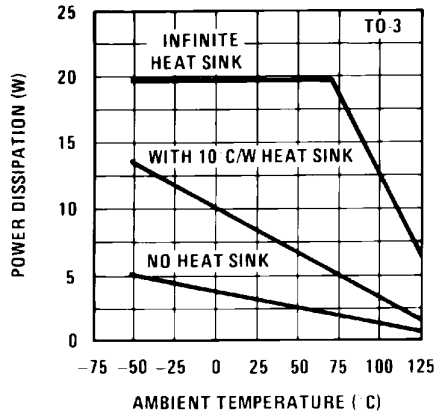
Note 1: Thermal resistance of the TO-3 package (K, KC) is typically 4˚C/W junction to case and 35˚C/W case to ambient. Thermal resistance of the TO-220 package (T) is typically 4˚C/W junction to case and 50˚C/W case to ambient.

Note 2: All characteristics are measured with capacitor across the input of 0.22 µF, and a capacitor across the output of 0.1µF. All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques (t_w ≤ 10 ms, duty cycle ≤ 5%). Output voltage changes due to changes in internal temperature must be taken into account separately.

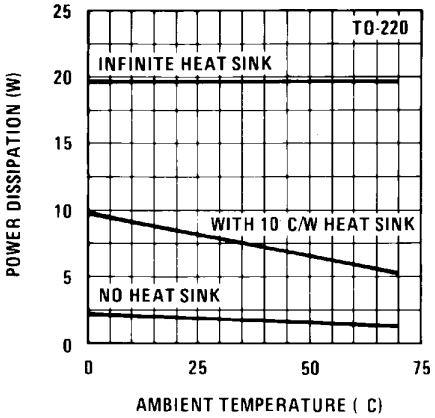
Note 3: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. For guaranteed specifications and the test conditions, see Electrical Characteristics.

Typical Performance Characteristics

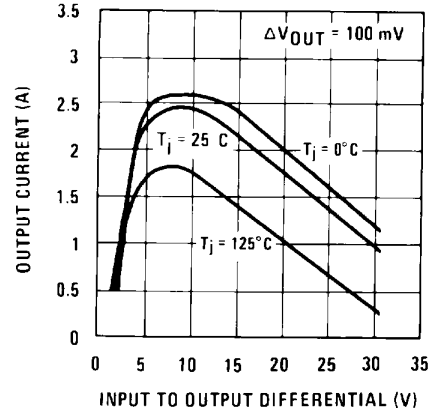
Maximum Average Power Dissipation



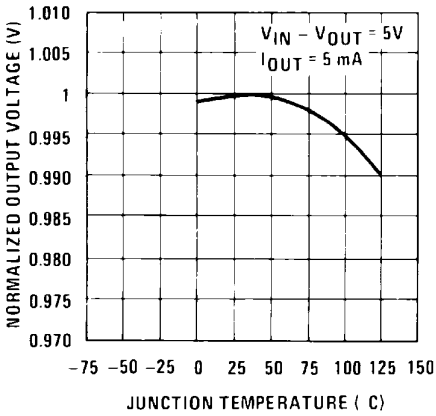
Maximum Average Power Dissipation



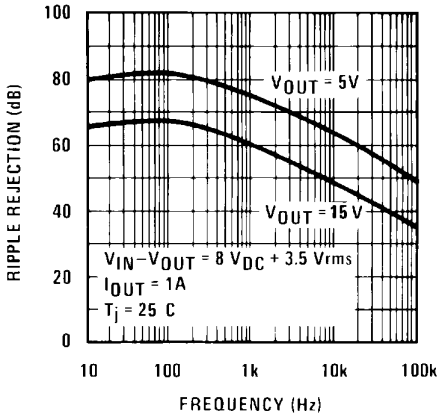
Peak Output Current



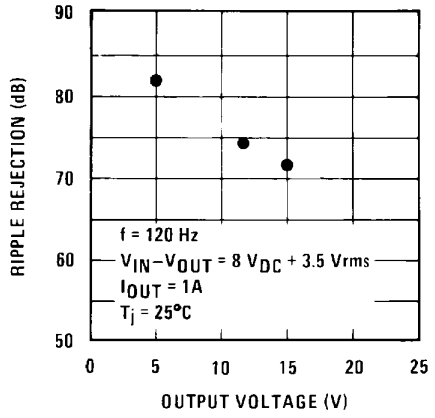
Output Voltage (Normalized to 1V at T_J = 25°C)



Ripple Rejection

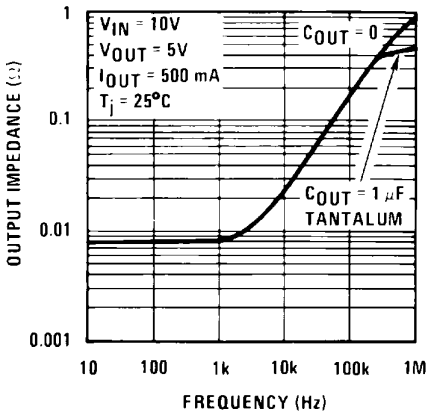


Ripple Rejection

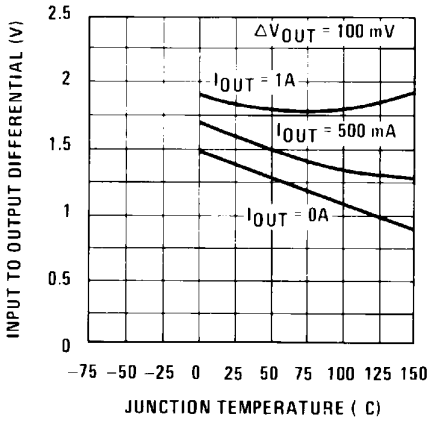


Typical Performance Characteristics (Continued)

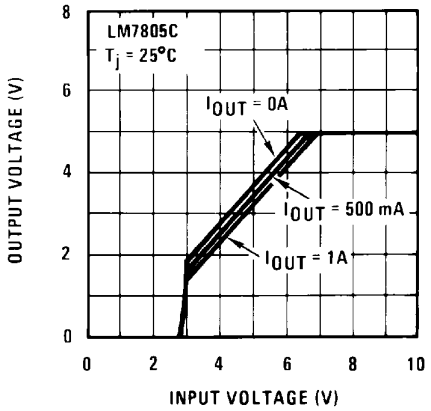
Output Impedance



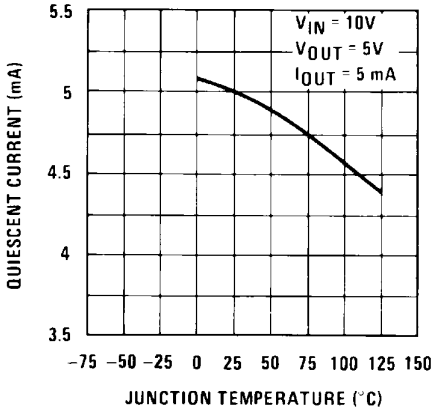
Dropout Voltage



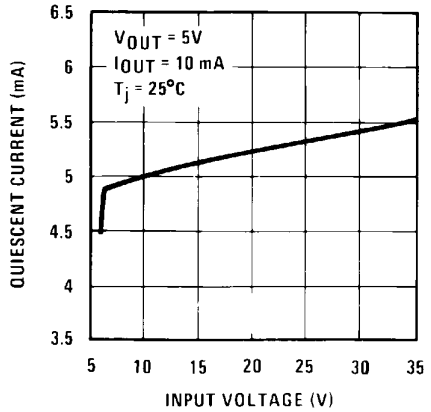
Dropout Characteristics



Quiescent Current



Quiescent Current



THINKI TO-3 Package Dimensions

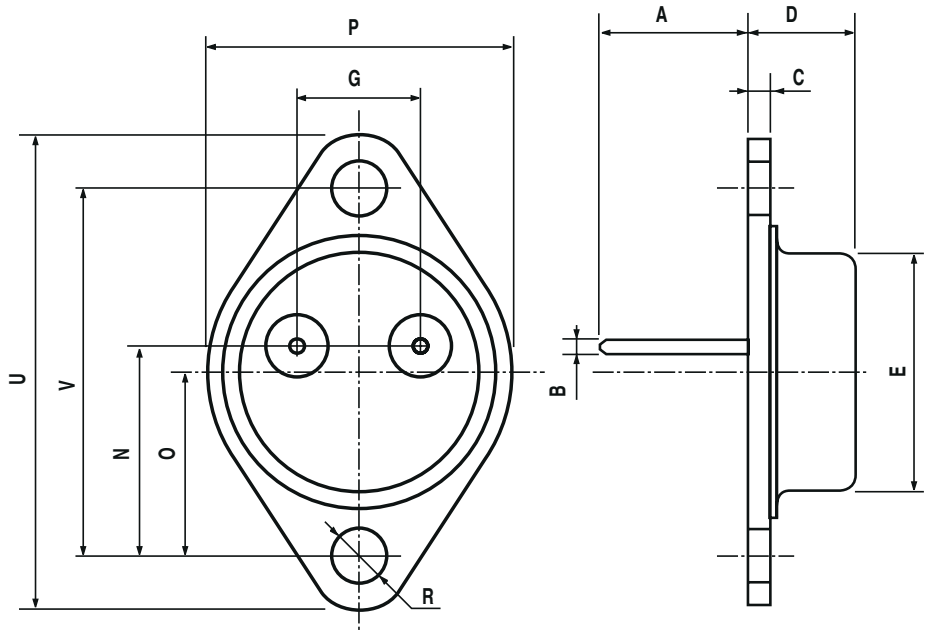


Table 26. TO-3 mechanical data

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		11.85			0.466	
B	0.96	1.05	1.10	0.037	0.041	0.043
C			1.70			0.066
D			8.7			0.342
E			20.0			0.787
G		10.9			0.429	
N		16.9			0.665	
P			26.2			1.031
R	3.88		4.09	0.152		0.161
U			39.5			1.555
V		30.10			1.185	