

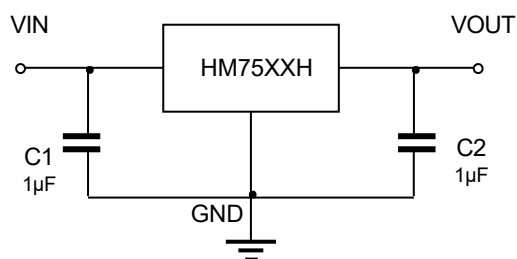
24V 150mA 1.5uA Low Dropout Linear Regulator

■ Description

The HM75XXH is a high ripple rejection, low power consumption, low dropout CMOS voltage regulator with short circuit protection. Its quiescent current at no-load is as low as 1.5uA, and it can provide an output current of 150mA under the condition that the input and output voltage difference is extremely small, and it can still maintain a good regulation rate. It is very suitable for portable battery-powered products, watch Meters and security products, etc.

The HM75XXH retains all common features of low dropout regulators, including low dropout PMOS pass devices, short circuit protection and thermal shutdown.

■ Typical Application Circuit



■ Features

- $\pm 2\%$ output voltage tolerance over temperature
- VIN range up to 24V
- Ultra-low quiescent current 1.5uA
- When the output current is 100mA, the input and output voltage difference is 650mV
- Built-in Thermal Protection
- Built-in Overcurrent Protection
- Compatible with low ESR ceramic capacitors

■ Application

- Portable battery powered devices (sensor lights, sterilization boxes, etc.)
- Security (fire alarms, smoke detectors, etc.)
- Smart meters (electricity, gas, etc.)
- Communication equipment (mobile phone, PDA, etc.)
- Home appliances (light strips, desk lamps, etc.)
- Sensors

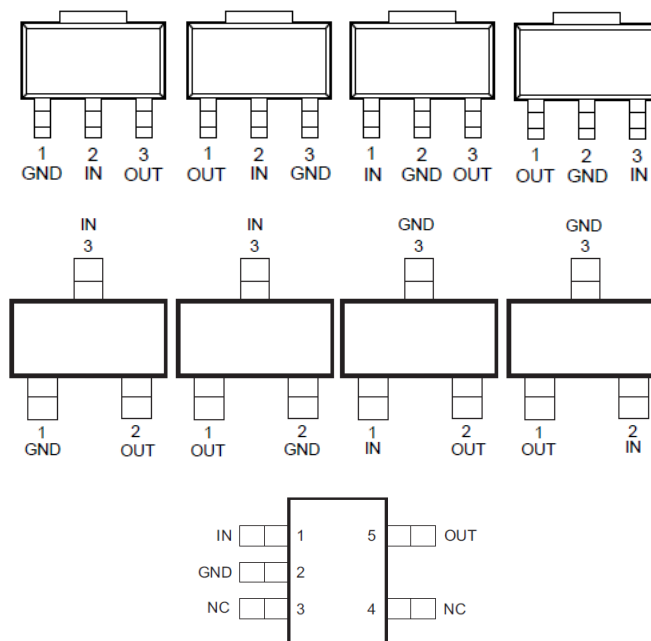
■ Package (RoHS Compliant)

- SOT23-3
- SOT23-5
- SOT89-3

■ Ordering Information

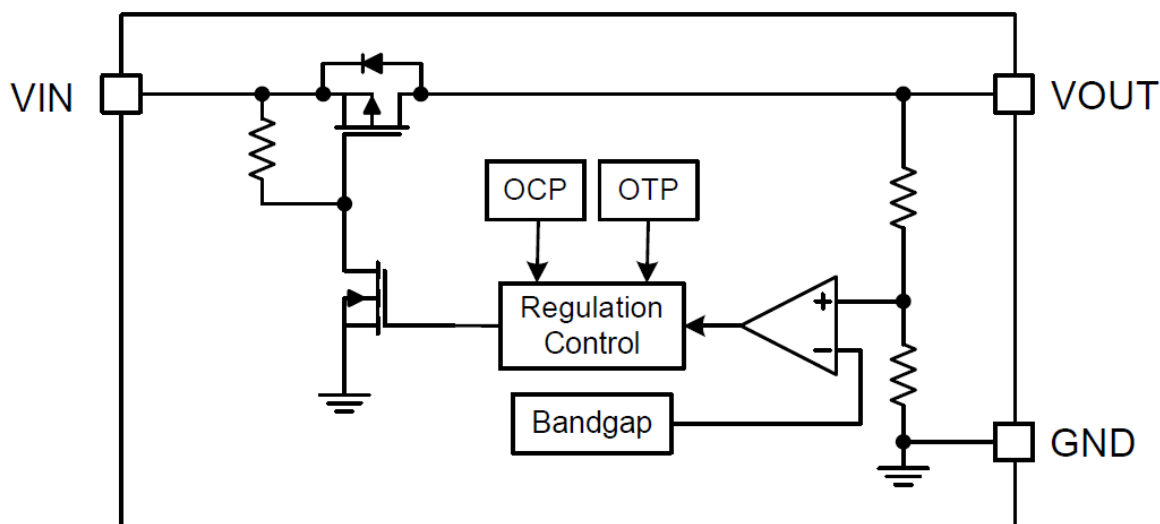
Part Number	Input voltage (V)	Output voltage (V)	Maximum output current (mA)	Quiescent Current (uA)	Output precision	PSRR (dB@ 100Hz)	Dropout (mV)	Enable
HM75XXH	5~24	1.8~5.0 (1.8/3.0/3.3/5.0)	150	1.5	$\pm 2\%$	70	650@100mA	—

■ Pin configuration



Pin Name	Pin No. SOT893	Pin No. SOT893	Pin No. SOT893	Pin No. SOT893	Pin No. SOT233	Pin No. SOT233	Pin No. SOT233	Pin No. SOT233	Pin No. SOT235	Pin Function
VOUT	3	1	1	3	1	2	1	2	5	Output Voltage Pin
GND	1	3	2	2	2	1	3	3	2	Ground
VIN	2	2	3	1	3	3	2	1	1	Input Voltage pin.
NC	-	-	-	-	-	-	-	-	3,4	Non-Connection

■ Functional block diagram



■ Absolute Maximum Ratings

Project	Symbol	Value	Units
Input voltage	V_{IN}	-0.3 ~ +25	V
Lead Temperature (Soldering, 10 sec.)	—	300	°C
Storage Temperature	T_{stg}	-65 ~ +150	°C
Junction Temperature	T_J	125	°C

■ Recommended Operating Conditions

Project	Symbol	Value	Units
Input voltage	V_{IN}	5 ~ 24	V
Junction Temperature	T_J	-40 ~ +125	°C

■ Electrical Characteristics

$V_{IN} = V_{OUT} + 2V$, or $V_{IN} = 5V$ (whichever is greater), $I_{OUT} = 1mA$, $C_{IN} = C_{OUT} = 1\mu F$, $T_J = 25^\circ C$, unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{OUT}	Output Voltage Accuracy		-2%		2%	V
ΔV_{LINE}	Line Regulation	$V_{IN} = V_{OUT} + 2V \sim 24V$ $V_{IN} = 5V \sim 24V$, if $V_{OUT} < 3V$		2	50	mV
ΔV_{LOAD}	Load Regulation	$I_{OUT} = 1mA \sim 150mA$		40	75	mV
V_{DROP}	Dropout Voltage	$I_{OUT} = 100mA$		650		mV
		$I_{OUT} = 150mA$		1100		mV
I_Q	Quiescent Current	$I_{OUT} = 0mA$		1.5	4	μA
I_{CL}	Current Limit		170	200		mA
PSRR	Power-supply rejection ratio	$V_{IN} = 12V$, $I_{OUT} = 10mA$, $f = 100Hz$		70		dB
T_{SD}	Thermal Shutdown			150		°C
T_{SDHY}	Thermal Shutdown Hy			25		°C

Typical Characteristics

$V_{IN}=5V$, $I_{OUT}=1mA$, $V_{OUT}=3.3V$, $C_{IN}=C_{OUT}=1\mu F$, $T_J=25^{\circ}C$, unless otherwise specified

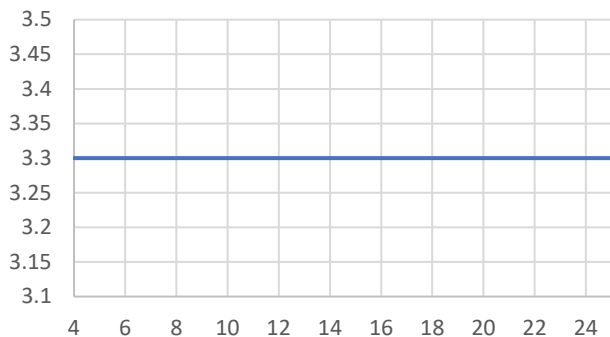


Fig 1. V_{OUT} vs V_{IN}

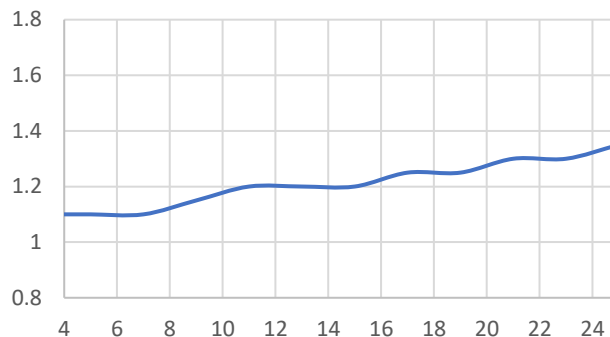


Fig 2. I_Q vs V_{IN}

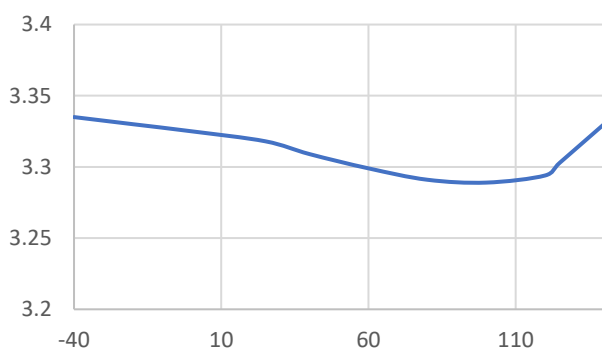


Fig 3. V_{OUT} (3.3V) vs Temperature

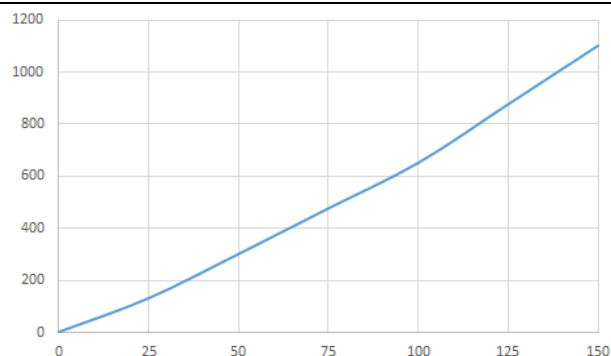


Fig 4. Dropout vs Load

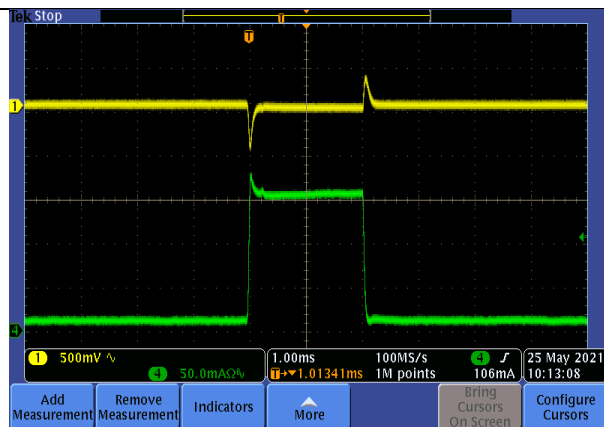


Fig 5. V_{OUT} Load Transient (1mA~150mA)

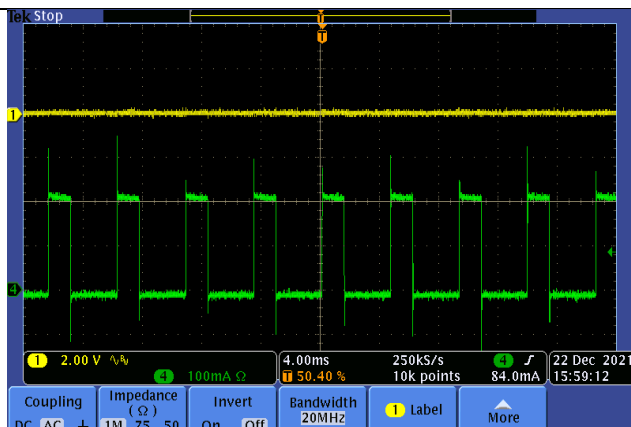


Fig 6. V_{OUT} Short to GND

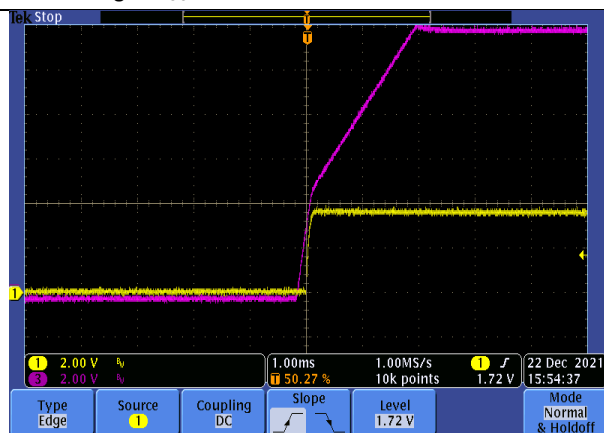


Fig 7. V_{IN} Start up

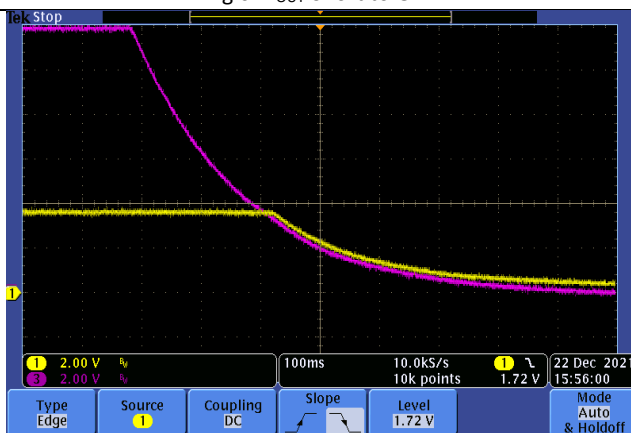


Fig 8. V_{IN} Shut down