

# Positive-Voltage Regulators



Rev.5 Aug. 2013

	<b>78MXXnd5</b>
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- **3-Terminal Regulators**
- **Output current up to 800mA**
- **Internal Thermal Overload Protection**
- **Internal Short-Circuit Limiting**
- **Output transistor safe operating area protection**

## Description

The 78MXXnd5 series of three terminal regulators are available in the TO-220 package with several fixed output voltages making it useful in a wide range of applications.

Nom. output voltage	Regulator
5V	78M05nd5
6V	78M06nd5
8V	78M08nd5
8.5V	78M85nd5
9V	78M09nd5
10V	78M10nd5
12V	78M12nd5
15V	78M15nd5
18V	78M18nd5
20V	78M20nd5
24V	78M24nd5
27V	78M27nd5

**KC PACKAGE  
(TOP VIEW)**



## Absolute maximum ratings over operating temperature range (unless otherwise noted)

	78M05nd5 thru 78M18nd5	78M24nd5 thru 78M27nd5	UNIT
Input voltage	35	40	V
Operating free-air, case, or virtual junction temperature range	0 to 150	0 to 150	°C
Storage temperature range	-65 to 150	-65 to 150	
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds	260	260	

## Recommended operating condition

PARAMETR		MIN	MAX	UNIT
Input voltage, $V_I$	78M05nd5	7	25	V
	78M06nd5	8	25	
	78M08nd5	10.5	25	
	78M85nd5	10.5	25	
	78M09nd5	11.5	27	
	78M10nd5	12.5	28	
	78M12nd5	14.5	30	
	78M15nd5	17.5	30	
	78M18nd5	21	33	
	78M20nd5	23	36	
Output current, $I_O$	78M24nd5	27	38	A
	78M27nd5	30	40	
Operating virtual junction temperature, $T_J$		0	125	°C

## Positive-Voltage Regulators

### 78MXXnd5

**78M05nd5 electrical characteristics at specified virtual junction temperature,  $V_I=10V$ ,  $I_O=350mA$   
(unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		78M05nd5			UNIT
			MIN	TYP	MAX	
Output voltage**	25°C		4.8	5	5.2	V
	$I_O=5mA$ to 350mA $V_I=7V$ to 20V	0 to 125 °C	4.75	5	5.25	
Input regulation	$I_O=200mA$	$V_I=7V$ to 25V			100	mV
		$V_I=8V$ to 25V			50	
Ripple rejection	$V_I=8V$ to 18V, $f=120Hz$		62	80		dB
Output regulation	25°C				100	mV
	$I_O=5mA$ to 500mA				50	
Output noise voltage	$f=10Hz-100Hz$				40	µV
	25°C					
Dropout voltage	25°C				2	V
	$I_O=500mA$				2.2	
Bias current	25°C				4.8	mA
	125°C				7.5	
Bias current change	0 to 125 °C				1.0	
	$V_I=7V$ to 25V				0.5	
Temperature coefficient of output voltage	$I_O=5mA$				1	mV/C
	0 to 125 °C					

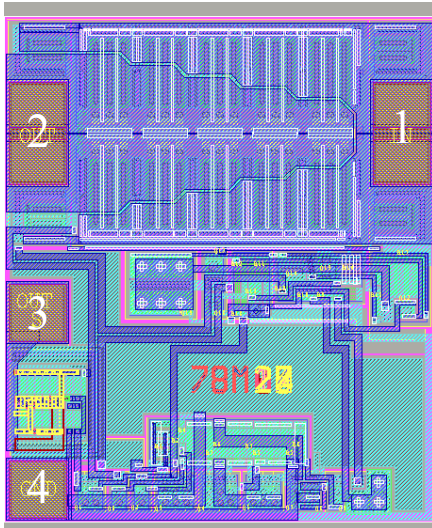
\* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1 µF capacitor across the output.

\*\* This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Positive-Voltage Regulators

### 78MXXnd5

### Pad Location



### Pad location coordinates

Chip size: 1.0 x 1.16 mm  
 Wafer size: 100 mm  
 Wafer Thickness: 460±30um (or 280±30um)  
 Top metal: AlSiTi  
 Backside metal: - (or Ti-Ni (V)-Ag)

PAD Number	PAD Name	PAD Coordinates (um)		PAD Size, (um)	
		X	Y	W	H
1	INPUT	880	865	120	215
2	OUTPUT	120	865	120	215
3		120	485	120	120
4	GND	120	120	120	120