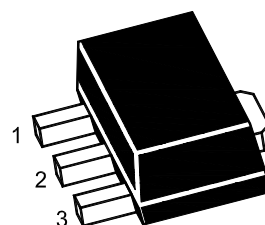


Features

- 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

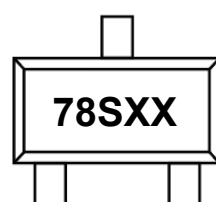
- TN78S05SQ: 78S05
- TN78S06SQ: 78S06
- TN78S33SQ: 78S09

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

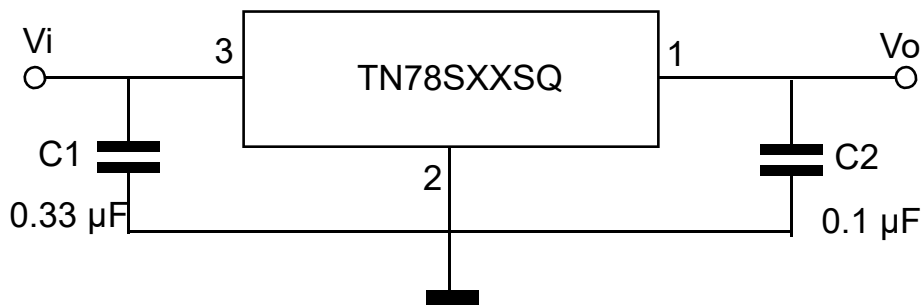
Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
TN78S05SQ	SOT-89	7	1,000PCS/Reel&7inches 3,000PCS/Reel&13inches	RoHS & Green	MSL1	
TN78S06SQ						
TN78S33SQ						

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

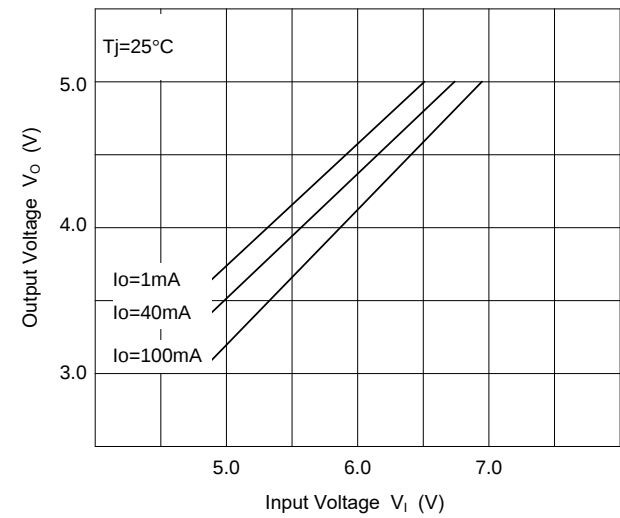
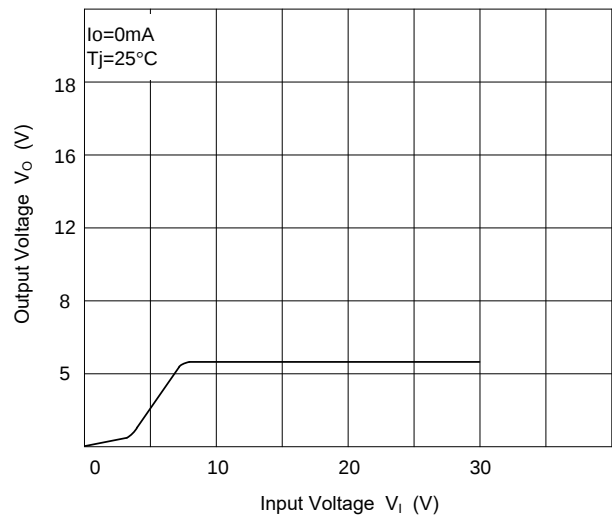
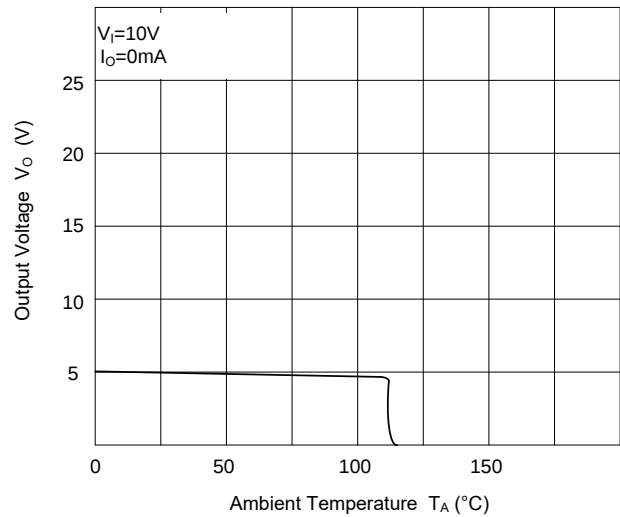
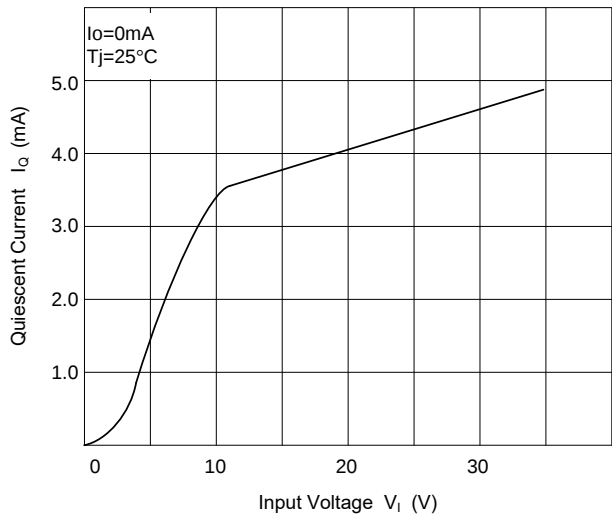
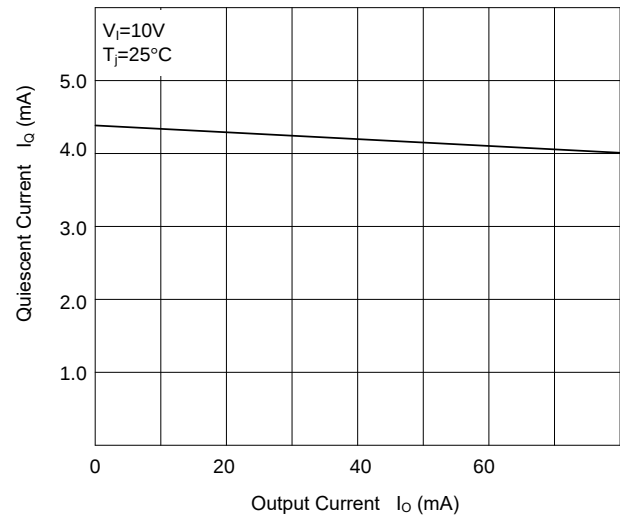
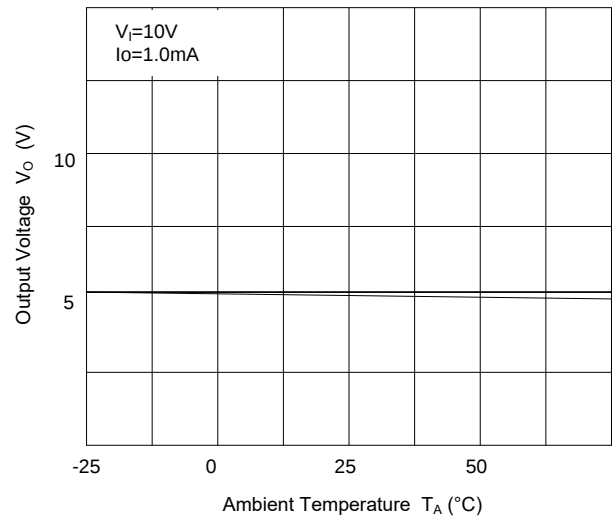


TN78S05SQ Electrical Characteristics

Ratings at $0^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$ $V_i = 10\text{V}$, $I_o = 40\text{mA}$, $C_1 = 0.33\mu\text{F}$, $C_o = 0.1\mu\text{F}$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_o	$T_J = 25^{\circ}\text{C}$	4.80	5.0	5.2	V
		$I_o = 1\text{mA to } 40\text{mA}$, $V_i = 7\text{V to } 20\text{V}$	4.75	5.0	5.25	V
		$I_o = 1\text{mA to } 70\text{mA}$, $V_i = 10\text{V}$	4.75	5.0	5.25	V
Line Regulation	ΔV_o	$V_i = 7\text{V to } 20\text{V}$, $T_J = 25^{\circ}\text{C}$	--	8	150	mV
		$V_i = 8\text{V to } 20\text{V}$, $T_J = 25^{\circ}\text{C}$	--	6	100	mV
Load Regulation	ΔV_o	$I_o = 1\text{mA to } 100\text{mA}$, $T_J = 25^{\circ}\text{C}$	--	11	60	mV
		$I_o = 1\text{mA to } 40\text{mA}$, $T_J = 25^{\circ}\text{C}$	--	5	30	mV
Ripple Rejection	RR	$V_i = 8\text{V to } 20\text{V}$, $f = 120\text{Hz}$, $T_J = 25^{\circ}\text{C}$	40	49	--	dB
Dropout Voltage	V_D	$T_J = 25^{\circ}\text{C}$	--	1.7	--	V
Quiescent Current	I_Q		--	2	5.5	mA
Quiescent Current Change	ΔI_Q	$V_i = 8\text{V to } 20\text{V}$	--	--	1.5	mA
		$I_o = 1\text{mA to } 40\text{mA}$	--	--	0.1	mA
Output Noise Voltage	V_N	$10\text{Hz} \leq f \leq 100\text{KHz}$	--	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.

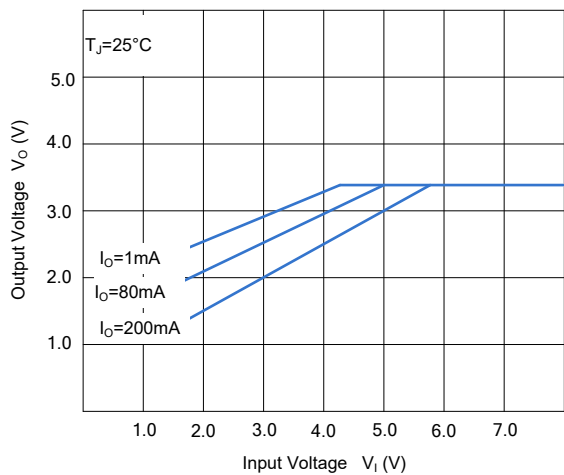
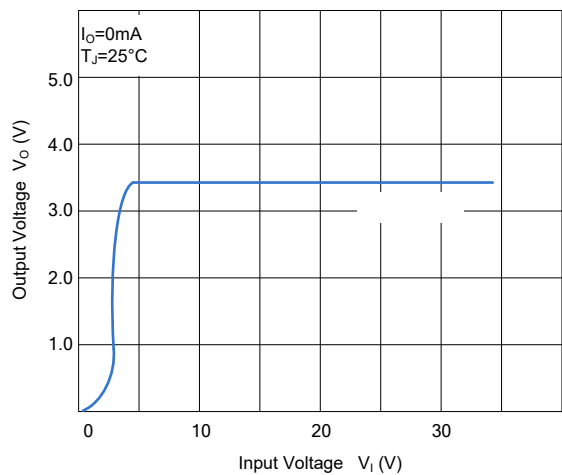
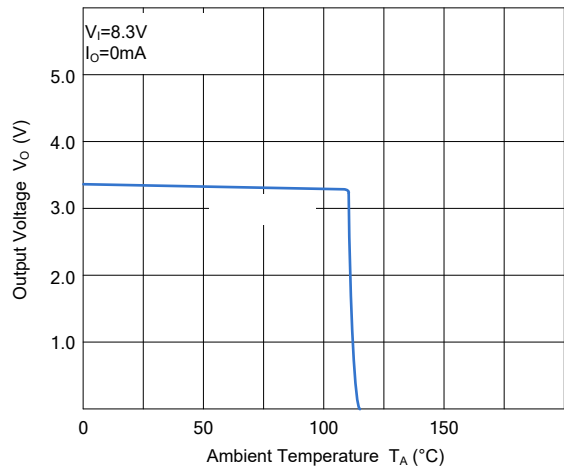
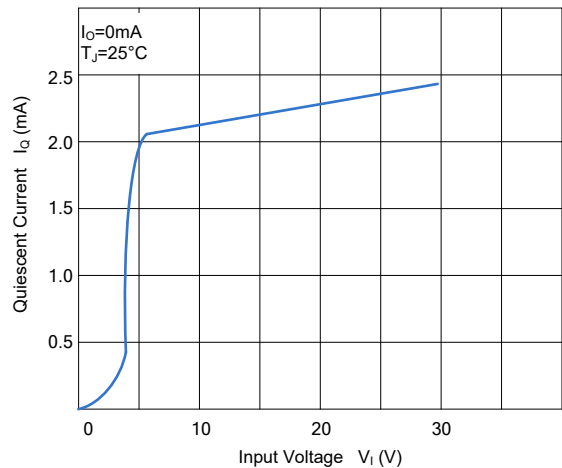
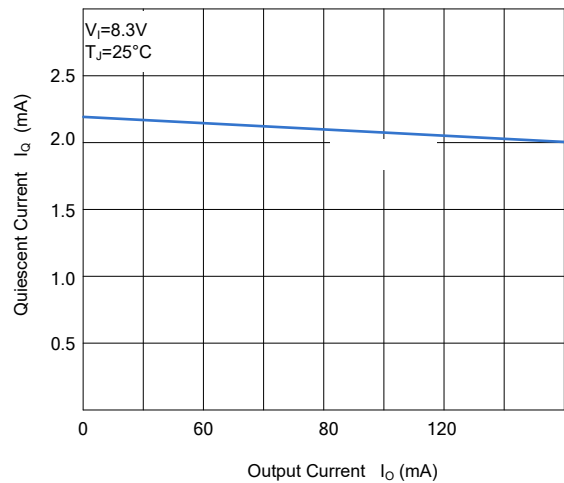
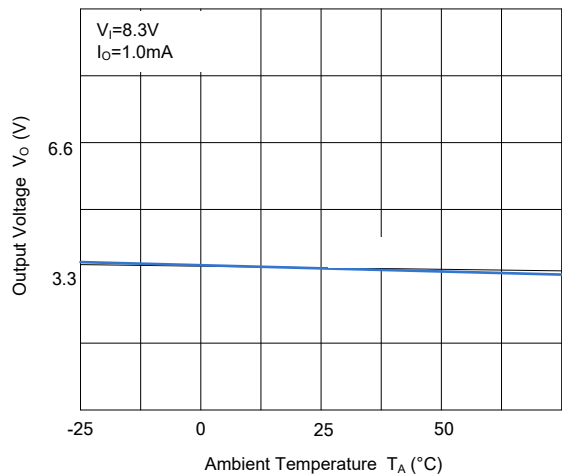
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V _O	T _J =25°C	5.75	6.0	6.25	V
		I _O =1mA to 80mA, V _I =8.5V to 20V	5.7	6.0	6.3	V
		I _O =1mA to 140mA	5.7	6.0	6.3	V
Line Regulation	ΔV _O	V _I =8.5V to 20V, T _J =25°C	--	12	150	mV
		V _I =9V to 20V, T _J =25°C	--	6	100	mV
Load Regulation	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.

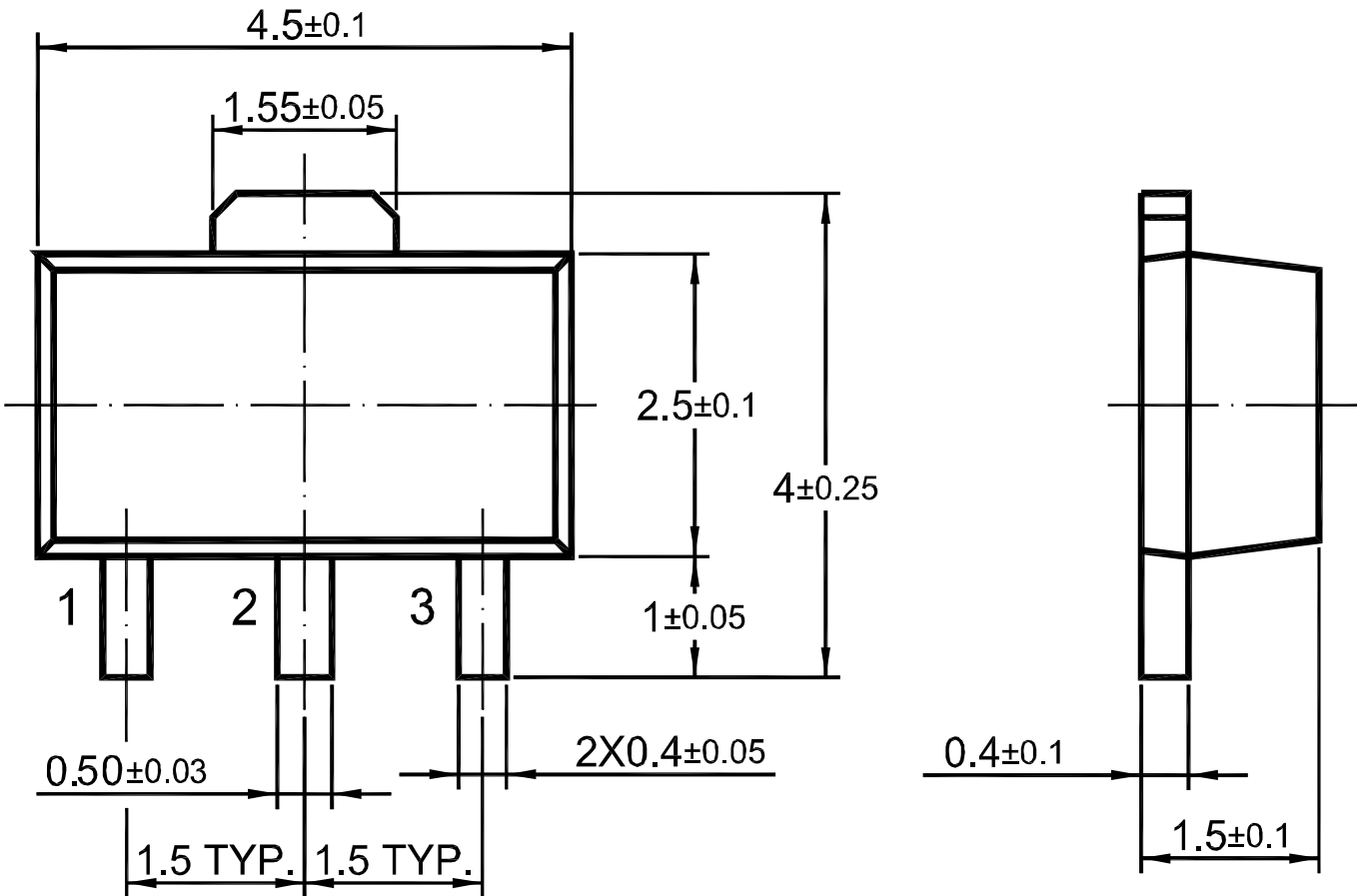
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	3.168	3.3	3.432	V
		$I_O=1mA$ to 80mA, $V_I=5.3V$ to 20V	3.135	--	3.465	V
		$I_O=1mA$ to 140mA	3.135	--	3.465	V
Line Regulation	ΔV_O	$V_I=5.3V$ to 20V, $T_J=25^{\circ}C$	--	7	150	mV
		$V_I=6.3V$ to 20V, $T_J=25^{\circ}C$	--	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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