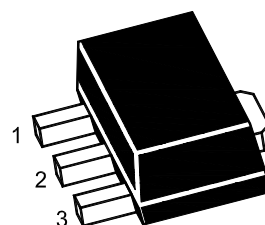


Features

- Input voltage: up to 30~35V
- Output voltage: 5~33V
- Output current up to 200 mA, internal thermal overload protection and short-circuit current limiting.

SOT-89


1. VOUT 2. GND 3. VIN

Marking Code

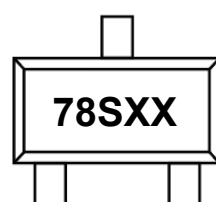
- TN78S05SQ: 78S05
- TN78S06SQ: 78S06
- TN78S33SQ: 78S09

Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Input Voltage	V_I	TN78S05SQ: 35	V
		TN78S06SQ: 30	
		TN78S33SQ: 30	
Output Current	I_O	200	mA
Maximum Power Dissipation	P_D	500	mW
Junction Temperature	T_J	TN78S05SQ: 35	°C
		TN78S06SQ: 30	
		TN78S33SQ: 30	
Operating Temperature Range	T_{OPR}	-40 to +120	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C

Ordering Information

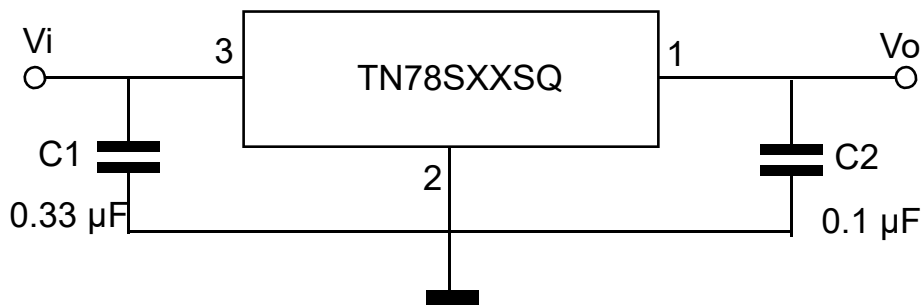
Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
TN78S05SQ	SOT-89	7	1,000PCS/Reel&7inches 3,000PCS/Reel&13inches	RoHS & Green	MSL1	
TN78S06SQ						
TN78S33SQ						

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.

Typical Application Circuit

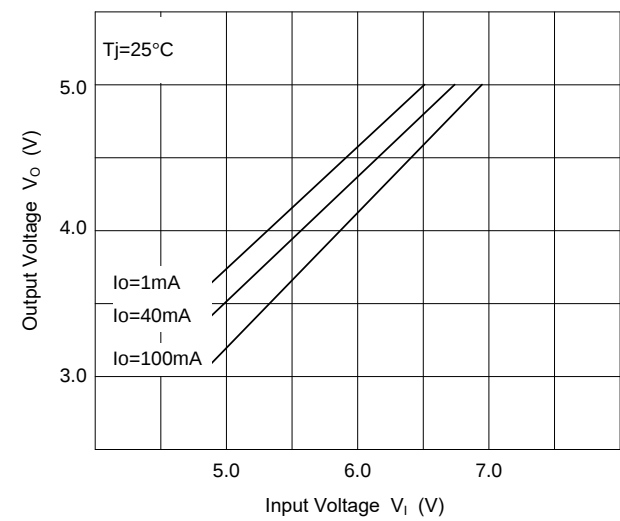
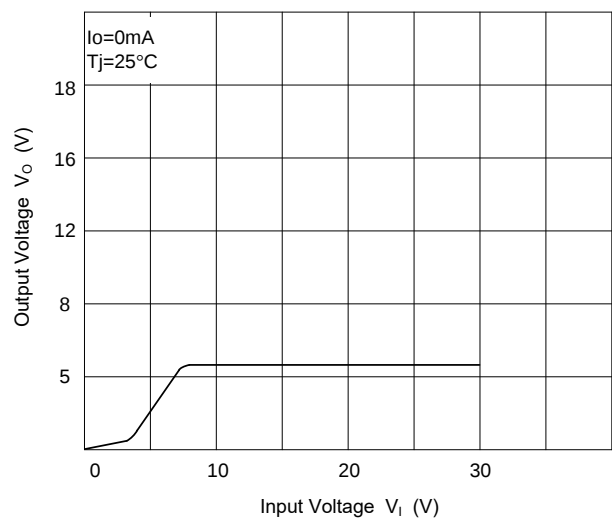
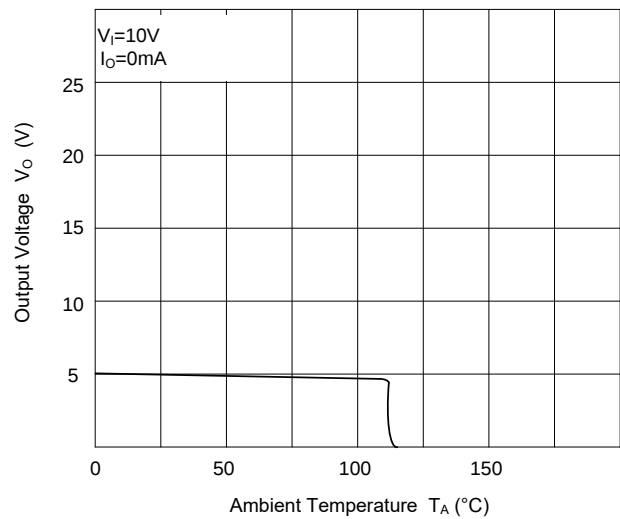
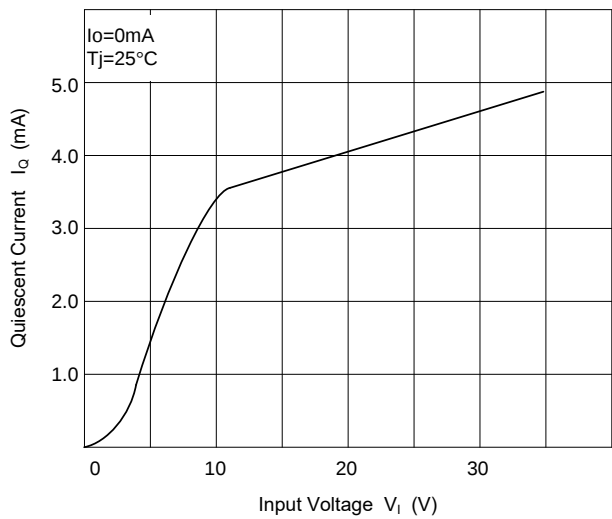
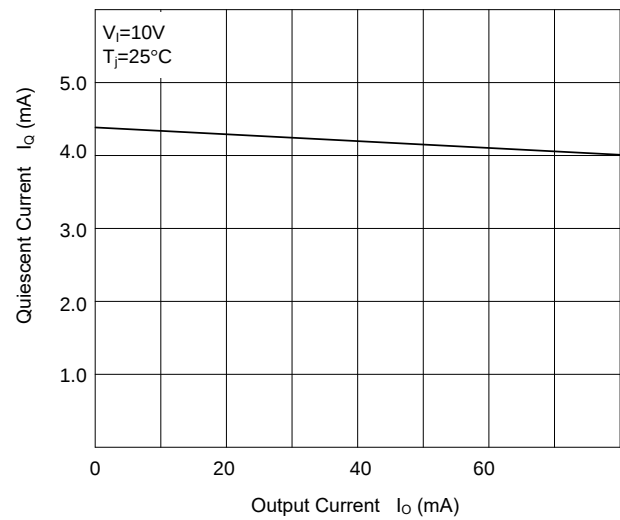
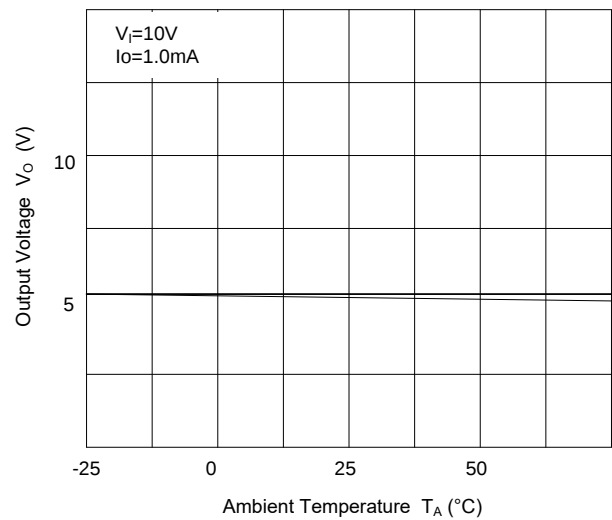


TN78S05SQ Electrical Characteristics

Ratings at 0°C≤TJ≤125°C Vi=10V, Io=40mA, Ci=0.33μF,Co=0.1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vo	TJ=25°C	4.80	5.0	5.2	V
		Io=1mA to 40mA, Vi=7V to 20V	4.75	5.0	5.25	V
		Io=1mA to 70mA,Vi=10V	4.75	5.0	5.25	V
Line Regulation	ΔVo	Vi=7V to 20V, TJ=25°C	--	8	150	mV
		Vi=8V to 20V, TJ=25°C	--	6	100	mV
Load Regulation	ΔVo	Io=1mA to 100mA ,TJ=25°C	--	11	60	mV
		Io=1mA to 40 mA, TJ=25°C	--	5	30	mV
Ripple Rejection	RR	Vi=8V to 20V, f=120Hz, TJ=25°C	40	49	--	dB
Dropout Voltage	VD	TJ=25°C	--	1.7	--	V
Quiescent Current	Iq		--	2	5.5	mA
Quiescent Current Change	ΔIq	Vi=8V to 20V	--	--	1.5	mA
		Io=1mA to 40mA	--	--	0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100KHz	--	40	--	μV

TN78S05SQ Typical Characteristic Curves



TN78S06SQ Electrical Characteristics

Ratings at 0°C≤T_J≤125°C V_I=11V, I_O=40mA, C_I=0.33μF,C_O=0.1μF,unless otherwise specified.

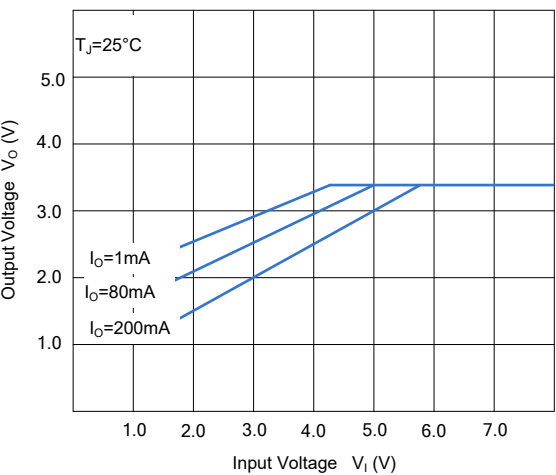
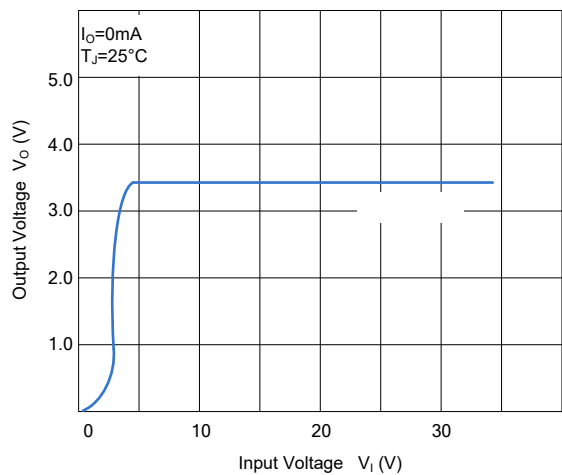
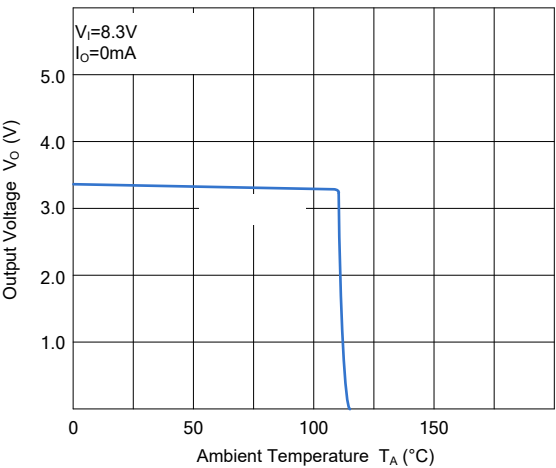
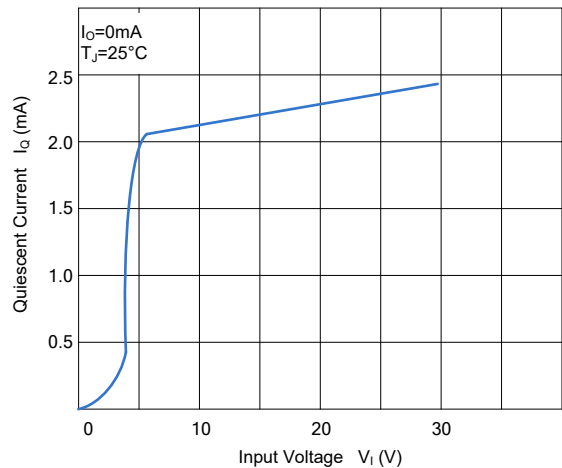
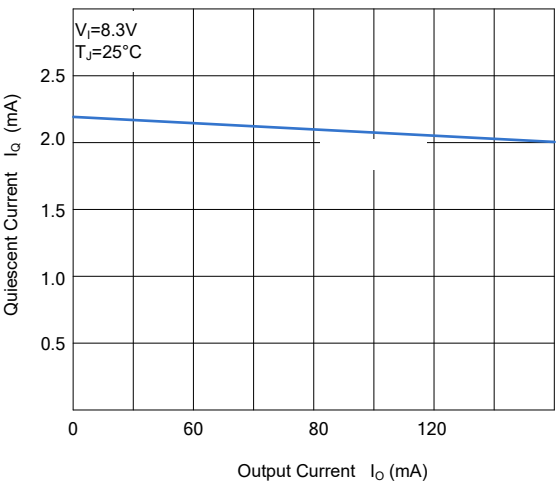
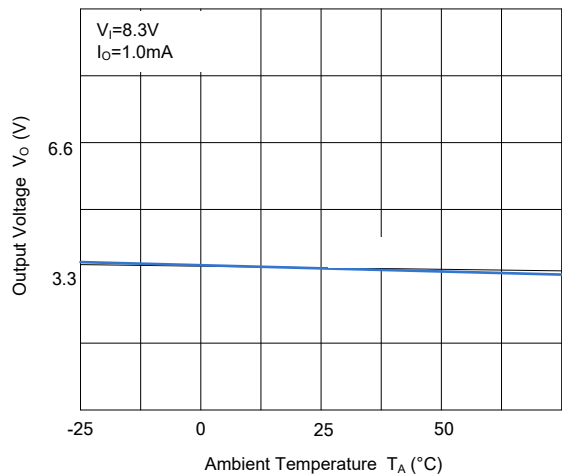
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V _O	T _J =25°C	5.75	6.0	6.25	V
		I _O =1mA to 80mA, V _I =8.5V to 20V	5.7	6.0	6.3	V
		I _O =1mA to 140mA	5.7	6.0	6.3	V
Line Regulation	ΔV _O	V _I =8.5V to 20V, T _J =25°C	--	12	150	mV
		V _I =9V to 20V, T _J =25°C	--	6	100	mV
Load Regulation	ΔV _O	I _O =1mA to 200mA ,T _J =25°C	--	18	60	mV
		I _O =1mA to 80mA, T _J =25°C	--	12	30	mV
Ripple Rejection	RR	V _I =9V to 20V, f=120Hz, T _J =25°C	38	46	--	dB
Dropout Voltage	V _D		--	1.7	--	V
Quiescent Current	I _Q	T _J =25°C	--	2	5.5	mA
Quiescent Current Change	ΔI _Q	V _I =9V to 20V	--	--	1.5	mA
		I _O =1mA to 80mA	--	--	0.1	mA
Output Noise Voltage	V _N	10Hz≤f≤100KHz	--	50	--	μV

TN78S33SQ Electrical Characteristics

$V_I=8.3V, I_O=80mA, 0<T_J<125^{\circ}C, C_I=0.33\mu F, C_O=0.1\mu F$, unless otherwise specified.

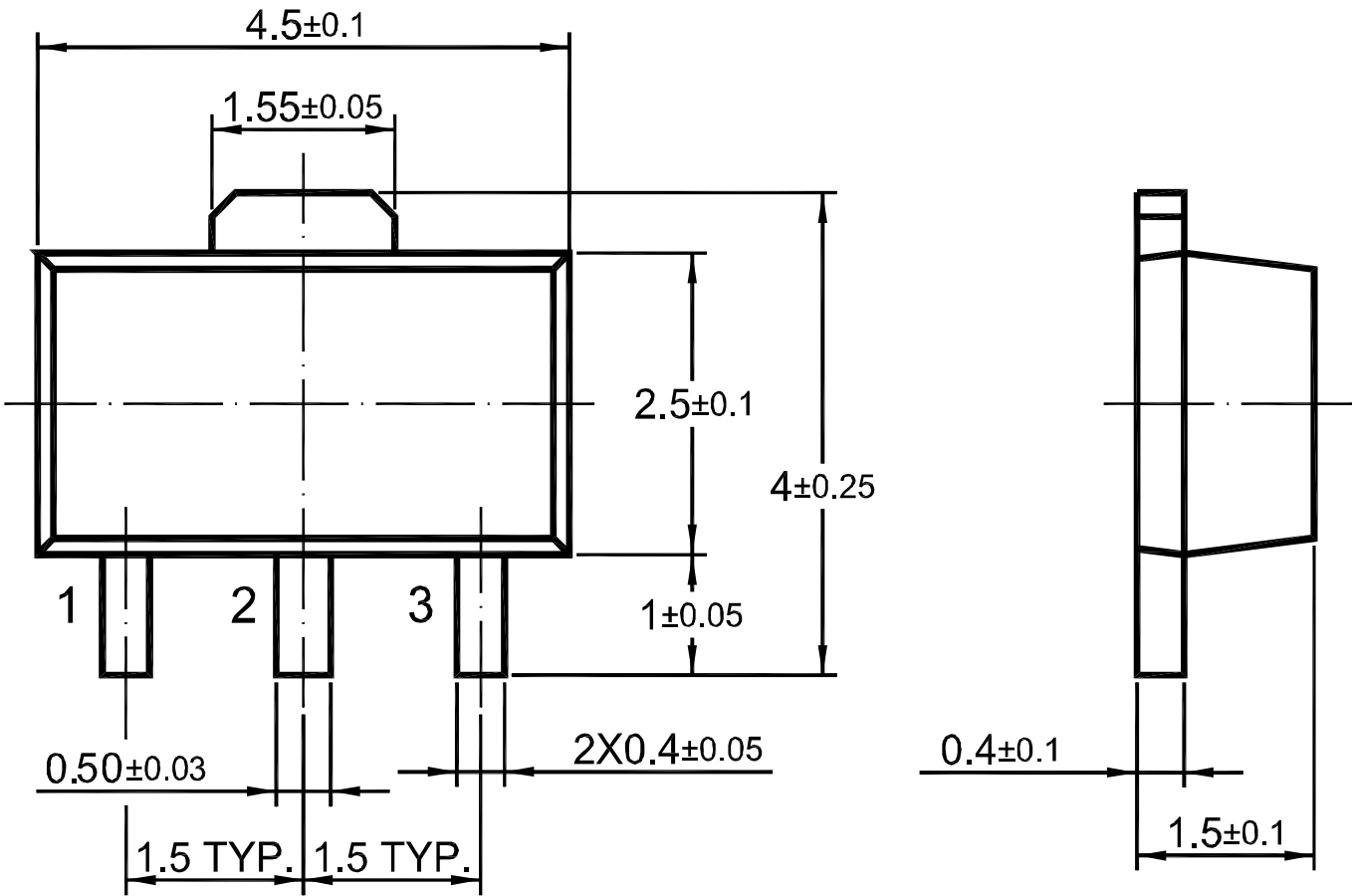
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	3.168	3.3	3.432	V
		$I_O=1mA$ to 80mA, $V_I=5.3V$ to 20V	3.135	--	3.465	V
		$I_O=1mA$ to 140mA	3.135	--	3.465	V
Line Regulation	ΔV_O	$V_I=5.3V$ to 20V, $T_J=25^{\circ}C$	--	7	150	mV
		$V_I=6.3V$ to 20V, $T_J=25^{\circ}C$	--	4	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to 200mA, $T_J=25^{\circ}C$	--	10	60	mV
		$I_O=1mA$ to 80 mA, $T_J=25^{\circ}C$	--	7	30	mV
Ripple Rejection	RR	$V_I=9V$ to 20V, $f=120Hz, T_J=25^{\circ}C$	40	49	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=6.3V$ to 20V	--	--	1.5	mA
		$I_O=1mA$ to 80mA	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz, T_J=25^{\circ}C$	--	40	--	$\mu V/V_O$

TN78S33SQ Typical Characteristic Curves



Package Outline

SOT-89 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.

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