

2A LDO VOLTAGE REGULATOR

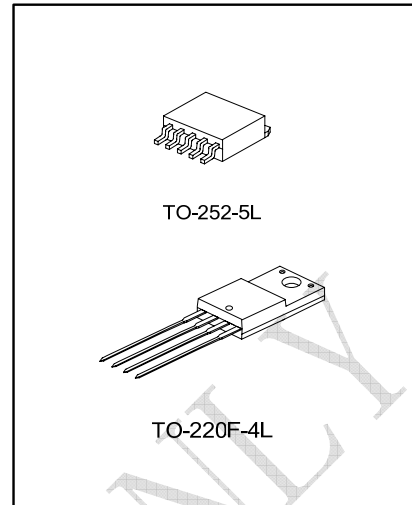
DESCRIPTION

The SA278RXX is a positive low voltage dropout regulator, and voltage dropout is below 0.5V at 2A.

The SA278RXX provides two versions: fixed and adjustable versions. The SA278RXX is available in fixed output voltages 2.5V, 3.3V, 5V, 5.1V, 8V, 9V, 12V, 15V and 18V. The SA278RXX offers some key features include thermal shutdown, peak current protection, overvoltage protection and output disable function. The SA278RXX is an excellent choice for use in various electronic equipments.

FEATURES

- * Available fixed version 2.5V, 3.3V, 5V, 5.1V, 8V, 9V, 12V, 15V, 18V and adjustable version
- * Low Dropout Voltage: 300mV at 2A 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

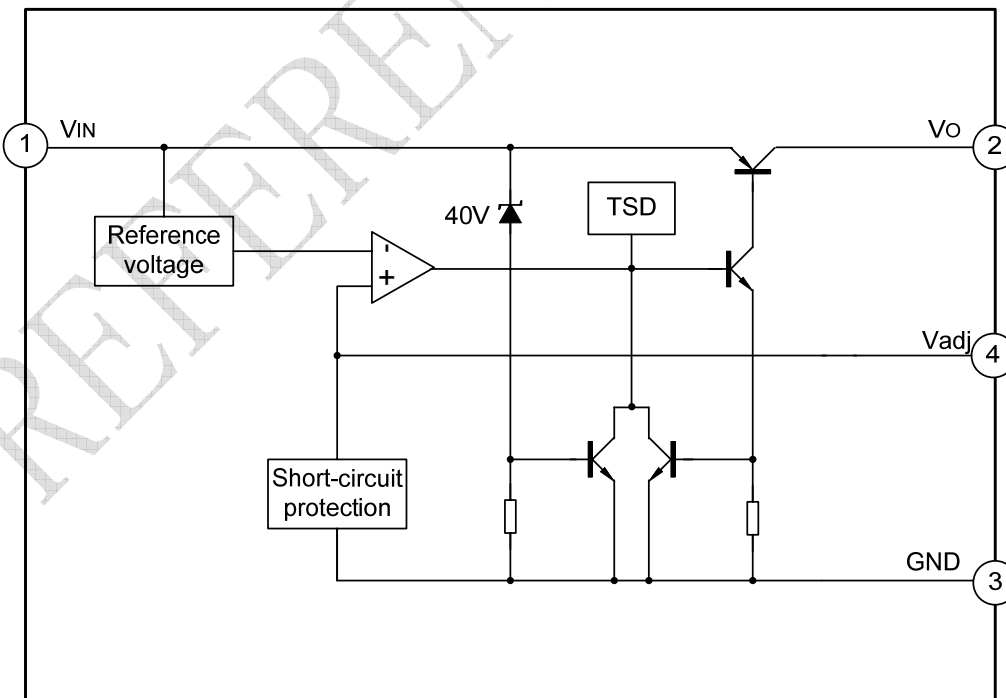
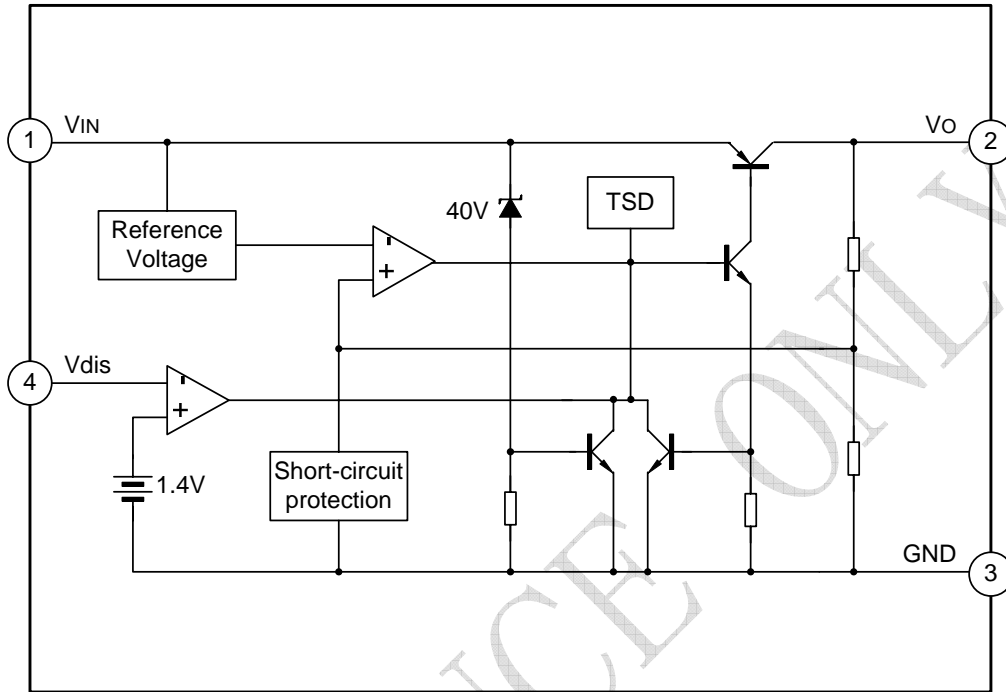
ORDERING INFORMATION (T_{amb}=-20~+80°C)

SA278R	□	□	F/D	
Circuit type				F: Package: TO-220F-4L D: Package: TO-252-5L
	00:	Adjustable output		
	25:	Fixed output 2.5V		
	33:	Fixed output 3.3V		
	05:	Fixed output 5V		
	51:	Fixed output 5.1V		
	08:	Fixed output 8V		
	09:	Fixed output 9V		
	12:	Fixed output 12V		
	15:	Fixed output 15V		
	18:	Fixed output 18V		

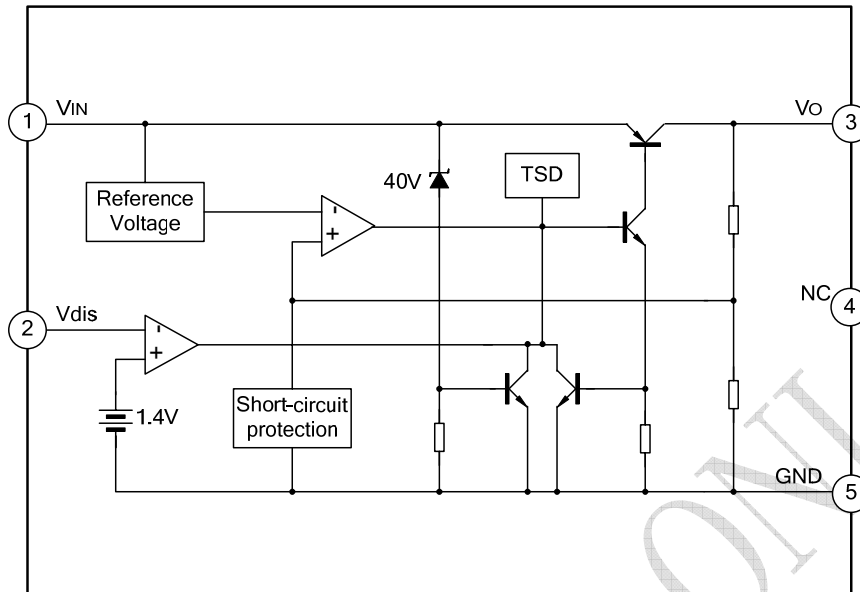
Part No.	Package	marking	Packing Type
SA278R00F	TO-220F-4L	SA278R00F	Stick
SA278R25F		SA278R25F	Stick
SA278R33F		SA278R33F	Stick
SA278R05F		SA278R05F	Stick
SA278R51F		SA278R51F	Stick
SA278R08F		SA278R08F	Stick
SA278R09F		SA278R09F	Stick
SA278R12F		SA278R12F	Stick
SA278R15F		SA278R15F	Stick
SA278R18F		SA278R18F	Stick
SA278R25DTR		TO-252-5L	SA278R25D
SA278R33DTR	SA278R33D		Tape & Reel
SA278R05DTR	SA278R05D		Tape & Reel
SA278R51DTR	SA278R51D		Tape & Reel
SA278R08DTR	SA278R08D		Tape & Reel
SA278R09DTR	SA278R09D		Tape & Reel
SA278R12DTR	SA278R12D		Tape & Reel
SA278R15DTR	SA278R15D		Tape & Reel
SA278R18DTR	SA278R18D		Tape & Reel
SA278R25D	TO-252-5L	SA278R25D	Stick
SA278R33D		SA278R33D	Stick
SA278R05D		SA278R05D	Stick
SA278R51D		SA278R51D	Stick
SA278R08D		SA278R08D	Stick
SA278R09D		SA278R09D	Stick
SA278R12D		SA278R12D	Stick
SA278R15D		SA278R15D	Stick
SA278R18D		SA278R18D	Stick

BLOCK DIAGRAM

SA278RXXF



SA278RXXD



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	2.0	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	T_{opr}	-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

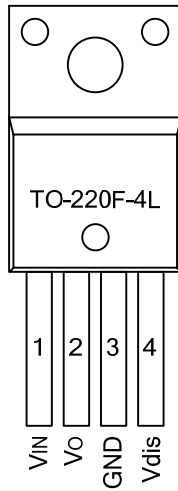
Characteristics	Symbol	Ratings	Unit	
Input Voltage	V_{IN}	SA278R25	3.3	V
		SA278R33	5	
		SA278R05	7	
		SA278R51	7	
		SA278R08	10	
		SA278R09	11	
		SA278R12	15	
		SA278R15	20	
SA278R18	21			
Operating Junction Temperature Range	T_j	-20~+80	°C	

ELECTRICAL CHARACTERISTICS (VIN=Note1, Io=1.0A, Ta =25°C, unless otherwise specified.)

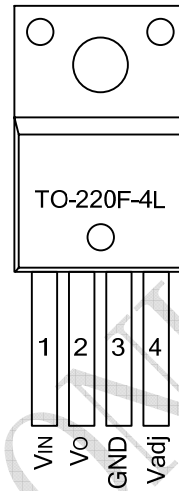
Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	VOUT	SA278R25	2.44	2.5	2.56	V
		SA278R33	3.22	3.3	3.38	
		SA278R05	4.88	5	5.12	
		SA278R51	4.98	5.1	5.22	
		SA278R08	7.8	8	8.2	
		SA278R09	8.78	9	9.22	
		SA278R12	11.7	12	12.3	
		SA278R15	14.6	15	15.4	
		SA278R18	17.55	18	18.45	
Line Regulation	Rline	SA278R25 : Vin=4V to 10V		0.5	2.5	%
		SA278R33 : Vin=4V to 10V				
		SA278R05 : Vin=6V to 12V				
		SA278R51 : Vin=6V to 12V				
		SA278R08 : Vin =9V to 25V				
		SA278R09 : Vin=10V to 25V				
		SA278R12 : Vin=13V to 29V				
		SA278R15 : VIN =16V to 30V				
SA278R18 : Vin=19V to 30V						
Load Regulation	R _{LOAD}	5mA < Io < 2A		0.1	2.0	%
Dropout Voltage	V _{DROP}	I _{OUT} =2A,		0.3	0.5	V
Quiescent Current	I _Q	I _O =0A; V _{DIS} =0.4V		3	10	mA
Ripple Rejection	PSRR		45	55		dB
Disable Voltage High	V _{disH}	Output active	2.0			V
Disable Voltage Low	V _{disL}	Output disabled			0.8	V
Disable Bias Current High	I _{disH}	V _{DIS} =2.7V			20	μA
Disable Bias Current Low	I _{disL}	V _{DIS} =0.4V			-0.4	mA
Reference Voltage	V _{ref}	SA278R00	1.24	1.27	1.30	V

PIN CONFIGURATION

SA278RXXF

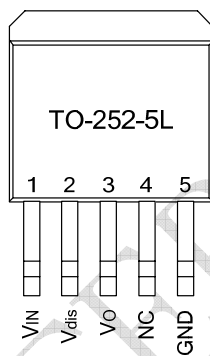


Fixed mode



Adjustable mode

SA278RXXD



Fixed mode

PIN DESCRIPTION
SA278RXXF 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

SA278RXXF adjustable 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

SA278RXXD Fixed mode

SA278RXXD	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 SA278RXX 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

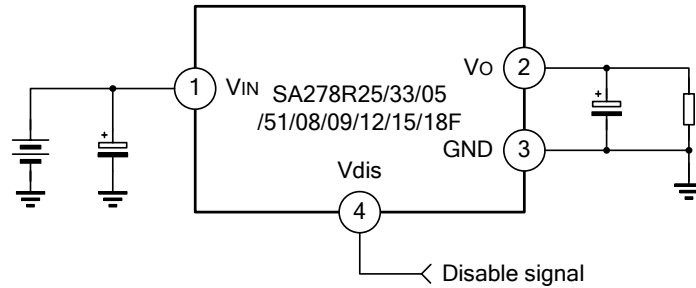
The SA278RXX requires a well-bypassed input capacitor for optimal performance. An input capacitor is required if regulator is located at an appreciable distance from power supply filter.

3. Output Capacitor

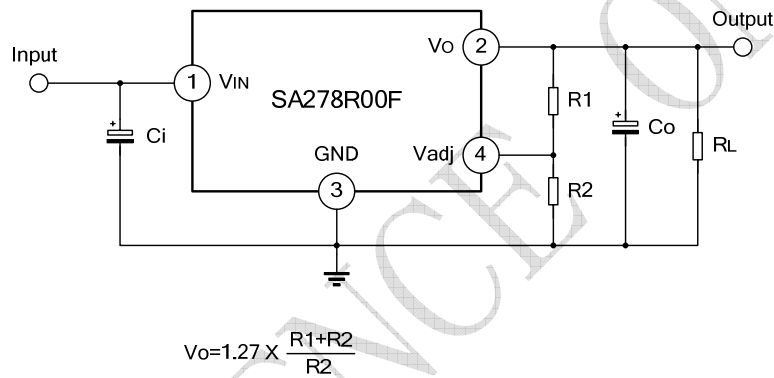
The SA278RXX requires an output capacitor of 47uF or based on the real application to maintain stability.

TYPICAL APPLICATION CIRCUIT

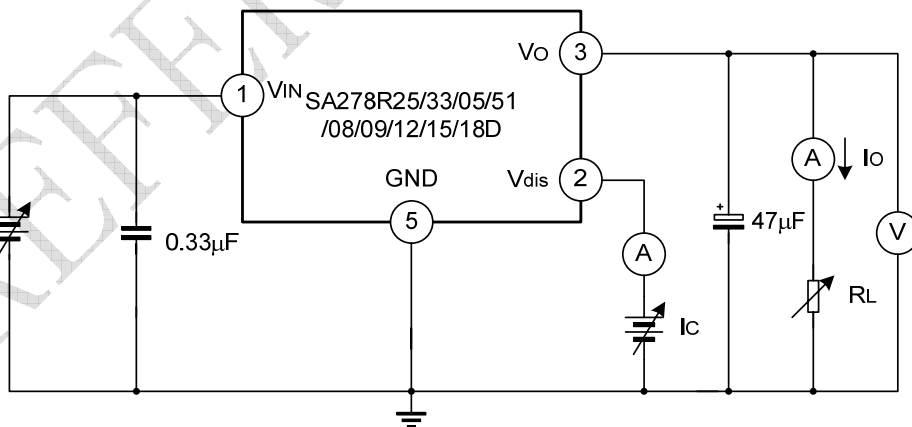
SA278RXXF Fixed mode



SA278RXXF Adjustable Mode



SA278RXXDFixed mode

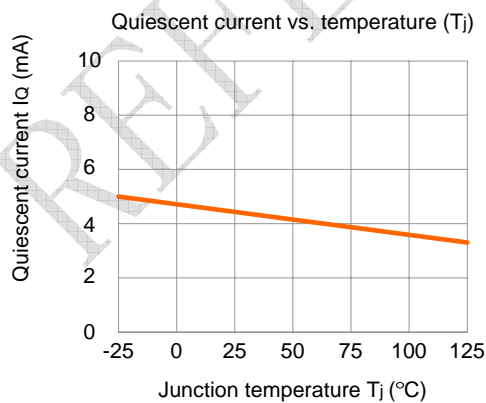
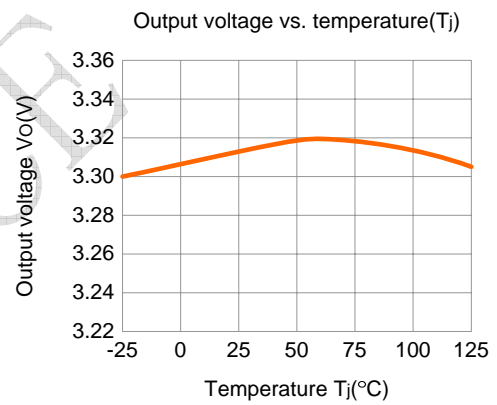
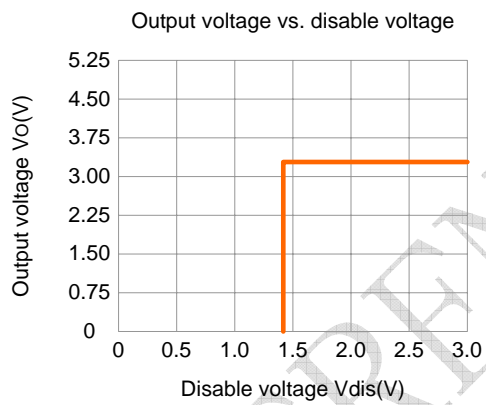
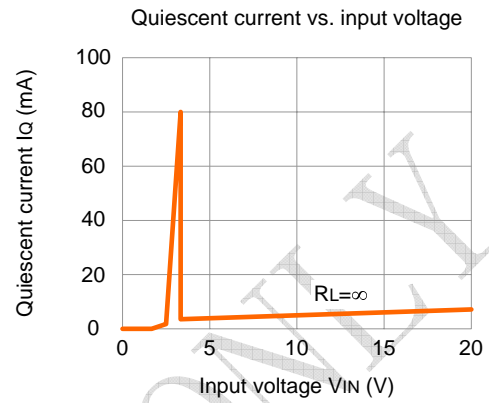
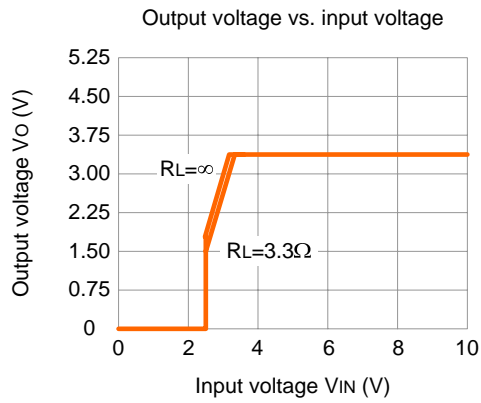


Note:

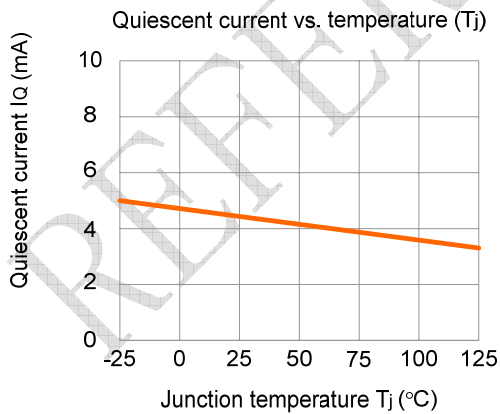
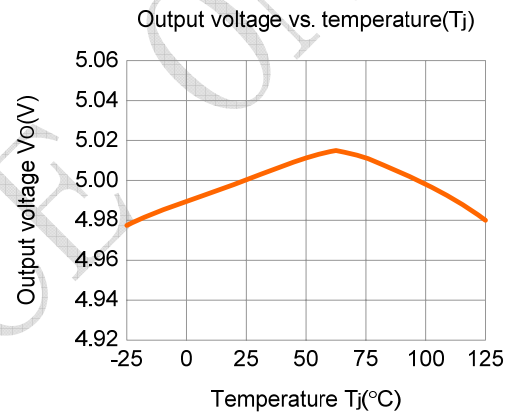
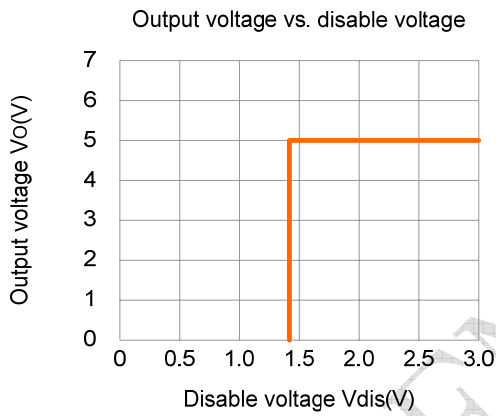
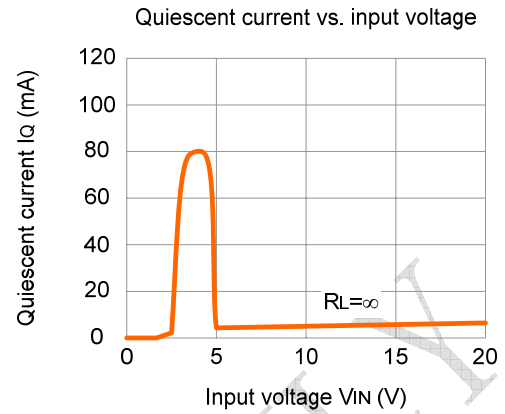
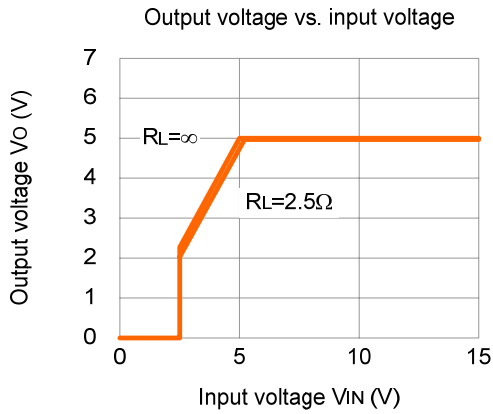
1. Co = 47µF or based on the real application
2. The circuit and parameters are reference only, please set the parameters of the real application circuit based on the real test

TYPICAL CHARACTERISTICS CURVES

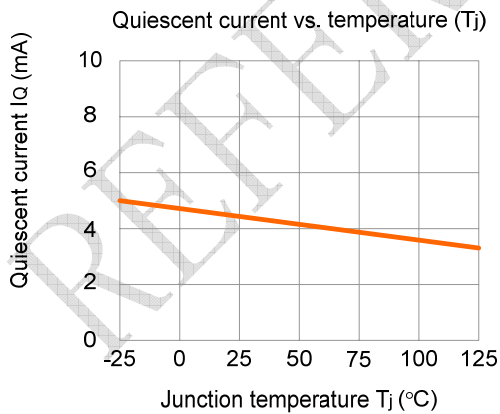
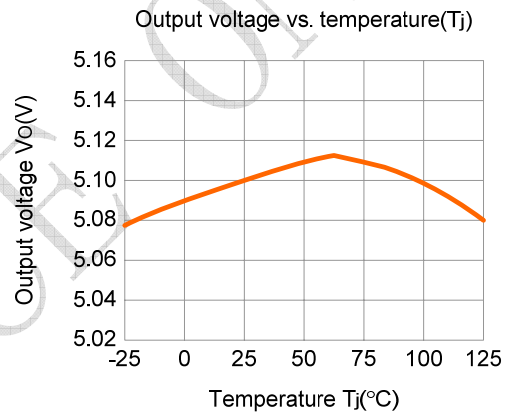
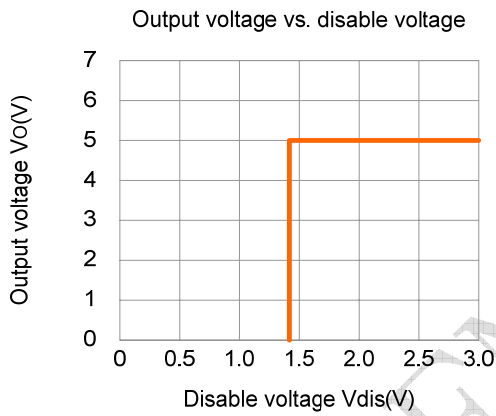
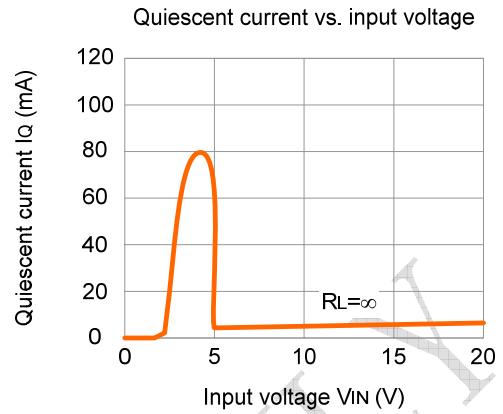
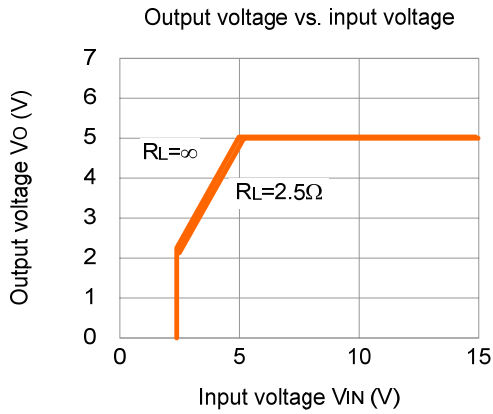
SA278R33



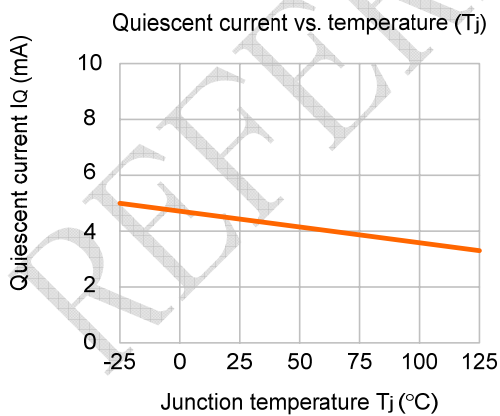
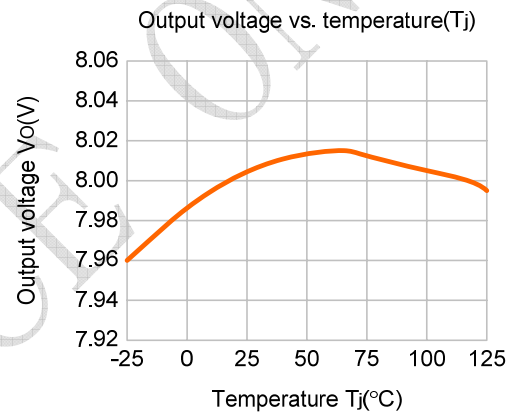
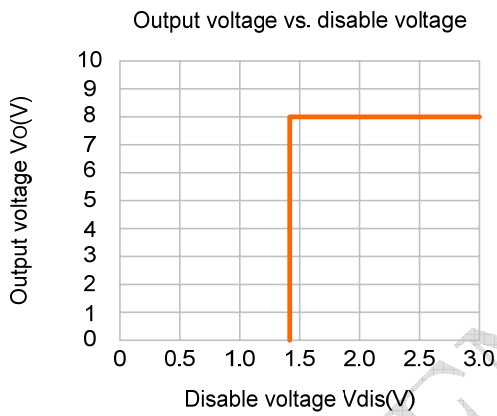
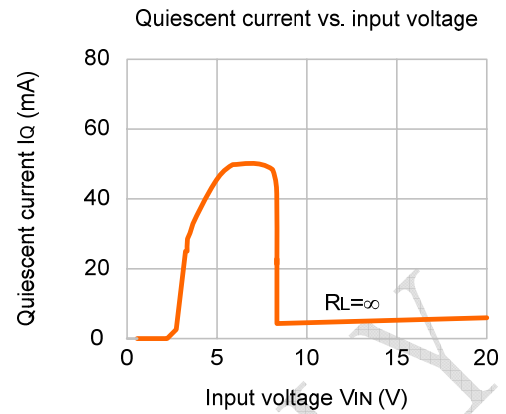
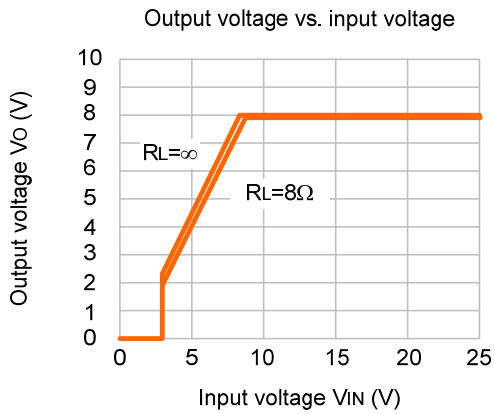
SA278R05



SA278R51

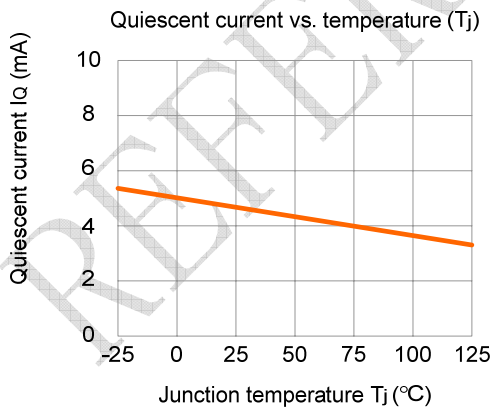
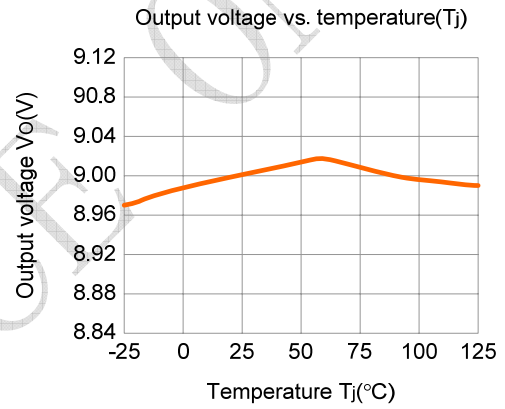
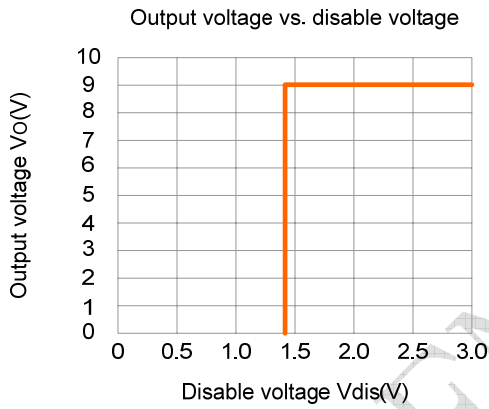
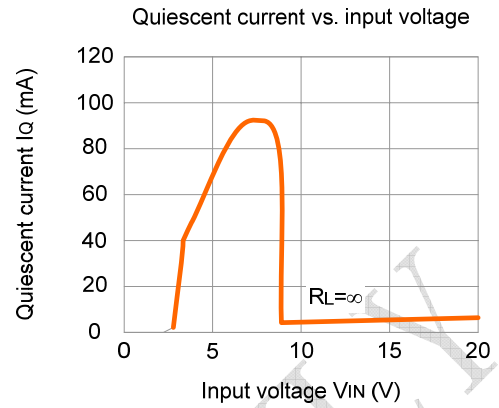
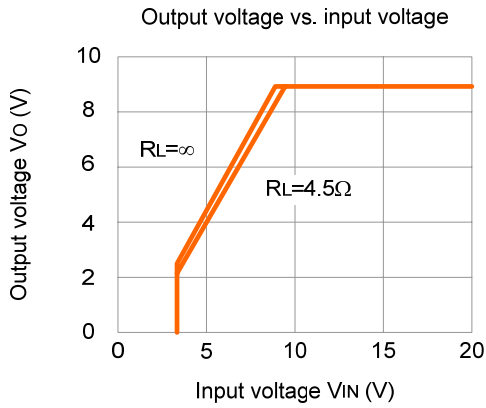


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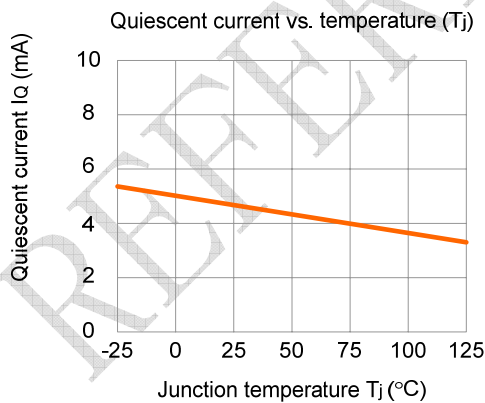
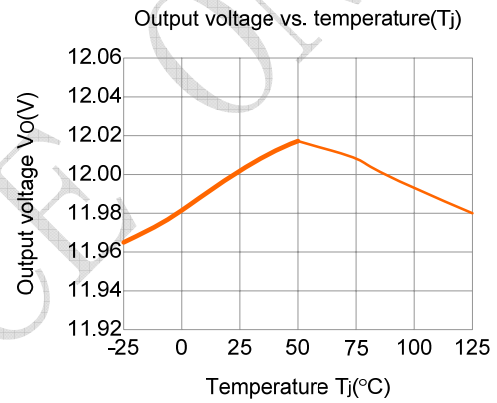
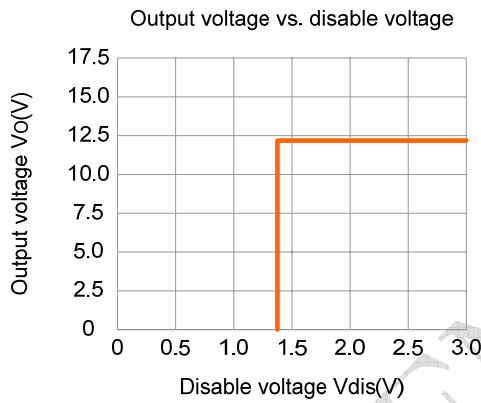
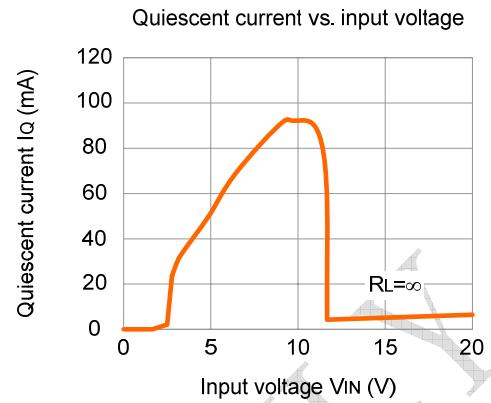
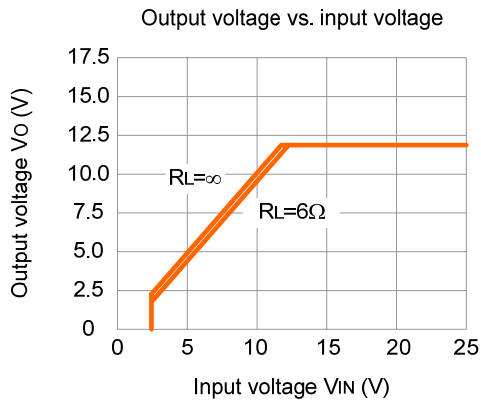




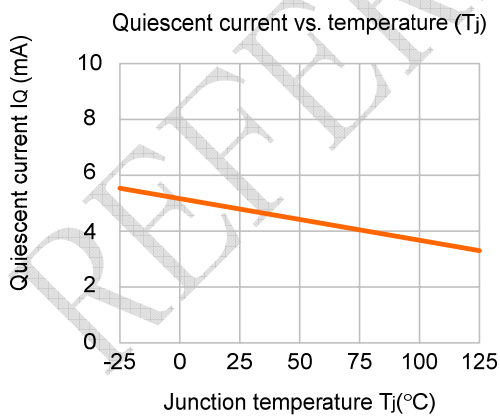
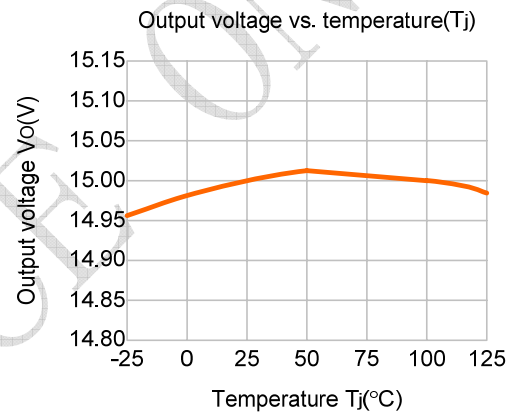
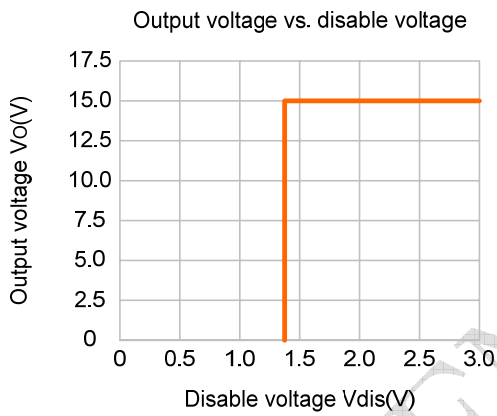
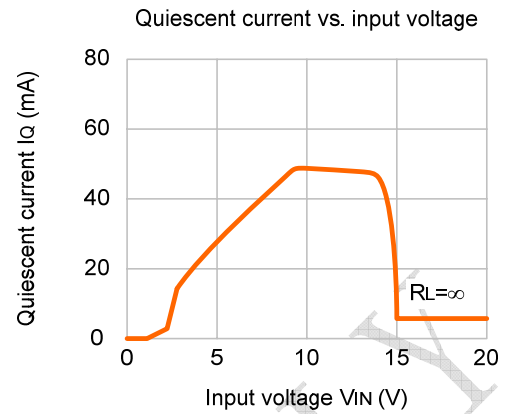
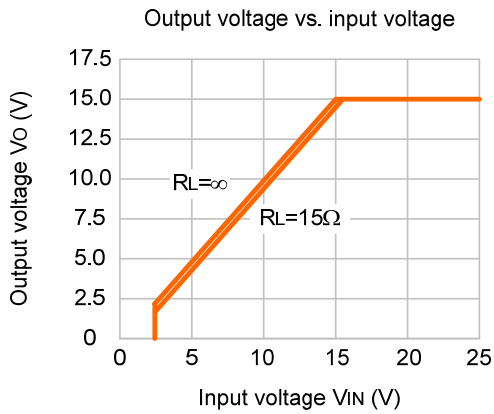
SA278R09



SA278R12



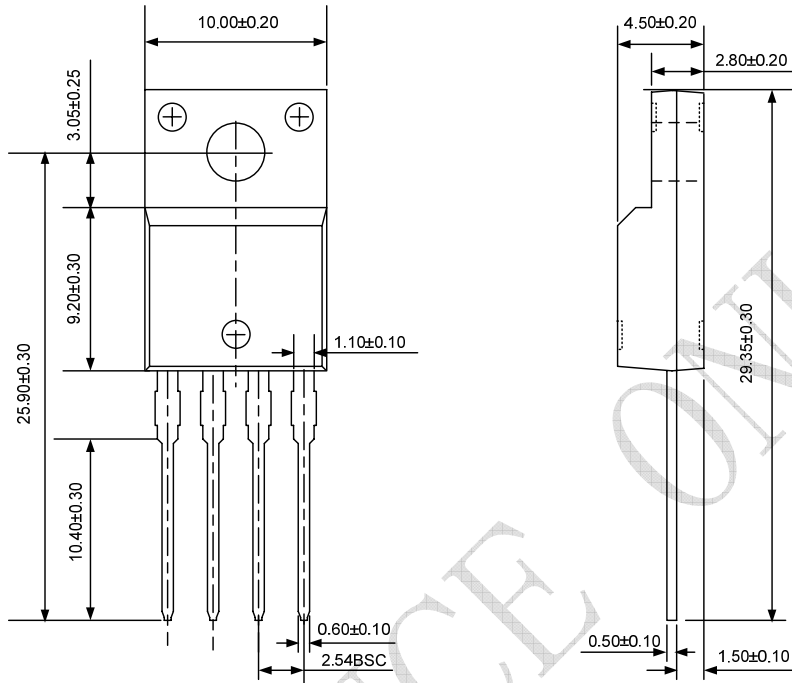
SA278R15



PACKAGE OUTLINE

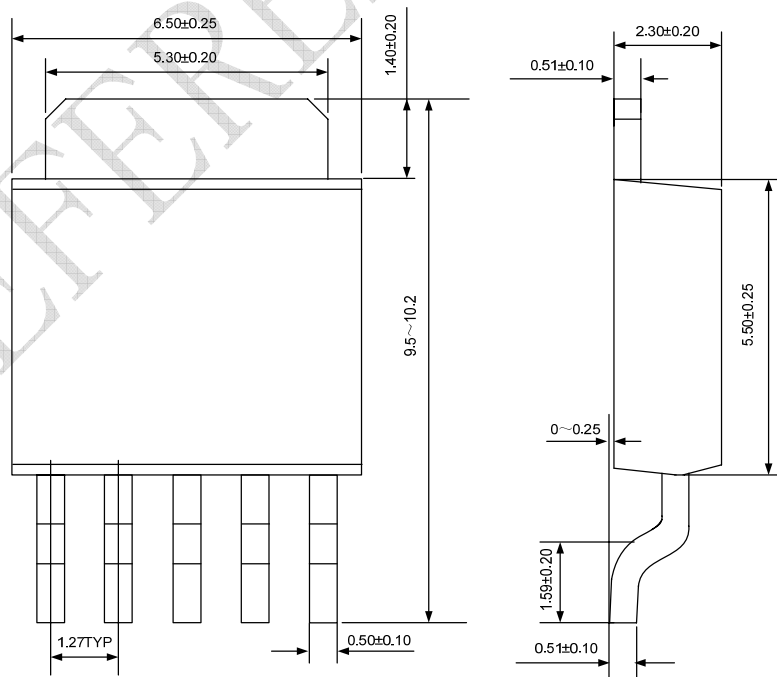
TO-220F-4L

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.