SK78L05 150mA Fixed Output Voltage Regulator

General Description

The SK78L05 are three terminal positive regulators designed for a wide variety of applications including local, on-card regulation.

This series of regulators are completed with internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking is provided, these regulators can deliver output currents up to 150mA. And the output voltage is offered in voltage tolerance: 1%.

The SK78L05 series are available in SOT-23 and SOT-89 packages.

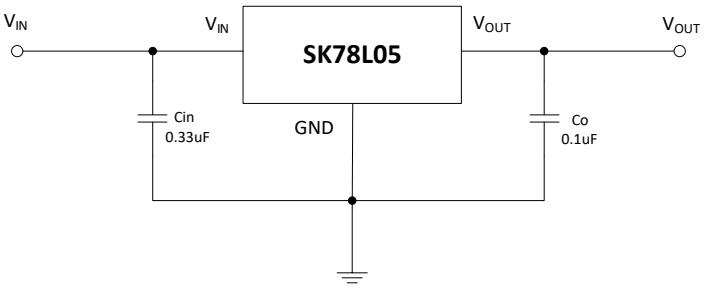
Features

- Output Current up to 150mA
- Fixed Output Voltages of 5V
- Output Voltage Accuracy: ±1%
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components
- Output Transistor Safe-Area Protection

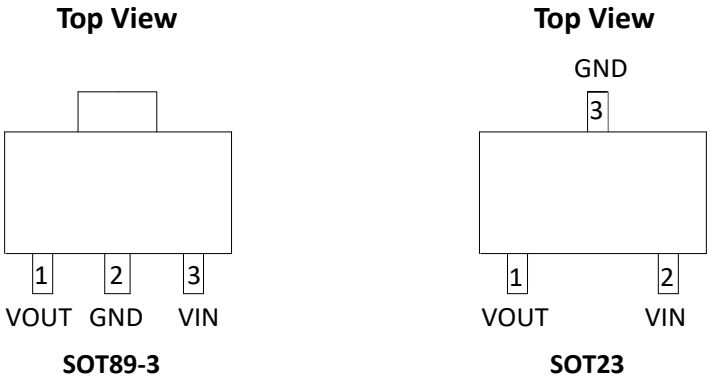
Applications

- Industry Applications
- Microprocessor Power Supplies
- Mother Boards

Typical Application Circuit



Pin Configuration



Pin Descriptions

SOT23	SOT89-3	PIN NAME	FUNCTION
1	1	VOUT	Output voltage pin
3	2	GND	GND pin
2	3	VIN	Input voltage pin

Ordering Information

Part No.	Package	Tape/Reel
SK78L05-T3A	SOT89-3	1000/Reel
SK78L05-S3	SOT23	3000/Reel

SK78L05 devices are Pb-free and RoHS compliant.

Absolute Maximum Ratings(Note 1)

(Operation temperature range applies unless otherwise specified.)

Parameter	Symbol	Range	Unit
Input Voltage	V_{IN}	36	V
Output Current	I_O	200	mA
Operating Junction Temperature	T_J	150	°C
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260	°C
Power Dissipation (SOT89-3)	P_D	600	mW
Storage Temperature Range	T_{STG}	-65 to 150	°C

Note(1): Absolute maximum ratings indicate stresses beyond which may cause permanent damage to the device.

ESD Ratings

Parameter	Symbol	Range	Unit
ESD rating, human body mode	HBM	2000	V
ESD rating, machine mode	MM	200	V

Recommended Operation Ratings

Parameter	Symbol	Min.	Max.	Unit
Input voltage	V_{IN}		30	V
Operating Temperature	T_A	-40	85	°C

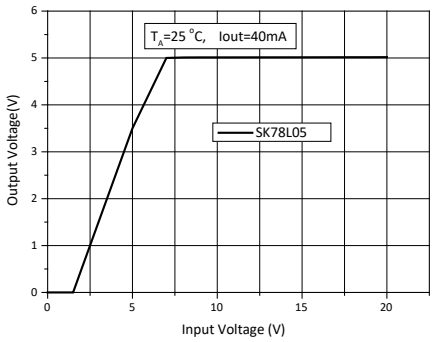
Electrical Characteristics

V_{IN} = 10V, I_O =40mA, C_{IN} = 0.33uF, C_{OUT}= 0.1uF, T_A=25°C, unless otherwise noted.

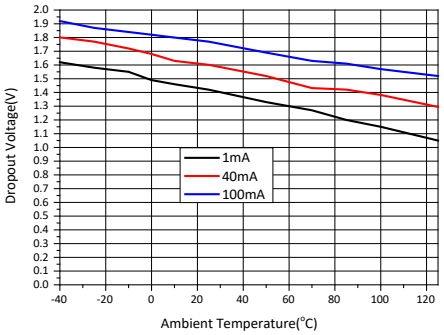
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O		5.0	5.05	5.1	V
Line Regulation	V_{RLINE}	V_{IN} = 7V ~ 20V		8	150	mV
Load Regulation	V_{RLOAD}	I_{OUT} = 1mA ~ 150mA		10	60	mV
Quiescent Current	I_Q			2.8	4.2	mA
Quiescent Current Change	ΔI_Q	V_{IN} = 8V ~ 20V		0.2	1.5	mA
		I_{OUT} = 1mA ~ 40mA		0.05	0.1	mA
Ripple Rejection	PSRR	f=120Hz, V_{IN} = 8V ~ 18V	47	62		dB
Dropout Voltage	V_{DROP}	I_{OUT} = 40mA		1.7		V
		I_{OUT} = 150mA		1.8		V
Output Noise Voltage	No	10Hz ≤f≤ 100kHz (Note 2)		40		μV
Output Voltage Temperature Coefficient	ΔVo/ΔT	=5mA		0.42		mV/°C
Over temperature Protection	OTP	V_{IN}=15V	160	180		°C

Note(2): 0.01μF minimum load capacitance is recommended to limit high frequency noise.

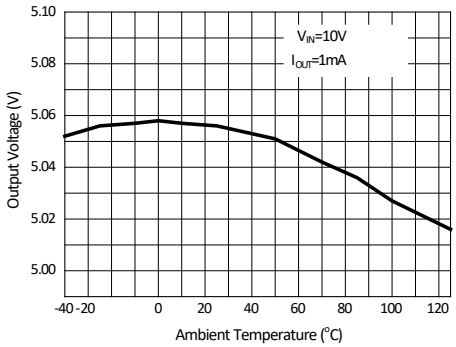
Typical Performance Characteristics



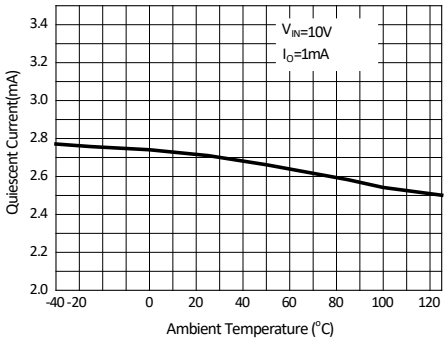
Output Voltage vs Input Voltage



Dropout Voltage vs Ambient Temperature

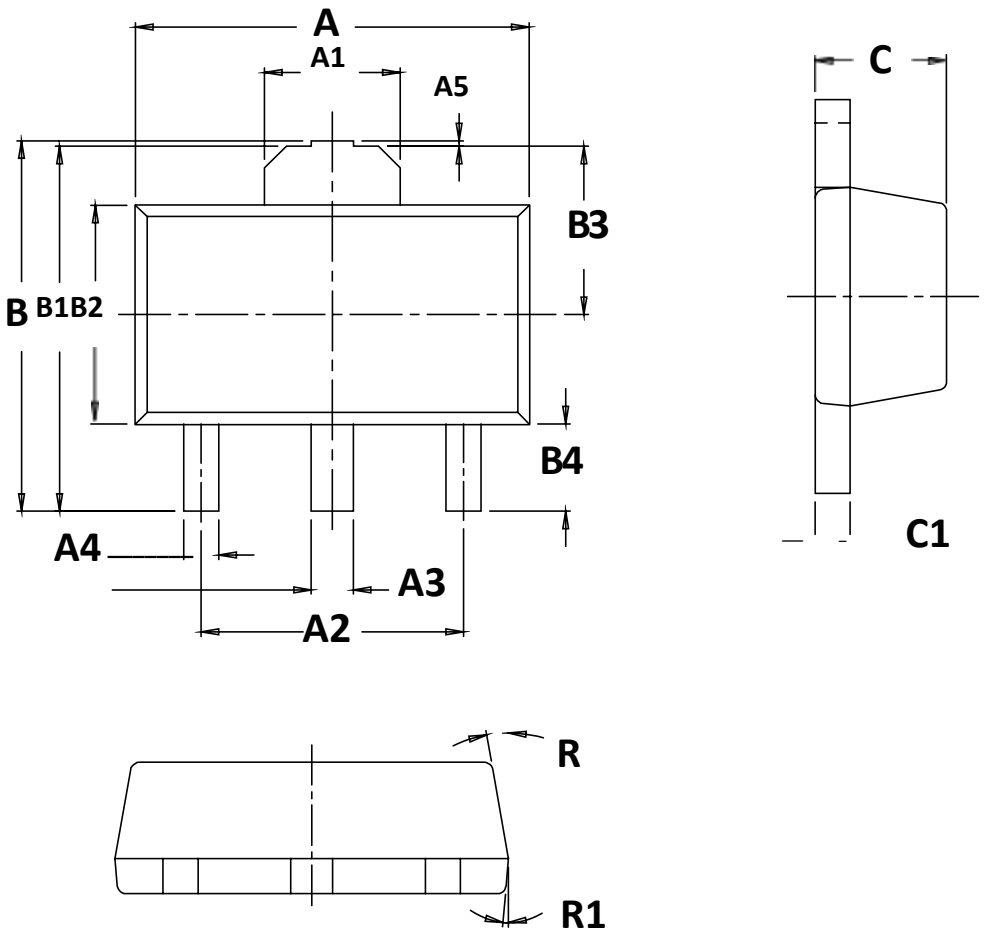


Output Voltage vs Ambient Temperature



Quiescent Current vs Ambient Temperature

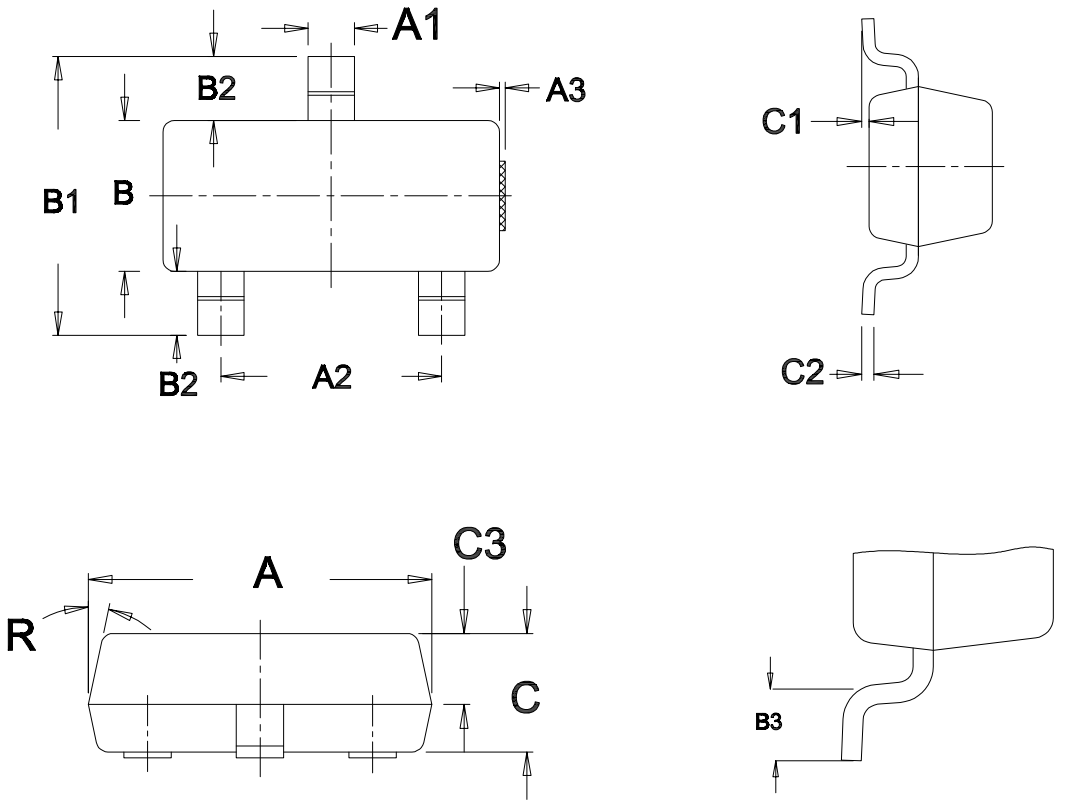
Package Dimension: SOT89-3



Unit: mm

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	4.45	4.50	4.55	**B1**	4.13	4.18	4.23
A1	1.50	1.55	1.60	**B2**	2.45	2.50	2.55
A2	2.98	3.00	3.03	**B3**	1.88	1.93	1.98
A3	0.46	0.48	0.51	**B4**	0.95	1.00	1.05
A4	0.38	0.40	0.43	**C**	1.45	1.50	1.55
A5	0.02	0.06	0.10	**C1**	0.39	0.40	0.41
B	4.14	4.24	4.34	**R**		10°	
				R1		5°	

Package Dimension: SOT23



Unit: mm

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	2.80	2.90	3.00	B3	0.27	0.37	0.47
A1	0.35	0.40	0.45	C	0.95	1.00	1.05
A2	1.85	1.90	1.95	C1	0.01	0.05	0.10
A3	-	-	0.12	C2	0.09	0.10	0.11
B	1.25	1.30	1.35	C3	0.55	0.60	0.65
B1	2.25	2.40	2.55	R		12°	
B2	0.50	0.55	0.60				