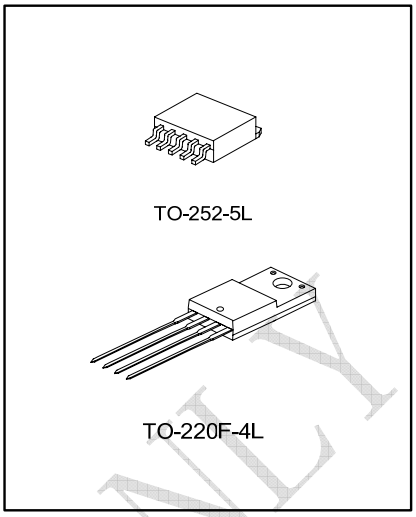
3A LDO VOLTAGE REGULATOR

DESCRIPTION

The SA378RXX is a positive voltage regulator with low dropout voltage below 0.5V at 3A.

The SA378RXX provides two versions: fixed and adjustable versions. The SA378RXX is available in fixed output voltages3.3V, 5V, 8V，9V, 12V, 15V and 18V. The SA378RXX offers some key features including thermal shutdown, peak current protection, overvoltage protection and output disable function. The SA378RXX is an excellent device for use in various electronic equipments.



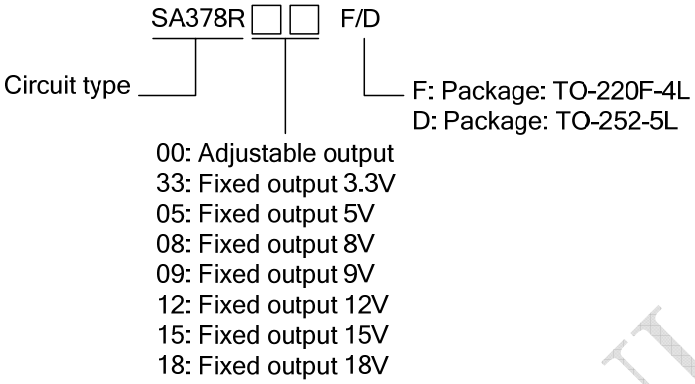
FEATURES

* Available fixed version 3.3V, 5V, 8V, 9V, 12V,15V, 18V and adjustable version
* Low Dropout Voltage: 300mV at 3A output current
* Current limiting: 4A
* Overvoltage protection: 40V
* Built-in output disable function
* TO-220 full-mold package (4pin) and TO-252-5L package(5pin)
* Overcurrent protection, thermal shutdown
* Overvoltage protection, short circuit protection

APPLICATIONS

* High Efficiency Linear Regulators
* Post Regulators for Switching Supplies
* Battery Charger
* Microprocessor Supply
* Desktop PCs, RISC and Embedded Processors Supply

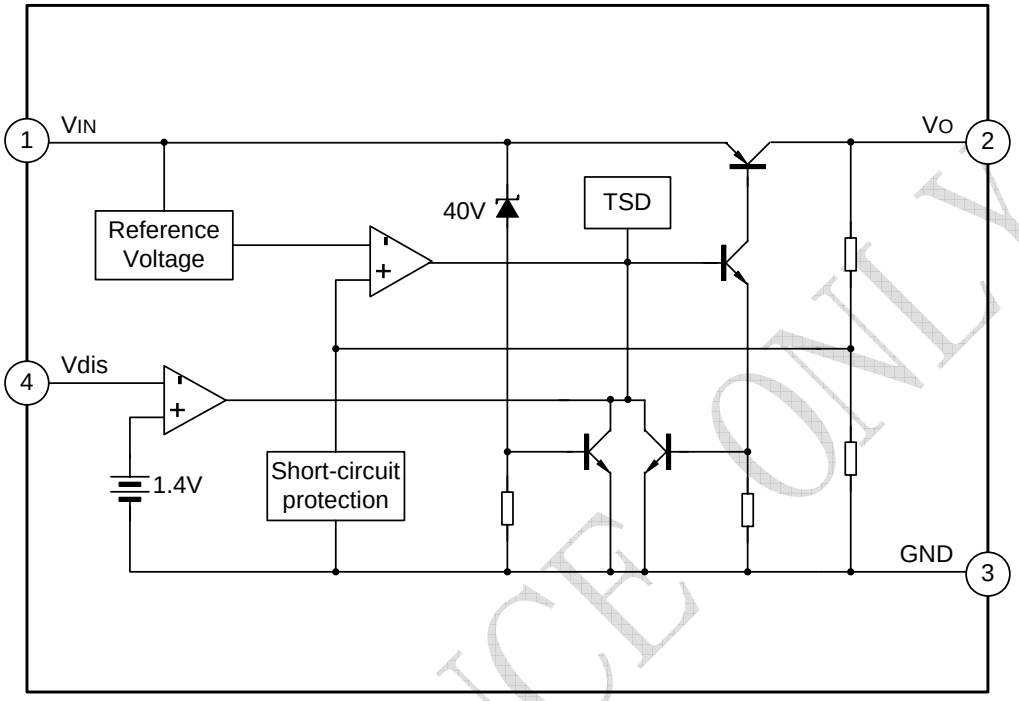
ORDERING INFORMATION (Tamb=-20~+80°C)



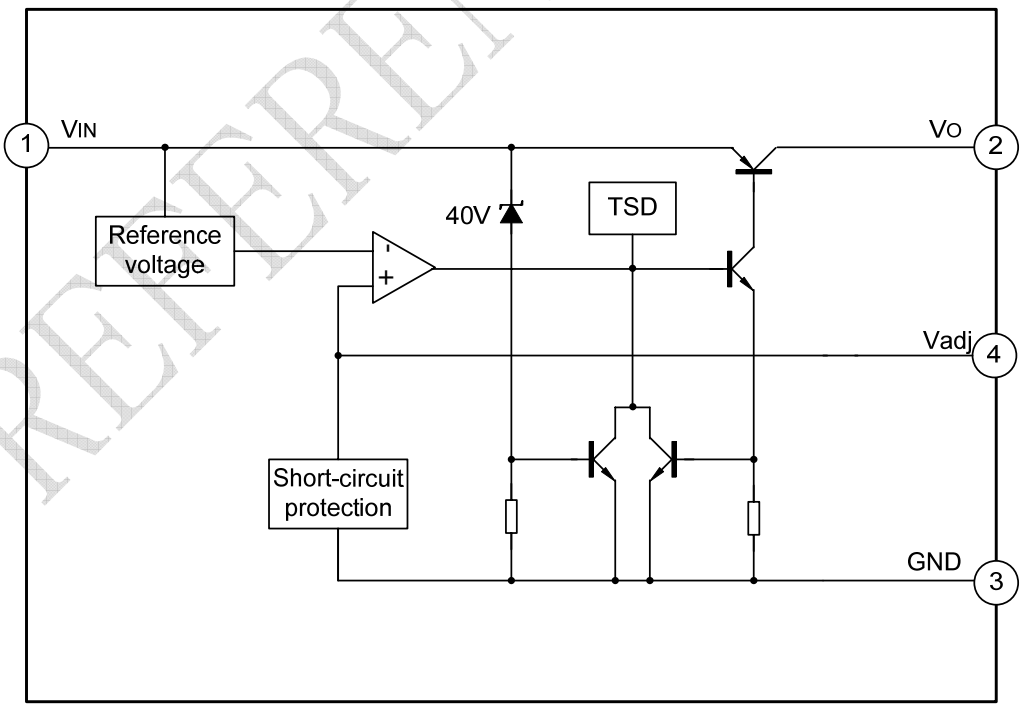
Part No.	Package	Marking	Packing Type
SA378R00F	TO-220F-4L	SA378R00F	Stick
SA378R33F		SA378R33F	Stick
SA378R05F		SA378R05F	Stick
SA378R08F		SA378R08F	Stick
SA378R09F		SA378R09F	Stick
SA378R12F		SA378R12F	Stick
SA378R15F		SA378R15F	Stick
SA378R18F		SA378R18F	Stick
SA378R33DTR	TO-252-5L	SA378R33D	Tape & Reel
SA378R05DTR		SA378R05D	Tape & Reel
SA378R08DTR		SA378R08D	Tape & Reel
SA378R09DTR		SA378R09D	Tape & Reel
SA378R12DTR		SA378R12D	Tape & Reel
SA378R15DTR		SA378R15D	Tape & Reel
SA378R18DTR		SA378R18D	Tape & Reel
SA378R33D	TO-252-5L	SA378R33D	Stick
SA378R05D		SA378R05D	Stick
SA378R08D		SA378R08D	Stick
SA378R09D		SA378R09D	Stick
SA378R12D		SA378R12D	Stick
SA378R15D		SA378R15D	Stick
SA378R18D		SA378R18D	Stick

BLOCK DIAGRAM

SA378RXXF

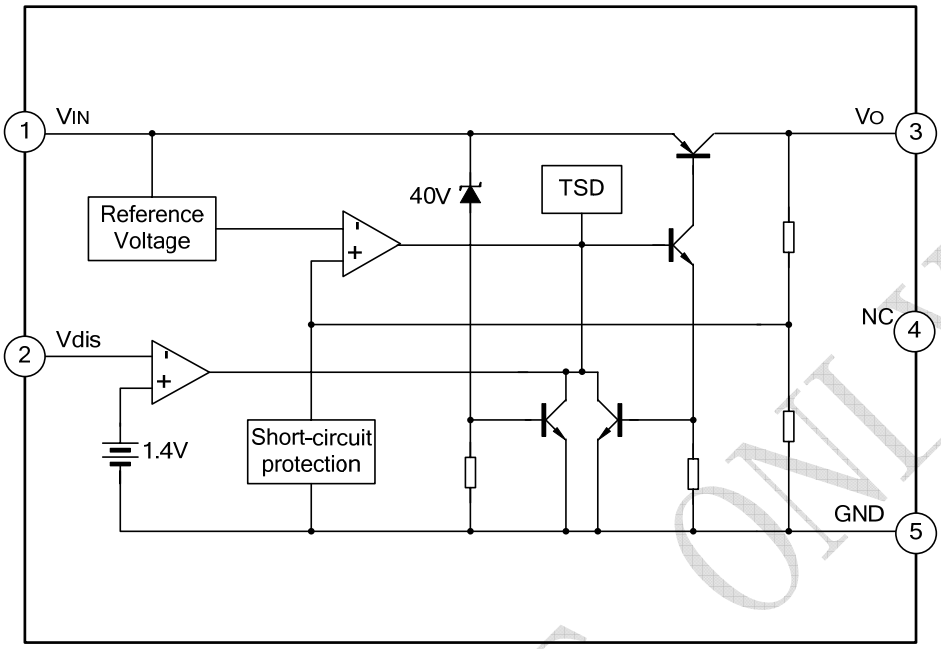


Fixed mode



Adjustable mode

SA378RXXD



Fixed mode

ABOSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Ratings	Unit
Input Supply Voltage	V_{IN}	35	V
Disable Voltage	V_{dis}	35	V
Output Current	I_o	3.0	A
Power Dissipation 1 (No Heatsink)	P_{d1}	1.5	W
Power Dissipation 2 (With Heatsink)	P_{d2}	15	W
Junction Temperature	T_J	150	°C
Operating Temperature Range	Topr	-20~+80	°C
Thermal Resistance, Junction-To Case	$R_{\theta jc}$	2.9	°C/W
Thermal Resistance, Junction-To Air	$R_{\theta ja}$	48.51	°C/W

RECOMMENDED OPERATING CONDITIONS

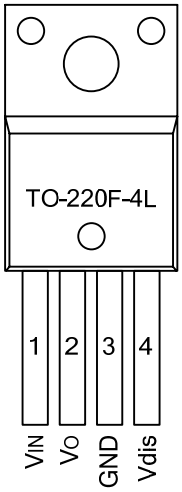
Characteristics	Symbol	Ratings		Unit
Input Voltage	V_{IN}	SA378R33	5	V
		SA378R05	7	
		SA378R08	10	
		SA378R09	11	
		SA378R12	15	
		SA378R15	20	
		SA378R18	21	

ELECTRICAL CHARACTERISTICS (V_{IN}=Note1, Io=1.0A, Ta =25°C, unless otherwise specified.)

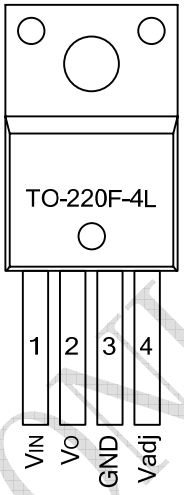
Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	SA378R33	3.22	3.3	3.38	V
		SA378R05	4.88	5	5.12	
		SA378R08	7.8	8	8.2	
		SA378R09	8.78	9	9.22	
		SA378R12	11.7	12	12.3	
		SA378R15	14.6	15	15.4	
		SA378R18	17.55	18	18.45	
Line Regulation	Rline	SA378R33 : Vin=4V to 10V		0.5	2.5	%
		SA378R05 : Vin=6V to 12V				
		SA378R08 : V_{IN} =9V to 25V				
		SA378R09 : Vin=10V to 25V				
		SA378R12 : Vin=13V to 29V				
		SA378R15 : V_{IN} =16V to 30V				
		SA378R18 : Vin=19V to 30V				
Load Regulation	R_{LOAD}	5mA < Io < 3A		0.1	2.0	%
Dropout Voltage	VDROP	I_{OUT}=3A,		0.3	0.5	V
Quiescent Current	IQ	I_O=0A; V_{DIS}=0.4V		3	10	mA
Ripple Rejection	PSRR		45	55		dB
Disable Voltage High	VdisH	Output active	2.0			V
Disable Voltage Low	VdisL	Output disabled			0.8	V
Disable Bias Current High	IdisH	V_{DIS} =2.7V			20	μA
Disable Bias Current Low	IdisL	V_{DIS}=0.4V			-0.4	mA
Reference Voltage	Vref	SA378R00	1.24	1.27	1.30	V

PIN CONFIGURATION

SA378RXXF

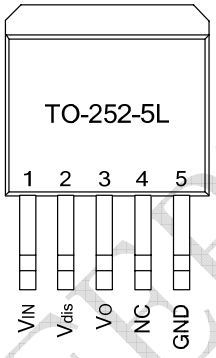


Fixed mode



Adjustable mode

SA378RXXD



Fixed mode

PIN DESCRIPTION

SA378RXXF Fixed mode

Pin No.	Pin name	I/O	Functions
1	VIN	I	Input supply voltage
2	VO	O	Output voltage
3	GND	--	Ground
4	Vdis	I	Disable voltage

SA378RXXFadjustable mode

Pin No.	Pin name	I/O	Functions
1	VIN	I	Input supply voltage
2	VO	O	Output voltage
3	GND	--	Ground
4	Vadj	I	Adjustable voltage

SA378RXXD Fixed mode

Pin No.	Pin name	I/O	Functions
1	VIN	I	Input supply voltage
2	Vdis	I	Disable voltage
3	VO	O	Output voltage
4	NC		Not connect
5	GND	--	Ground

FUNCTION DESCRIPTION

1. Output disable function

The SA378RXX comes with a Vdis pin that allows the regulator to be disabled. Forcing the Vdis pin low disables the regulator .Forcing the Vdis pin high enables the output voltage.

2. Input Capacitor

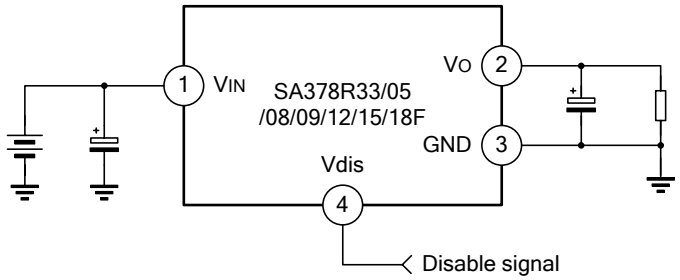
The SA378RXX requires a well-bypassed input capacitor for optimal performance. An input capacitor is required if regulator is located at an appreciable distance from power supply filter.

3. Output Capacitor

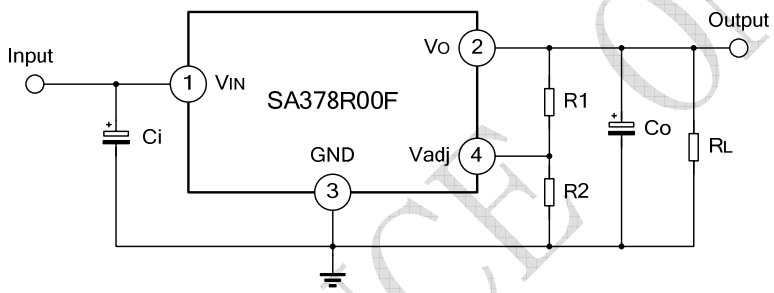
The SA378RXX requires an output capacitor of 47uF or based on the real application to maintain stability.

TYPICAL APPLICATION CIRCUIT

SA378RXXF Fixed mode

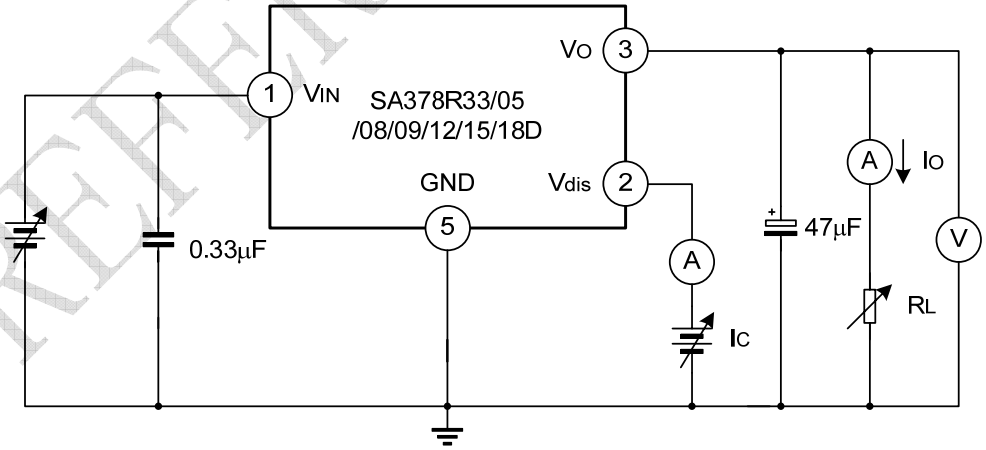


SA378RXXF Adjustable Mode



$$Vo=1.27 \times \frac{R1+R2}{R2}$$

SA378RXXDFixed mode



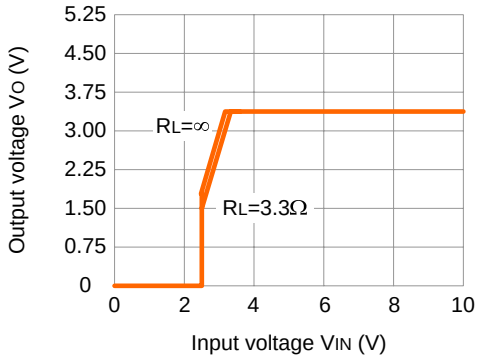
Note:

1. Co =47μF or based on the real application
2. The circuit and parameters are reference only, please set the parameters of the real application circuit based on the real test

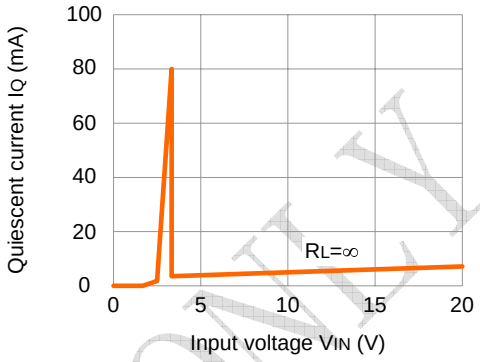
TYPICAL CHARACTERISTICS CURVES

SA378R33

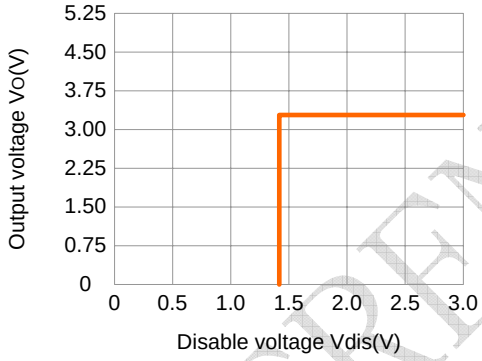
Output voltage vs. input voltage



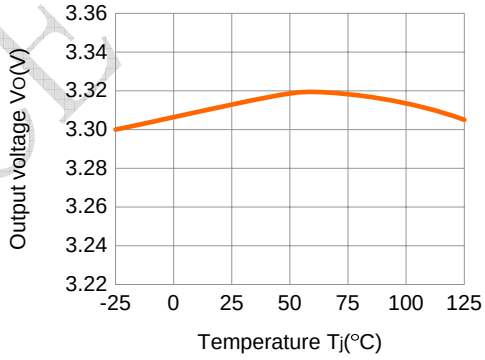
Quiescent current vs. input voltage



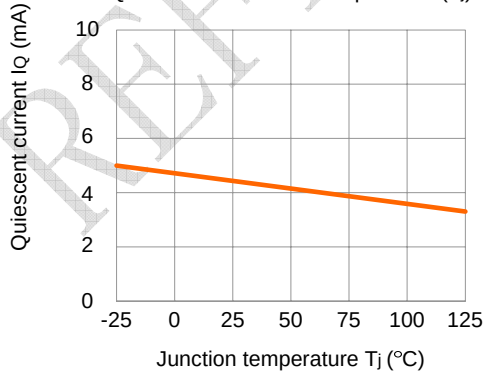
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

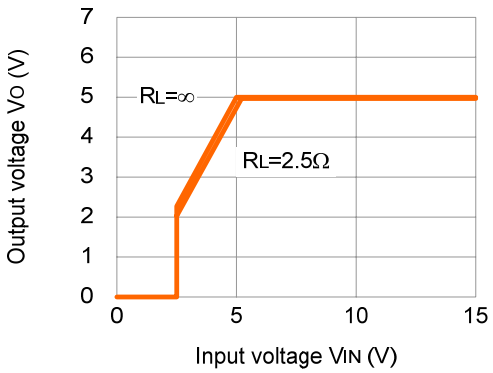


Quiescent current vs. temperature (Tj)

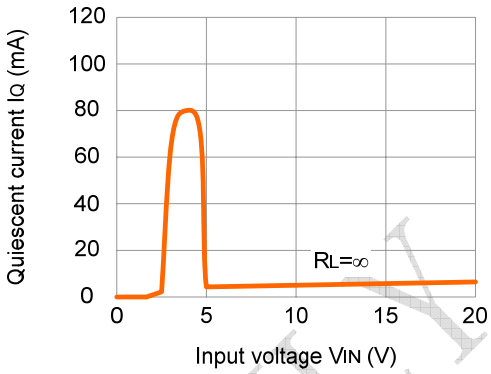


SA378R05

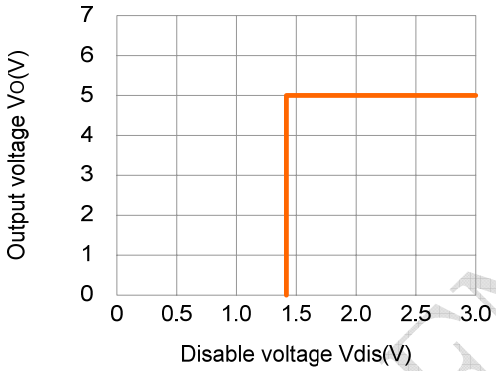
Output voltage vs. input voltage



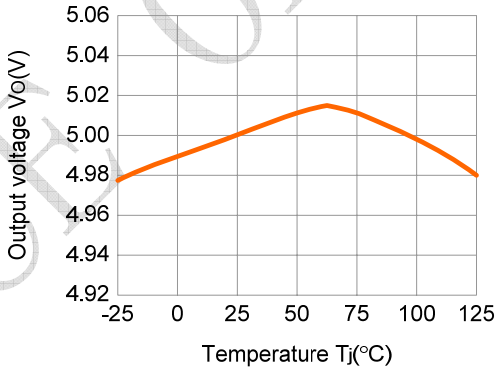
Quiescent current vs. input voltage



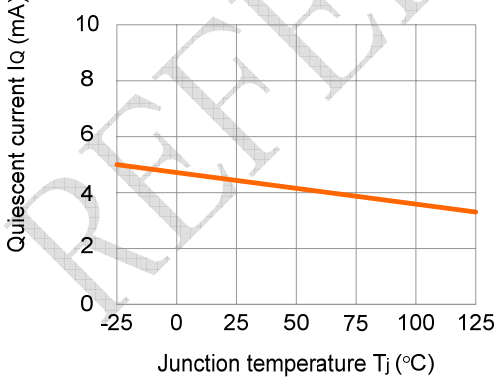
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

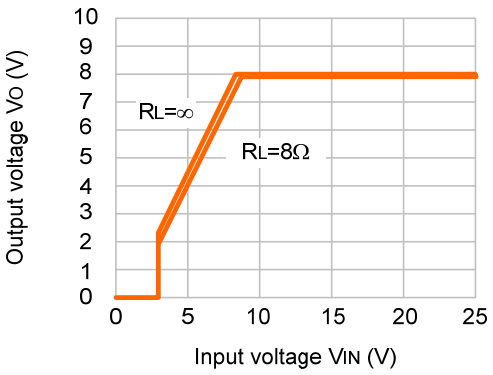


Quiescent current vs. temperature (Tj)

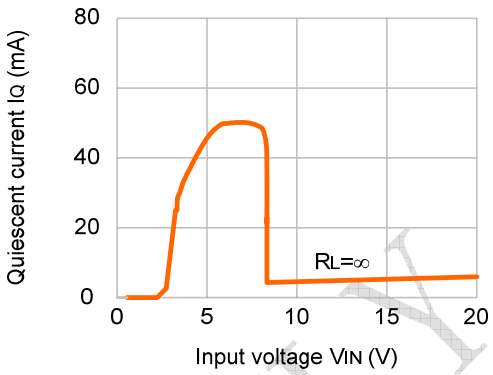


SA378R08

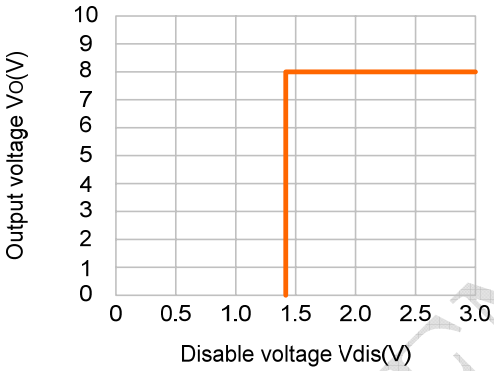
Output voltage vs. input voltage



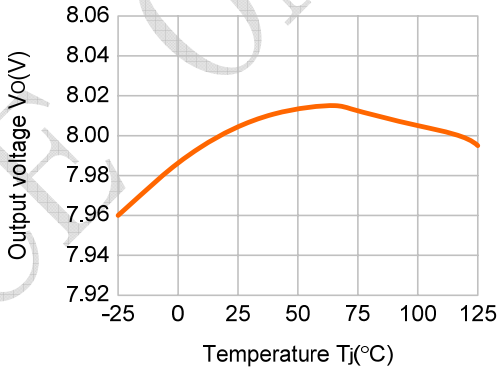
Quiescent current vs. input voltage



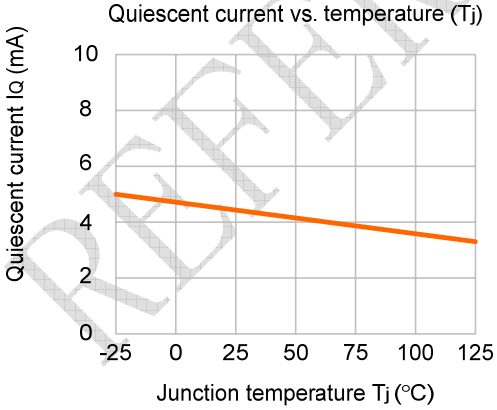
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

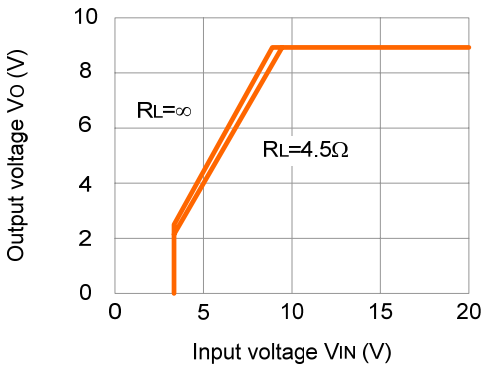


Quiescent current vs. temperature (Tj)

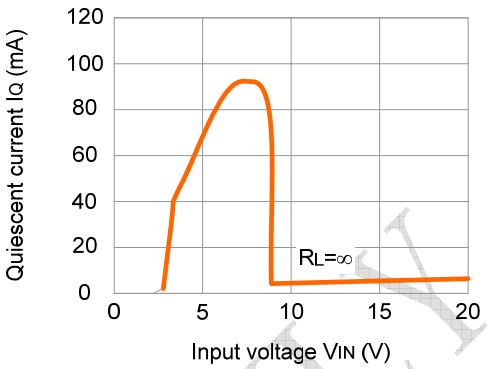


SA378R09

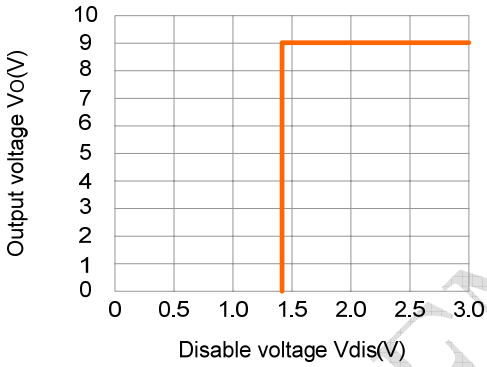
Output voltage vs. input voltage



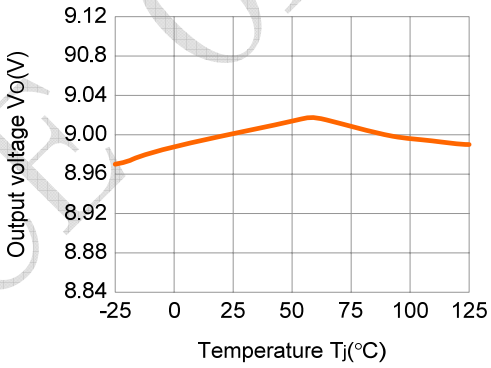
Quiescent current vs. input voltage



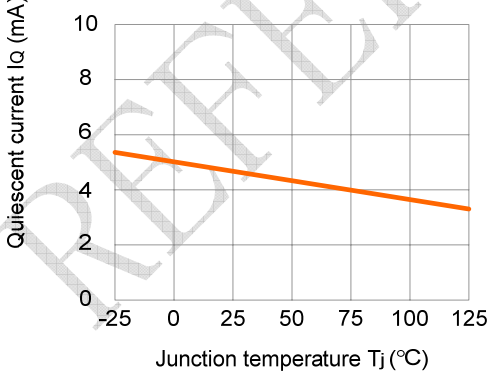
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

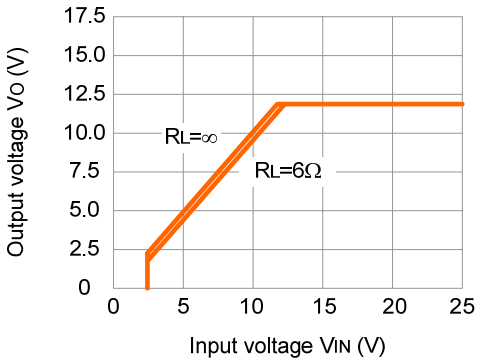


Quiescent current vs. temperature (Tj)

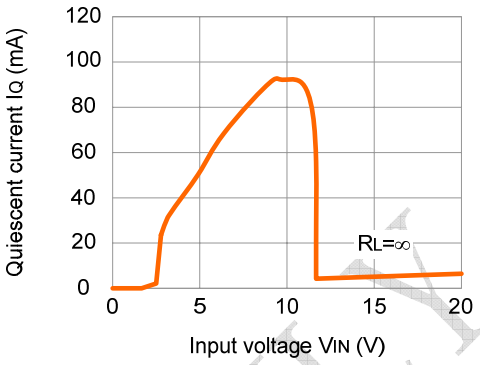


SA378R12

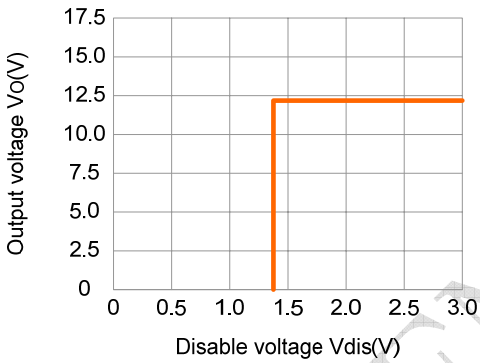
Output voltage vs. input voltage



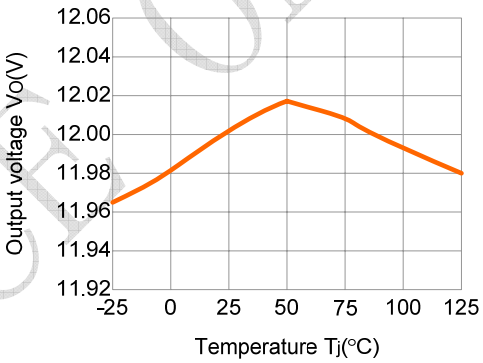
Quiescent current vs. input voltage



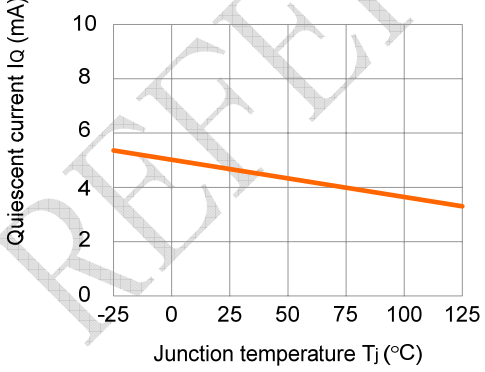
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

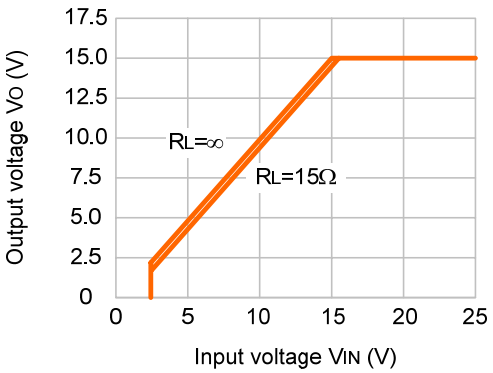


Quiescent current vs. temperature (Tj)

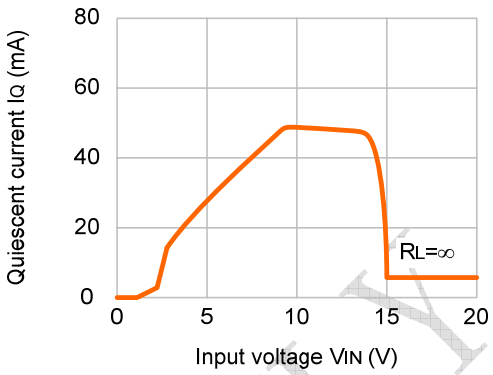


SA378R15

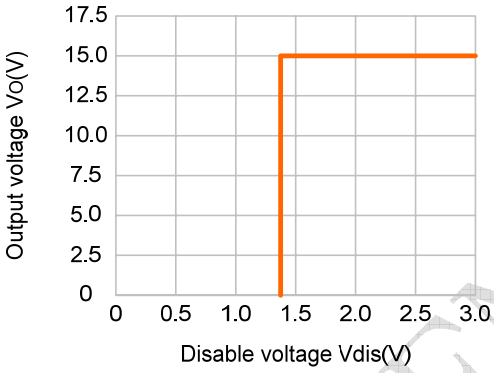
Output voltage vs. input voltage



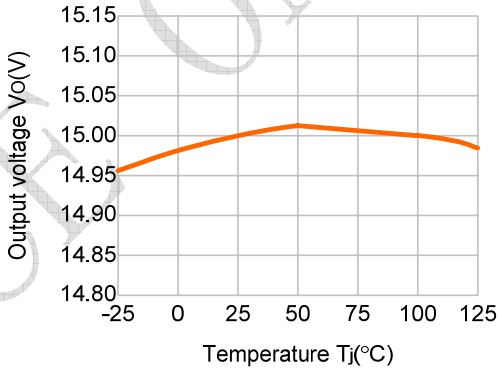
Quiescent current vs. input voltage



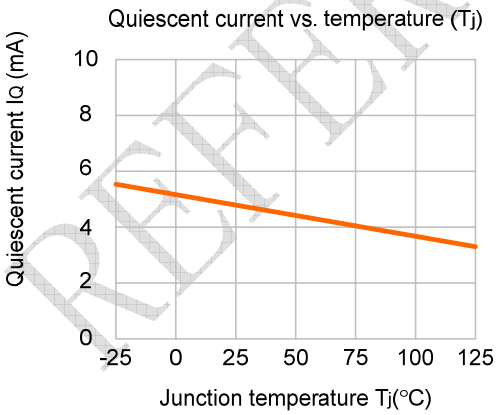
Output voltage vs. disable voltage



Output voltage vs. temperature(Tj)

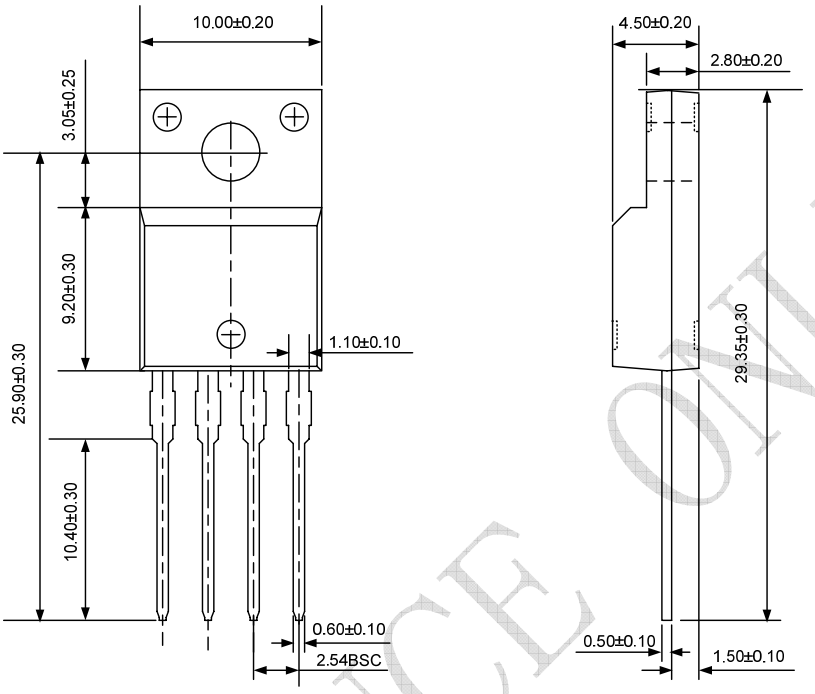


Quiescent current vs. temperature (Tj)

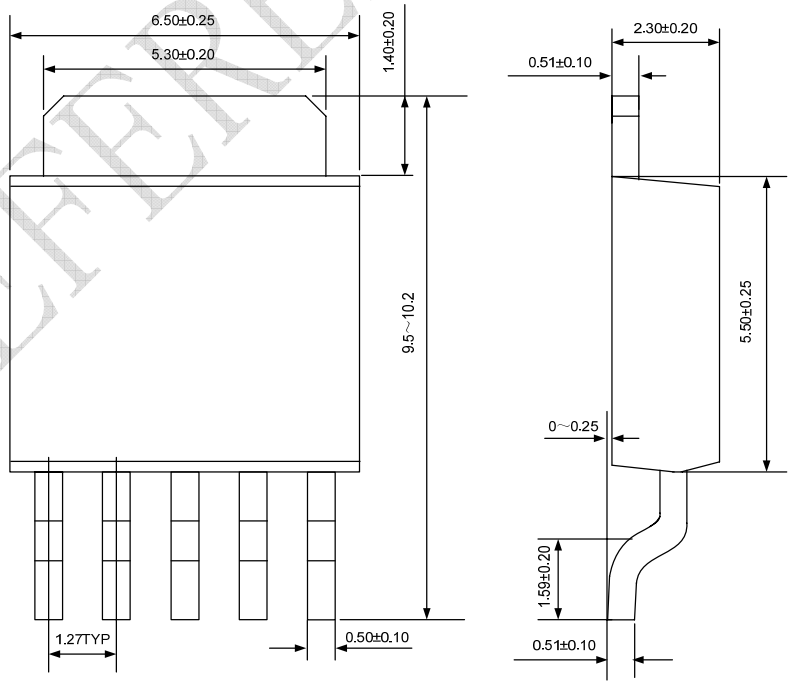


PACKAGE OUTLINE

TO-220F-4L UNIT: mm



TO-252-5L UNIT: mm



Note: Silan reserves the right to make changes without notice in this specification for the improvement of the design and performance. Silan will supply the best possible product for customers.