Description

TN73H Series are a set of three-terminal, low power, high voltage regulators implemented in CMOS technology. The series features extremely low quiescent current which is typically 2.0μA. They allow input voltages as high as 20V. The device provides large current with a significantly small dropout voltage.

TN73H Series consists of a high-precision voltage reference, an error correction circuit, an over temperature protection circuit, and a current limited output driver. They are available with several fixed output voltages ranging from 1.8V to 5.5V. CMOS technology ensures low dropout voltage and low current consumption.

TN73H Series are available in standard SOT-23、SOT-23-3 and SOT-89 packages. Standard products are Pb-free and Halogen-free.

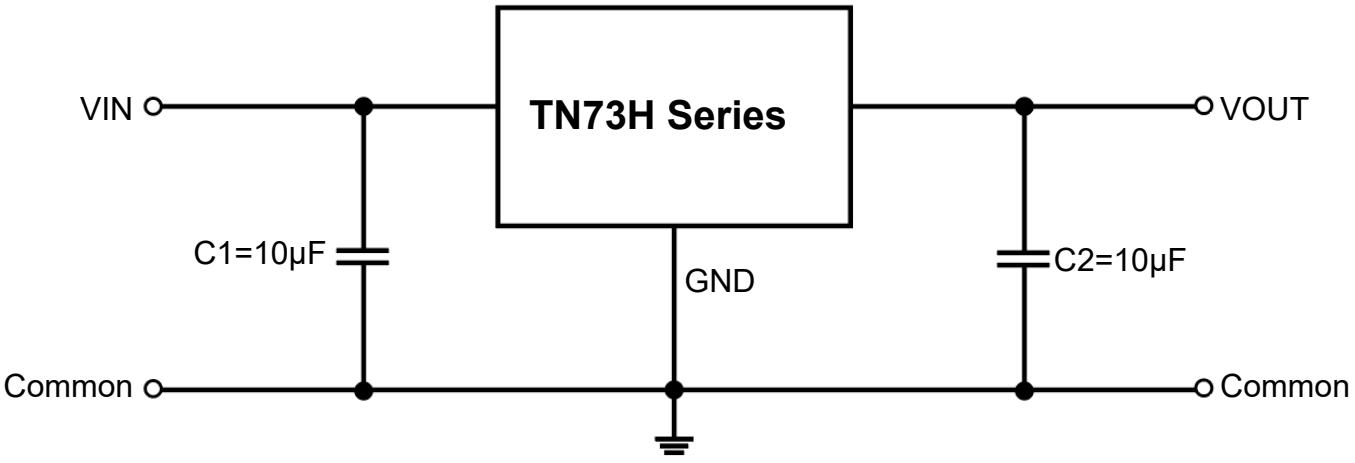
Features

- Maximum Output Current: 500mA
- Input Voltage Range: 3V~20V
- Quiescent current: 2uA(Typ.)
- Dropout Voltage: 140mV@100mA (V_{OUT}=3.3V)
- Output Voltage Range:1.8V~5.5V
- PSRR: 70dB @10KHz
- Fast Load Transient Response
- Good Line Regulation: 0.01%/V
- Good Load Regulation: 5mV@1mA≤I_{OUT}≤50mA
- Soft Start

Applications

- Battery Powered Equipment
- Voltage Regulator for Microprocessor
- Voltage Regulator for LAN Cards
- Wireless Communication Equipment
- Audio/Video Equipment

Typical Application Circuit



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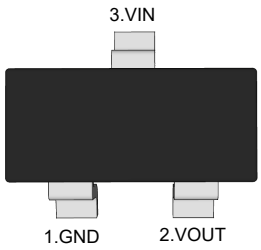
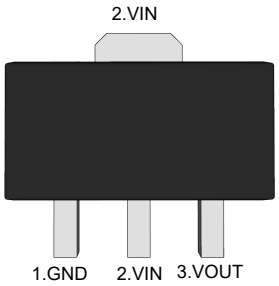
Pin Distribution

SOT-23



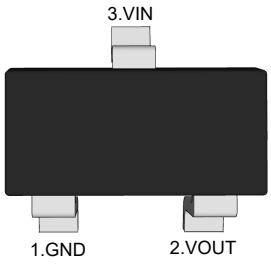
(Top View)

SOT-89



(Top View)

SOT-23-3



(Top View)

Functional Pin Description

Pin Name	Pin Function
VIN	Power Input Voltage
GND	Ground
VOUT	Output Voltage

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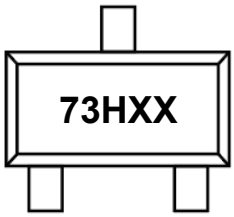
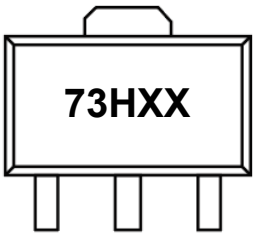
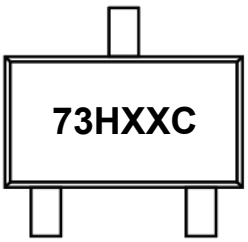
Ordering Information

TN73H-□□□□

Package Type
SA:SOT-23
SC:SOT-23-3
SQ:SOT-89

Output Voltage
28 : 2.8V 30 : 3.0V 33 : 3.3V
36 : 3.6V 40 : 4.0V 50 : 5.0V

Output current tap
M : 500mA

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan Note	MSL Level	Marking Code
TN73HM28SA	SOT-23	7	3000	RoHS & Green	MSL1	 XX:Output Voltage e.g. 30:3.0V
TN73HM30SA						
TN73HM33SA						
TN73HM36SA						
TN73HM40SA						
TN73HM50SA						
TN73HM28SQ	SOT-89	7/13	1000/3000	RoHS & Green	MSL1	 XX:Output Voltage e.g. 30:3.0V
TN73HM30SQ						
TN73HM33SQ						
TN73HM36SQ						
TN73HM40SQ						
TN73HM50SQ						
TN73HM28SC	SOT-23-3	7	3000	RoHS & Green	MSL3	 XX:Output Voltage e.g. 30:3.0V
TN73HM30SC						
TN73HM33SC						
TN73HM36SC						
TN73HM40SC						
TN73HM50SC						

Note:

RoHS: TN defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials.

Green: TN defines "Green" to mean Halogen-Free and Antimony-Free.

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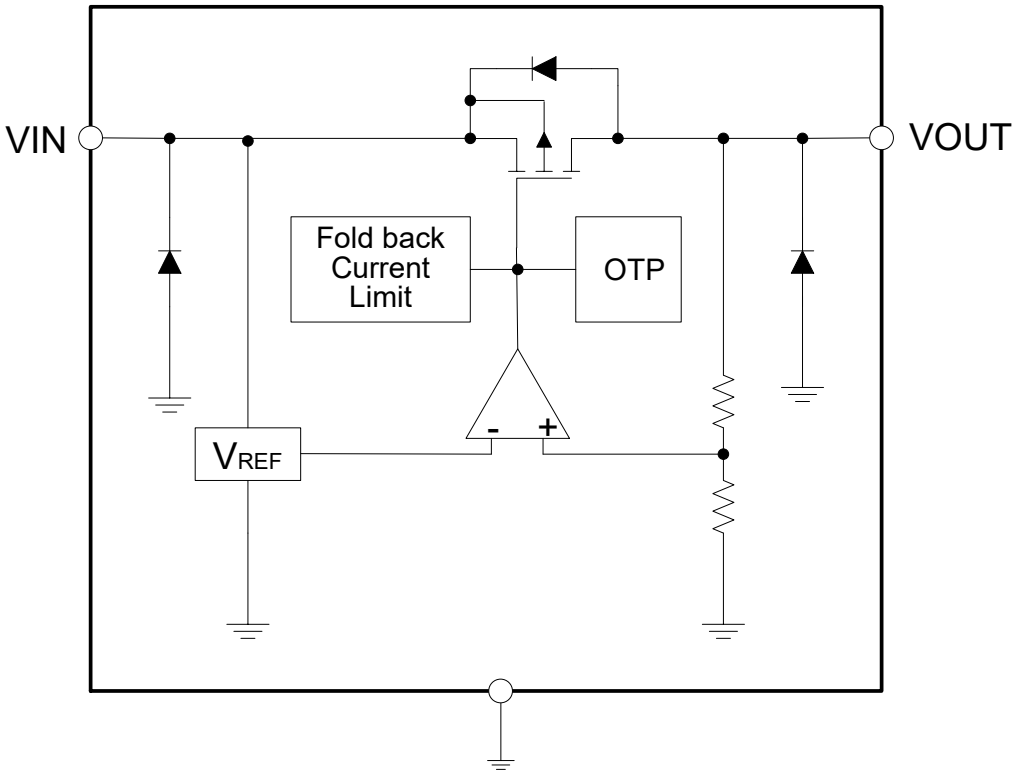
Function Block Diagram



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Absolute Maximum Ratings Note1

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter		Value	Unit
Input Voltage		-0.3~25	V
Output Voltage		-0.3~6	V
Power Dissipation	SOT-23	0.4	W
	SOT-23-3	0.45	W
	SOT-89	0.66	W
Thermal Resistance,Junction-to-Ambient	SOT-23	250	°C/W
	SOT-23-3	220	°C/W
	SOT-89	150	°C/W
Junction Temperature		-40~ +125	°C
Storage Temperature Range		-55~ +150	°C
Lead Temperature&Time		260°C,10S	--
Human Body Mode ESD Level (HBM)		5.5	KV

Note1: Exceeding or exposure to these absolute rating limits may damage the device permanently or affect its reliability

Recommended Operating Conditions

Parameter	Value	Unit
Supply Voltage	3~20	V
Operating Junction Temperature	0 ~ +125	°C
Operating Ambient Temperature	-40~ +85	°C

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Electrical Characteristics

V_{OUT}=3.3V, T_A=25℃ , unless otherwise noted.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}		3	--	20	V
Output Voltage Accuracy	ΔV_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=1mA	-2	V_{OUT}	+2	%
Output Current	I_{OUT}	Within $P_{D(Max.)}$	500	--	--	mA
Quiescent Current	I_Q	I_{OUT}=0A	--	2	--	μA
Dropout Voltage	V_{DROP}	V_{OUT}= 3.3V, I_{OUT}= 100mA, ΔV_{OUT}=2%	--	140	--	mV
		V_{OUT}= 5V, I_{OUT}= 100 mA, ΔV_{OUT}=2%	--	115	--	mV
Line Regulation	ΔV_{LINE}	V_{IN}= 5~12V, I_{OUT}=1mA	--	--	6	mV
Load Regulation	ΔV_{LOAD}	V_{IN}=12V, I_{OUT}=1~100 mA	--	--	20	mV
Short Circuit/Start Carrying Current	I_{SHORT}	VOUT Short to GND with 1Ω	--	60	--	mA
VOUT Temperature Coefficient	ΔV_{OUT} /(ΔT_A*V_{OUT})	I_{OUT}=1mA, 0°C ≤ T_A ≤ 120°C	--	90	--	ppm/°C
Power Supply Rejection Rate	PSRR	V_{IN}=5V_{DC}+0.5V_{P-P} f=10KHz, I_{OUT}=1mA	--	70	--	dB
Thermal shutdown Protection (OTP)	TSD	V_{IN}=V_{OUT} + 2 V, I_{OUT}=20mA		150		°C
OTP hysteresis	TSD_HYS			20		°C

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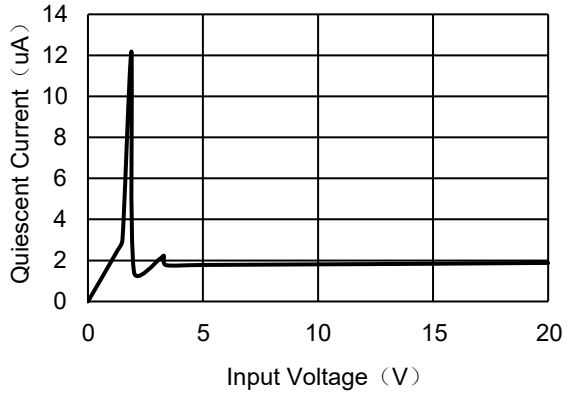
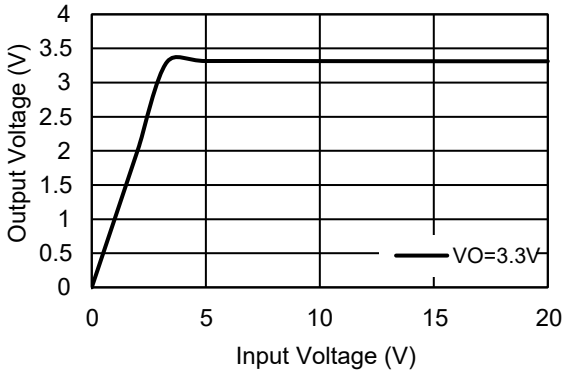
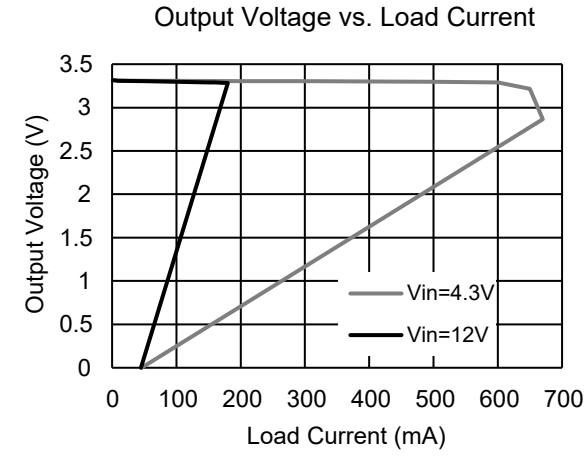
Typical Electrical Curves

Test conditions: C_{IN}=1uF, C_{OUT}=10uF, V_{IN}=5V, V_{OUT}=3.3V,T_{OPR}=25℃(unless otherwise noted)

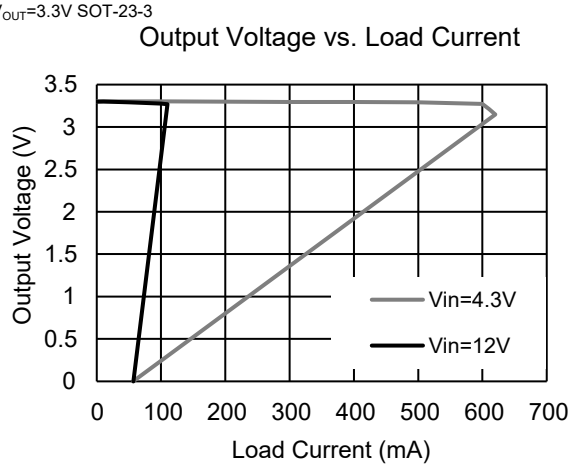




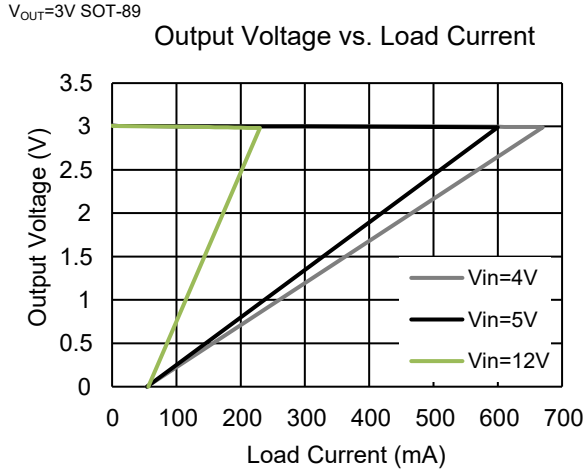
V_{OUT}=3.3V SOT-89



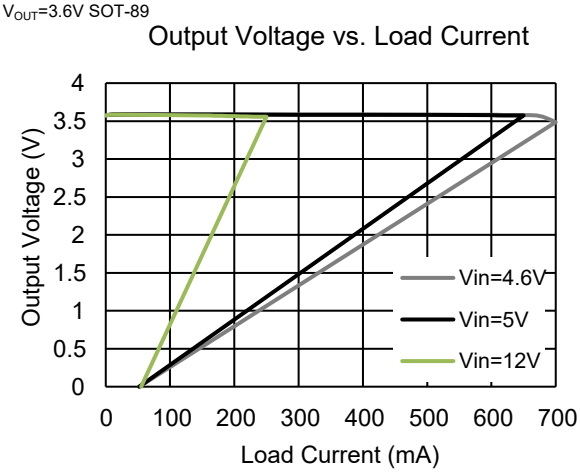
V_{OUT}=3.3V SOT-23-3



V_{OUT}=3V SOT-89



V_{OUT}=3.6V SOT-89



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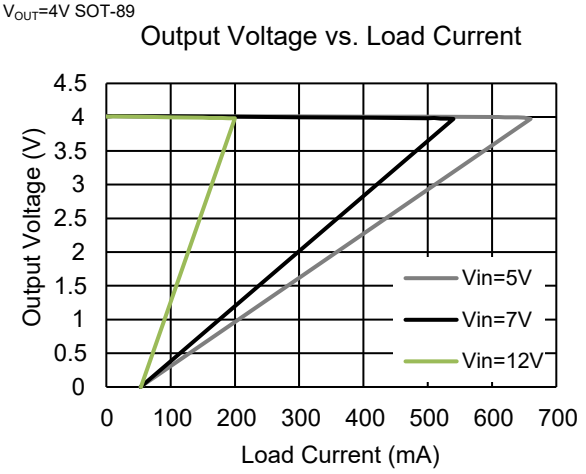
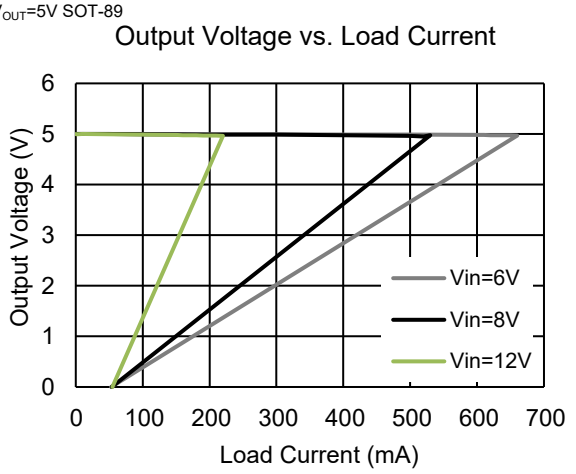
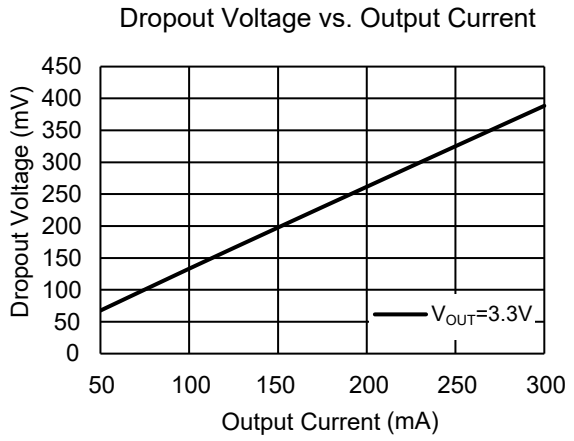
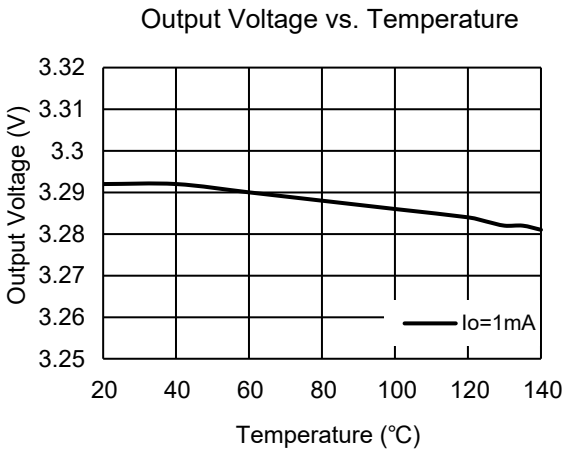
V_{OUT}=4V SOT-89



V_{OUT}=5V SOT-89

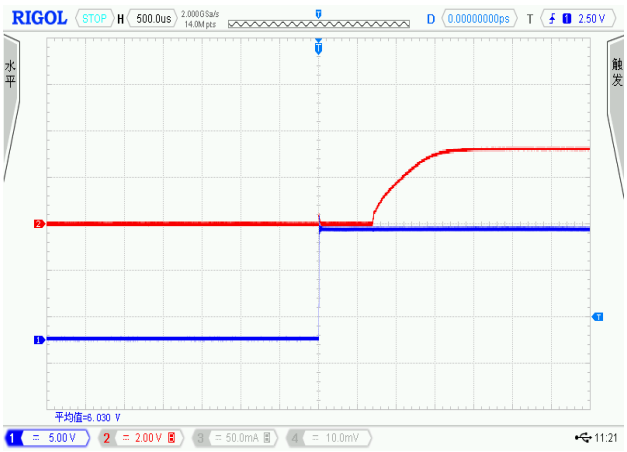


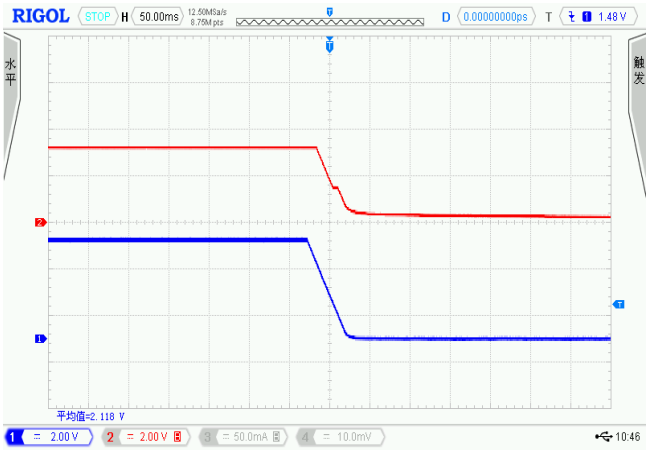




Power ON/OFF

CH1：VIN　　CH2：VOUT





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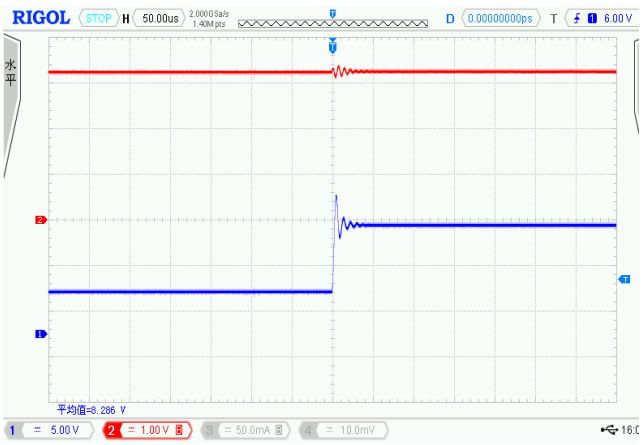
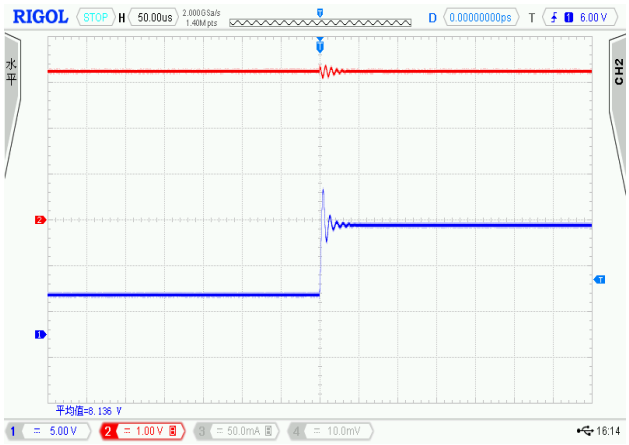
Line Transient

CH1:VIN CH2：VOUT

VIN=5V to 12V,Io=0A



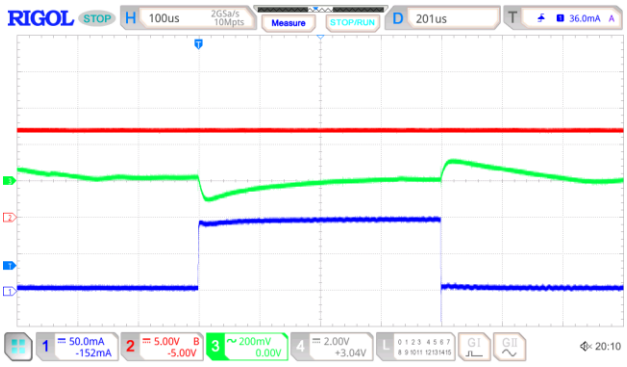
VIN=5V to 12V Io=10mA



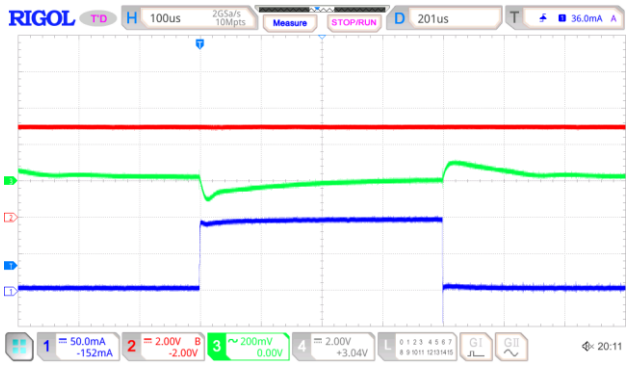
Load Transient

CH1：IOUT CH2：VIN CH3：VOUT

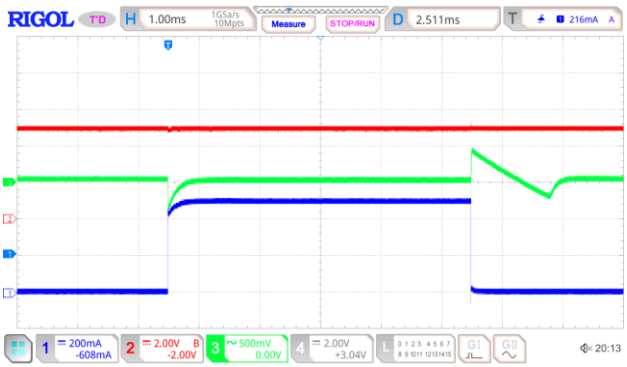
VIN=12V, VO=3.3V, C_{IN}=1uF, C_O=10uF Io=3mA to 100mA



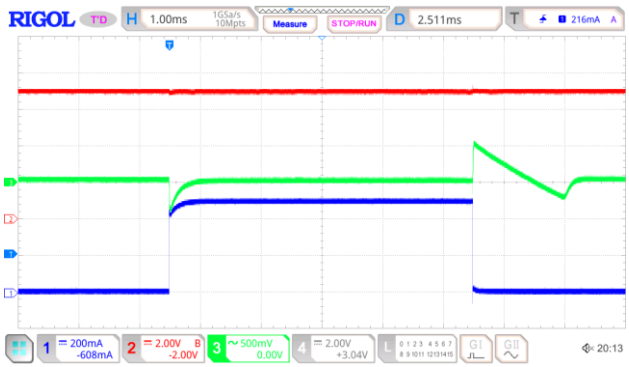
VIN=7V, VO=3.3V, C_{IN}=1uF, C_O=10uF Io=3mA to 100mA



VIN=5V, VO=3.3V, C_{IN}=1uF, C_O=10uF Io=3mA to 500mA



VIN=7V, VO=3.3V, C_{IN}=1uF, C_O=10uF Io=3mA to 500mA



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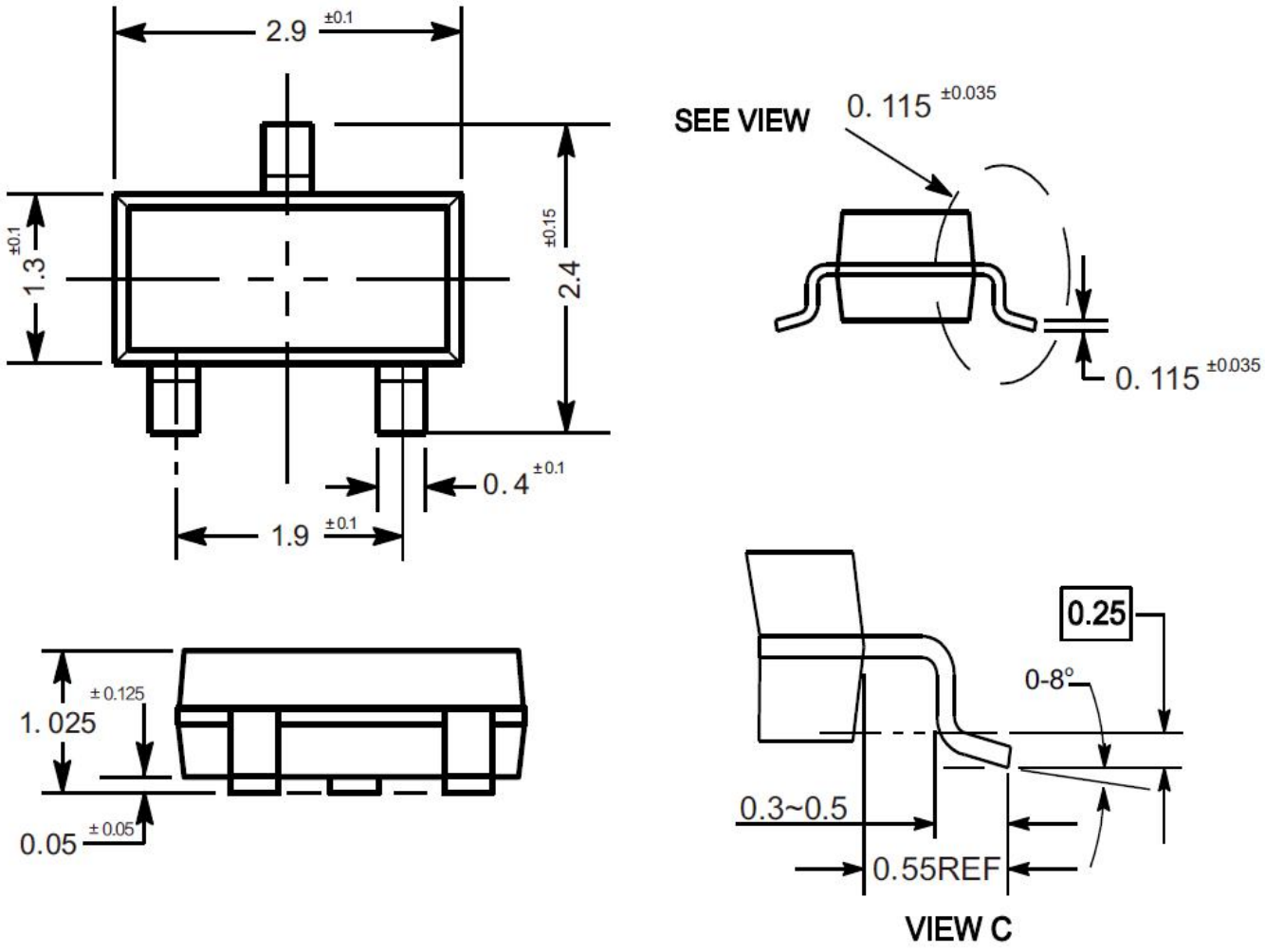
Package Outline

SOT-23

Dimensions in mm



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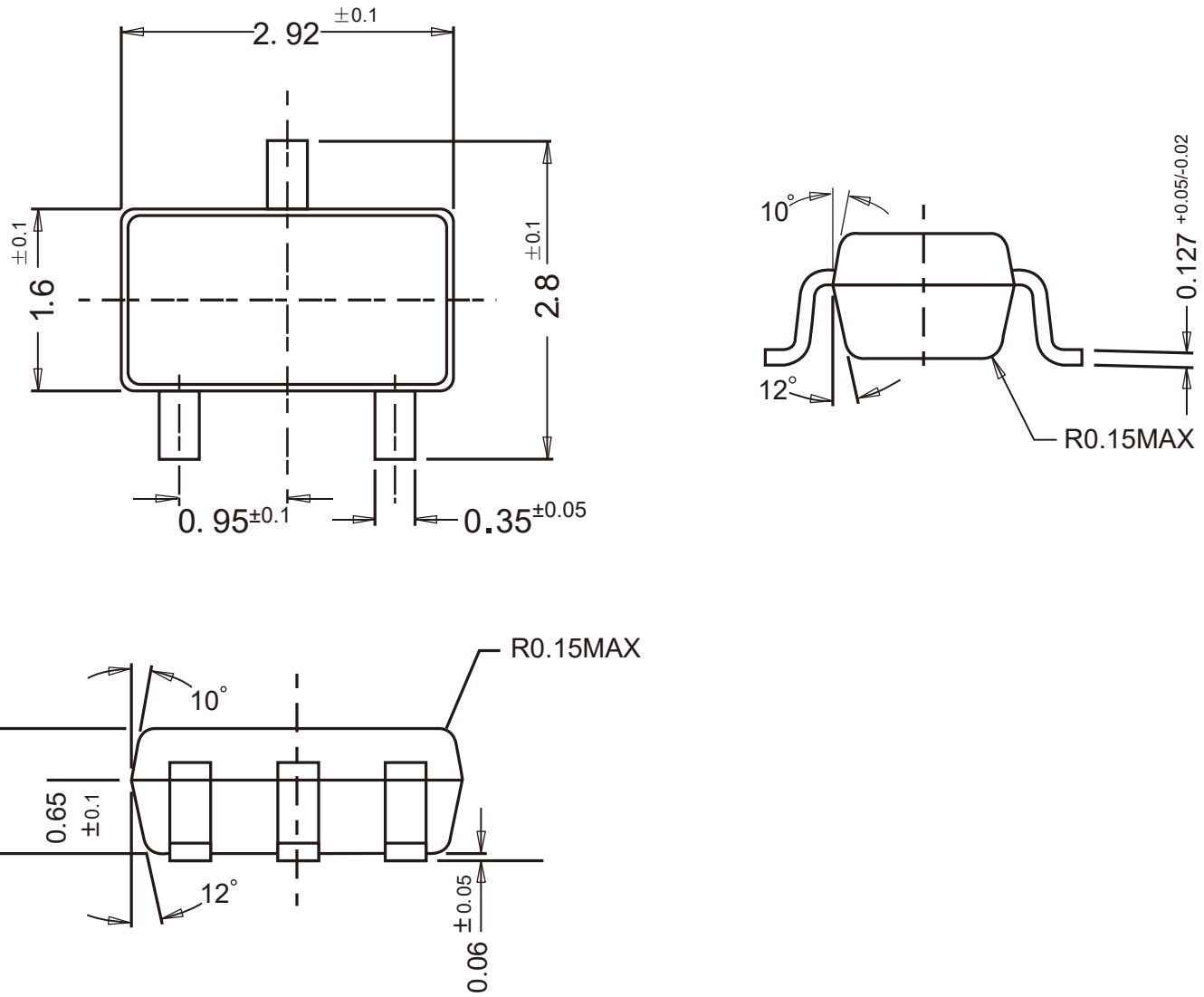
Package Outline

SOT-23-3

Dimensions in mm



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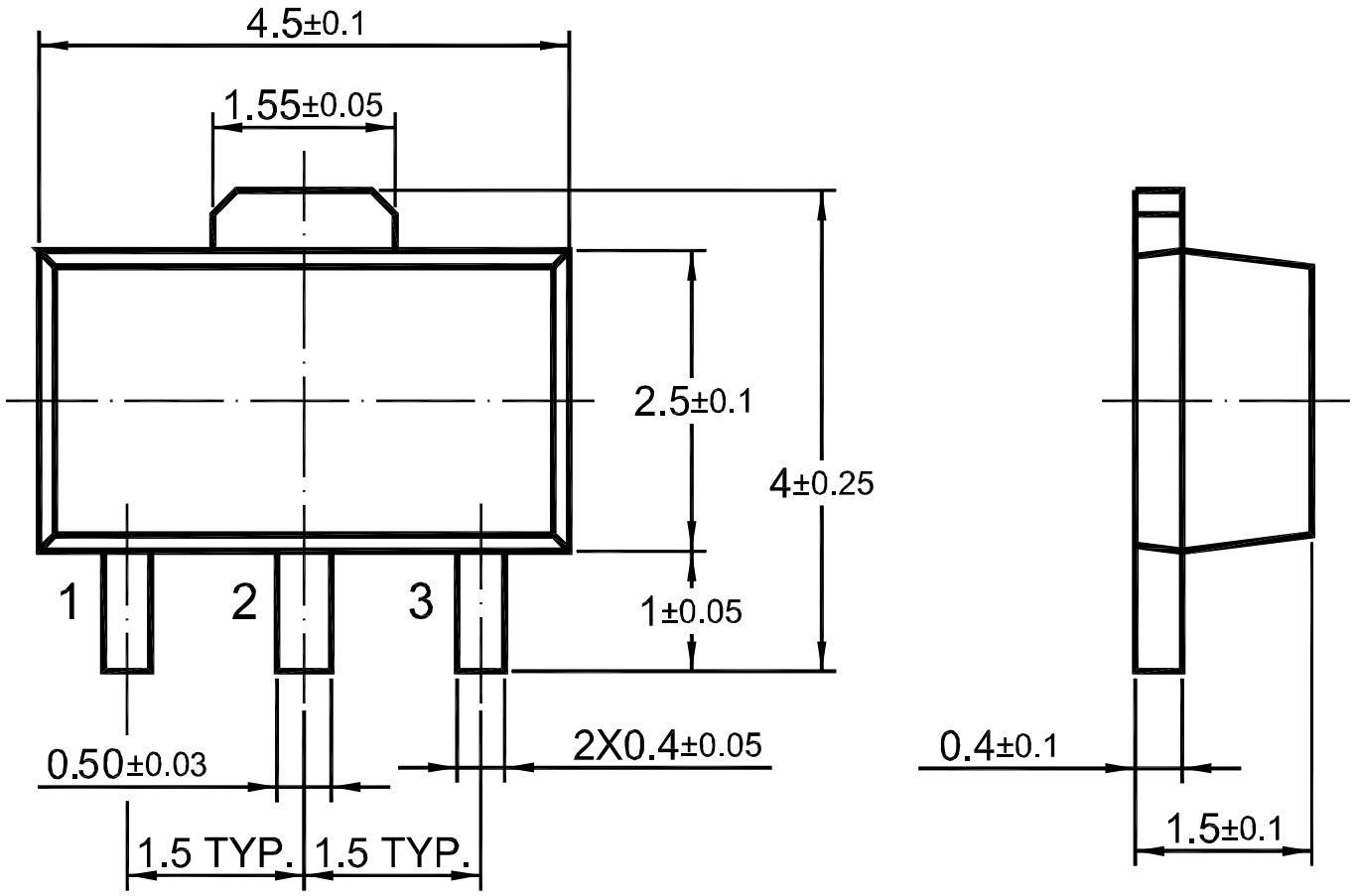
Package Outline

SOT-89

Dimensions in mm



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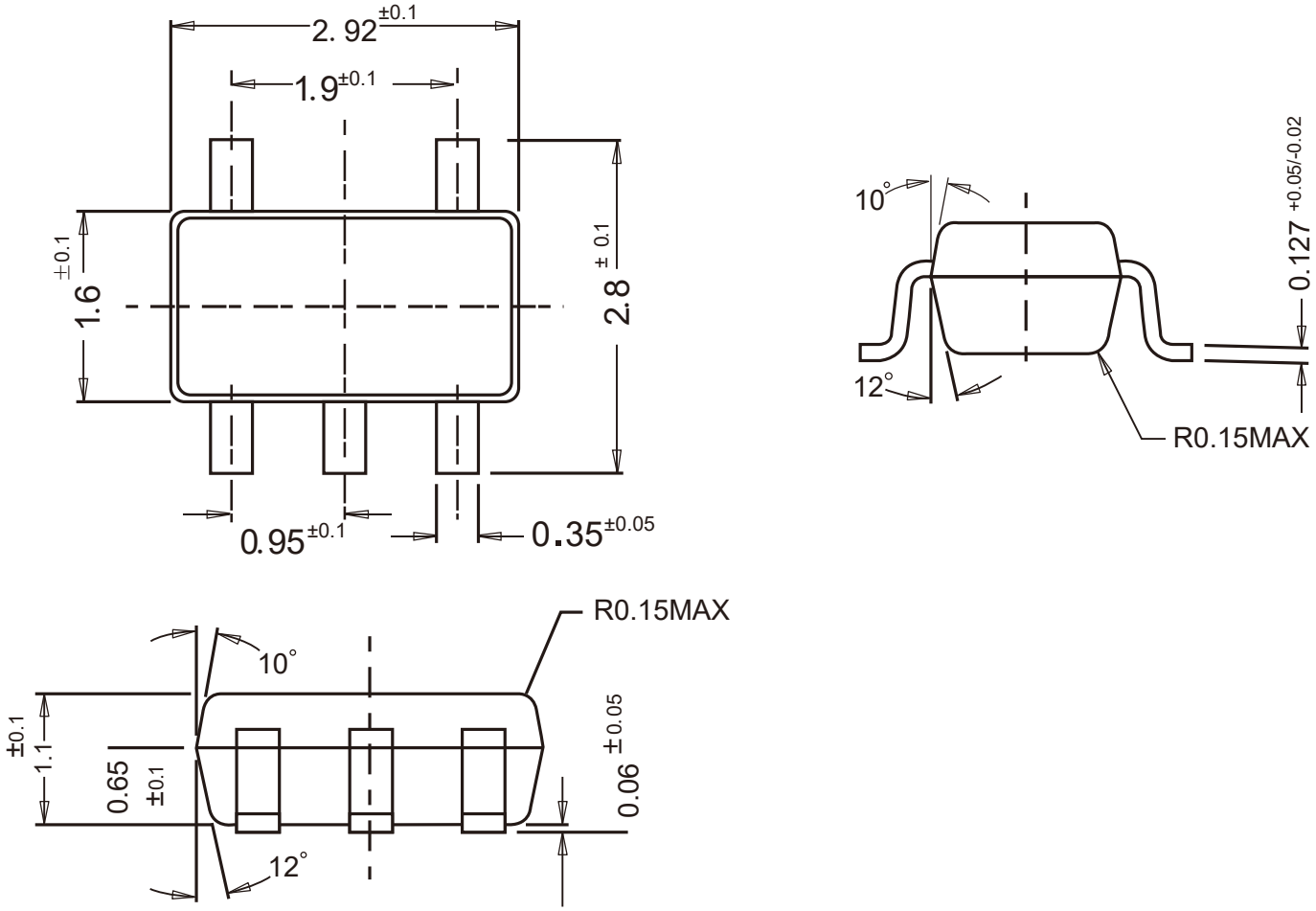
Package Outline

SOT-23-5 Dimensions in mm



Contact Information

TANI website: **http://www.tanisemi.com** Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up -to- date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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