

XH78L05H

Descriptions

The XH78L05H series are three terminal positive regulators designed for a wide variety of applications including local, on-card regulation.

This series of regulators are complete with internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking are provided, these regulators can deliver output currents up to 150mA.

The XH78L05H series are available in SOT-89 packages.

Features

- Output Current up to 150mA
- Fixed Output Voltages of 5V
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components
- Output Transistor Safe-area Protection
- Lead-Free Packages: SOT-89
 - Totally Lead-Free; ROHS Compliant

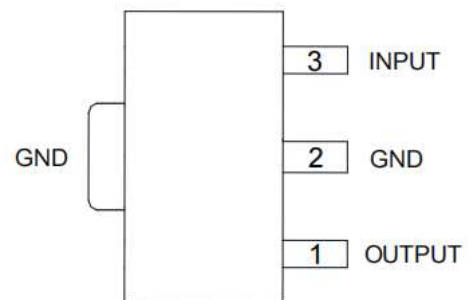
Applications

- Consumer Electronics
- Microprocessor Power Supply
- Mother Board

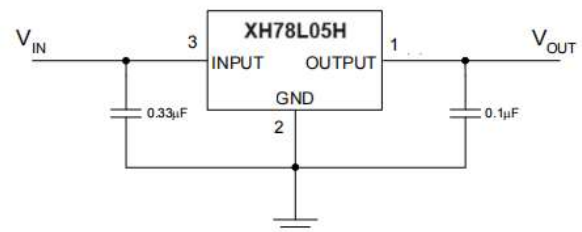
Pin Assignments

Top View

SOT-89



Typical Applications Circuit



Absolute Maximum Ratings

Symbol	Parameter	Rating		Unit
V_{IN}	Input Voltage	36		V
T_J	Operating Junction Temperature	+150		°C
T_{LEAD}	Lead Temperature (Soldering, 10sec)	+260		°C
TSTG	Storage Temperature Range	-65 to +150		°C
θ_{JA}	Thermal Resistance	SOT-89	165	°C/W
P_D	Power Dissipation	0.75		W
ESD	ESD (Human Body Model)	5000		V
ESD	ESD (Charged Device Model)	2000		V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	–	30	V
T_J	Operating Junction Temperature Range	-40	+150	°C

Electrical Characteristics

XH78L05HA

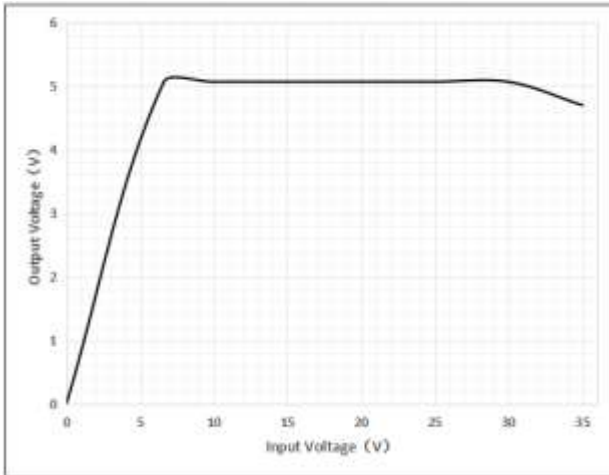
(@ $V_{IN} = 10V$, $I_{OUT} = 40mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = +25^{\circ}C$, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	—	5.0	5.05	5.1	V
V_{RLINE}	Line Regulation	$7V \leq V_{IN} \leq 20V$	—	8	150	mV
V_{RLOAD}	Load Regulation	$1mA \leq I_{OUT} \leq 150mA$	—	10	60	mV
I_Q	Quiescent Current	—	—	3	5.5	mA
ΔI_Q	Quiescent Current Change	$8V \leq V_{IN} \leq 20V$	—	—	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	—	—	0.1	
PSRR	Ripple Rejection	$F = 120Hz$, $8V \leq V_{IN} \leq 18V$	47	62	—	dB
V_{DROP}	Dropout Voltage	$I_{OUT} = 40mA$	—	1.7	—	V
		$I_{OUT} = 150mA$	—	1.8	—	
N_O	Output Noise Voltage	$10Hz \leq f \leq 100kHz$ (Note 4)	—	40	—	μV
$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature	$I_{OUT} = 5mA$	—	0.42	—	$mV/^{\circ}C$
$(\Delta V_{OUT}/V_{OUT})/\Delta T$	Coefficient		—	84	—	$ppm/^{\circ}C$
θ_{JC}	Thermal Resistance	SOT-89	—	28.3	—	$^{\circ}C/W$

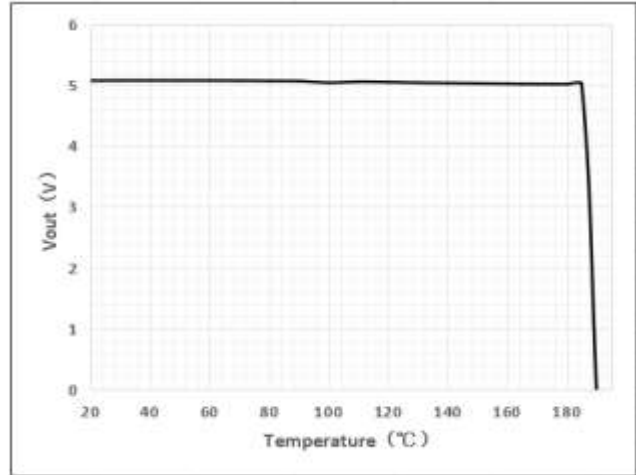
Note: 0.01 μF minimum load capacitance is recommended to limit high frequency noise.

Performance Characteristics

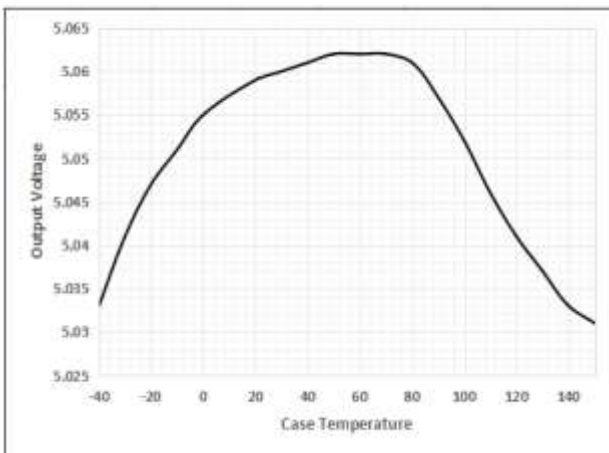
Output Voltage vs. Input Voltage
($I_{out}=40\text{ mA}$ Temp.=25 °C)



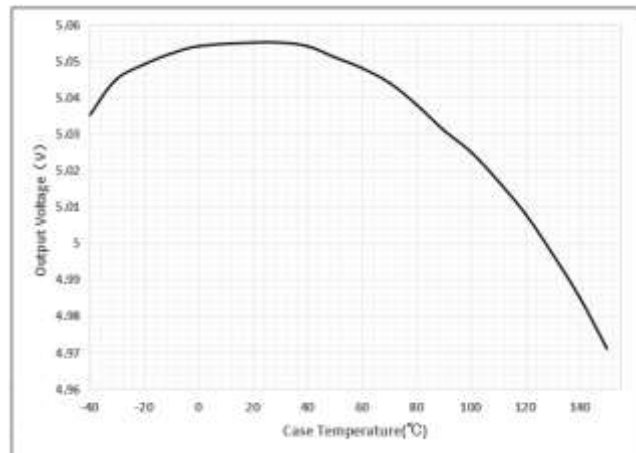
Over Temperature Protection
($V_{in}=10\text{ V}$, $I_{out}=40\text{ mA}$)



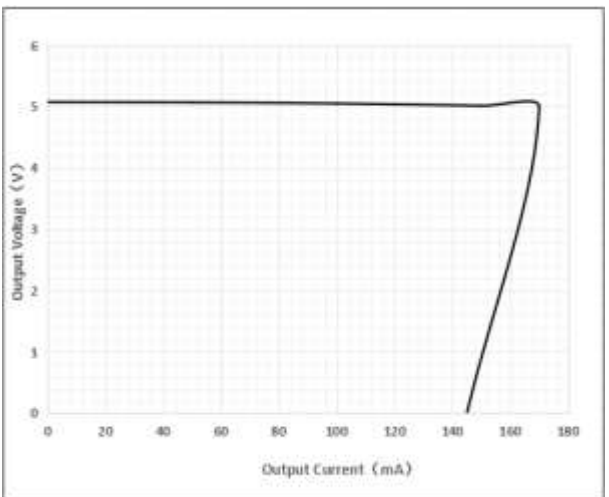
Output Voltage vs. Case Temperature
($V_{in}=10\text{ V}$, $I_{out}=40\text{ mA}$)



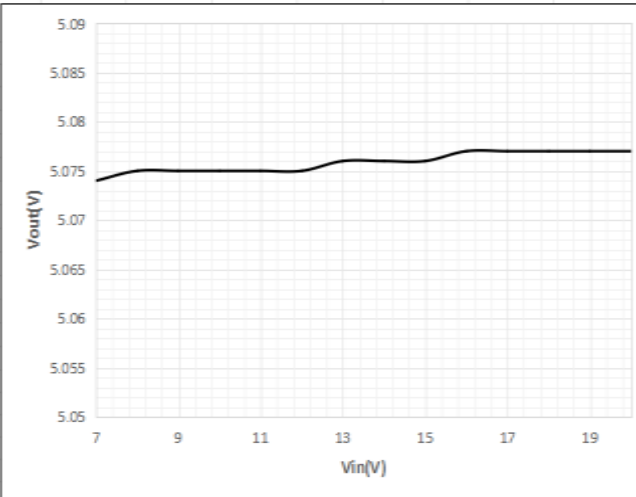
Output Voltage vs. Case Temperature
($V_{in}=10\text{ V}$, $I_{out}=150\text{ mA}$)



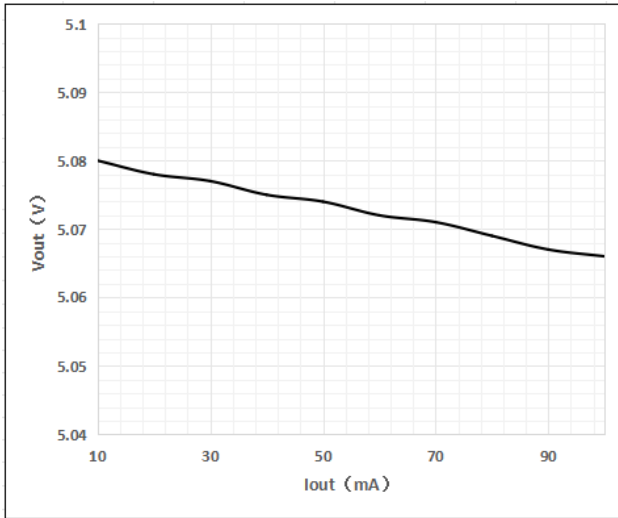
Output Voltage vs. Output Current
($V_{in}=10\text{ V}$ Temp.=25 °C)



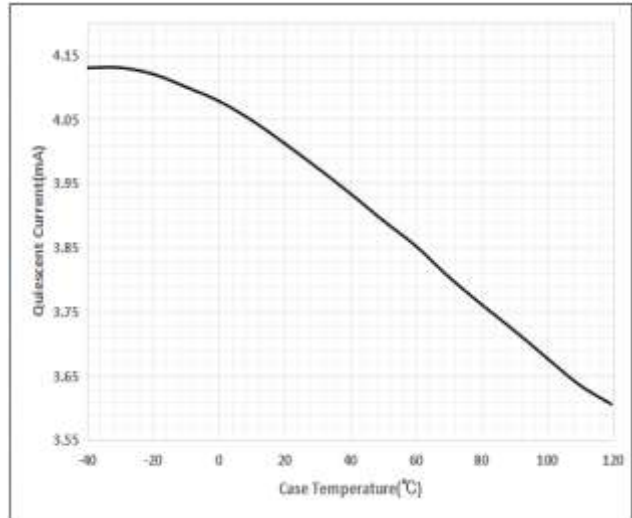
Line regulation
($I_{out}=40\text{ mA}$ $7\text{ V} \leq V_{in} \leq 20\text{ V}$)



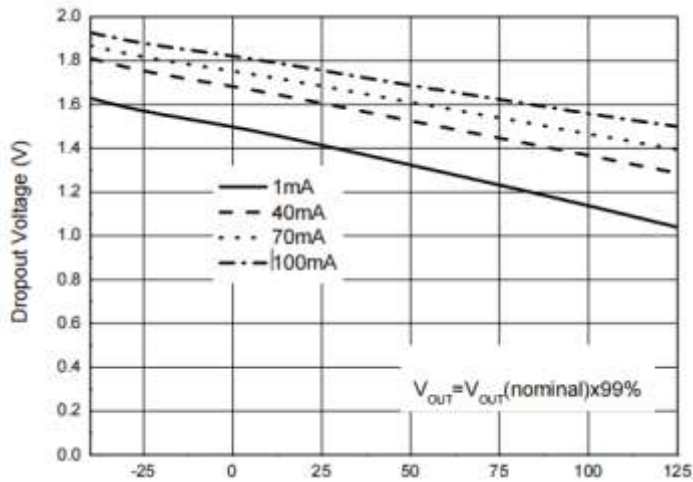
Load regulation
($V_{in}=10V$ $10mA \leq I_{out} \leq 100mA$)



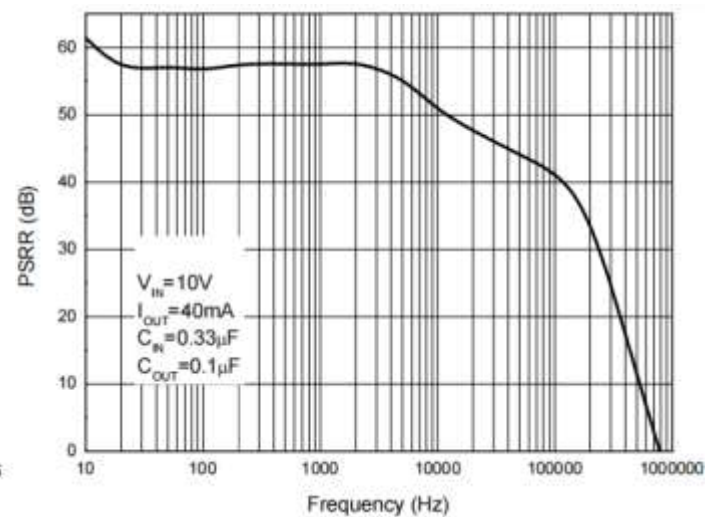
Quiescent Current vs. Case Temperature
($V_{in}=10V$, $I_{out}=40mA$)



Dropout Voltage vs. Case Temperature

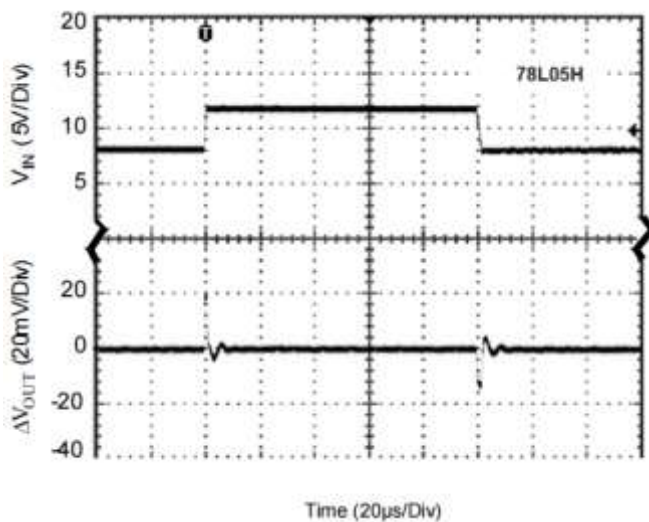


PSRR vs. Frequency



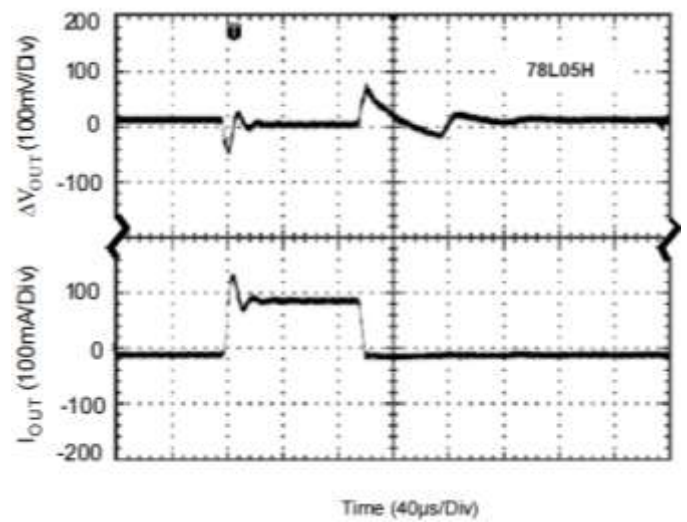
Line Transient

(Conditions: $I_{out}=40mA$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$)



Load Transient

(Conditions: $V_{in}=10V$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$)



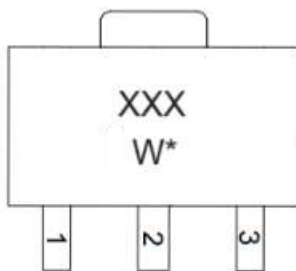
Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing
SOT-89	-40 to 150°C	XH78L05HARTR-G1	RrA	1000/Tape & Reel

Marking Information

(1) SOT-89

(Top View)



(See Ordering Information)

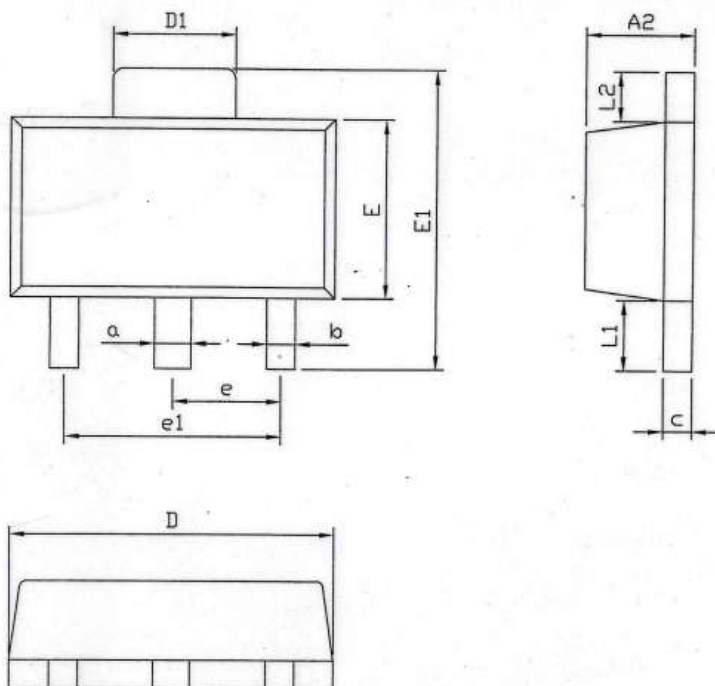
Frist Line: Mark ID

Second line: Date Code

W: Work Week of Molding

*: Internal Code

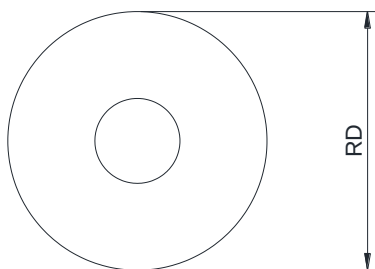
(1) Package Type: SOT-89



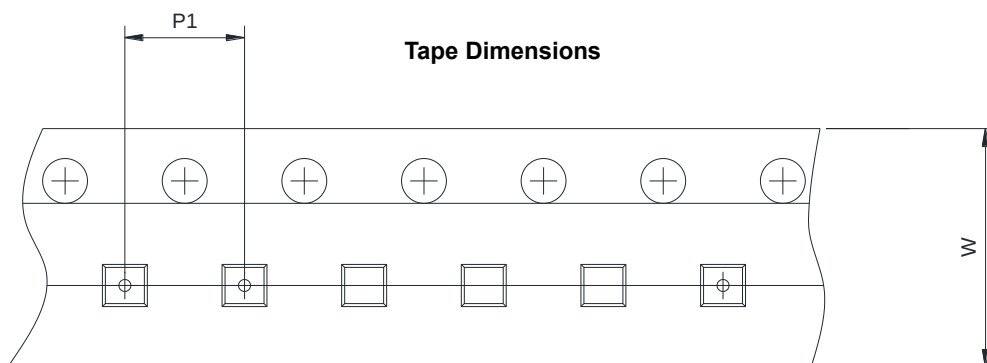
Symbol	Dimensions In Millimeters	
	Min	Max
A2	1.40	1.60
* a	0.45	0.55
b	0.38	0.47
c	0.36	0.46
* D	4.40	4.60
D1	1.60	1.80
E	2.40	2.60
* E1	4.00	4.30
e	1.00	2.00
* e1	2.95	3.05
* L1	0.80	1.00
* L2	0.65	0.75

Tape and Reel Information

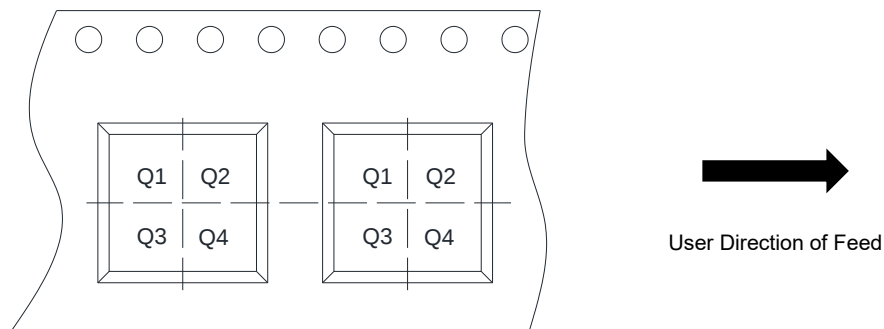
Reel Dimensions



Tape Dimensions



Quadrant Assignments for Pin1 Orientation in Tape



Project		SOT-89
RD	Reel Dimension	7inch
W	Overall Width of the Carrier Tape	12mm
P1	Pitch between Successive Cavity Centers	8mm
Pin1	Pin1 Quadrant	Q3