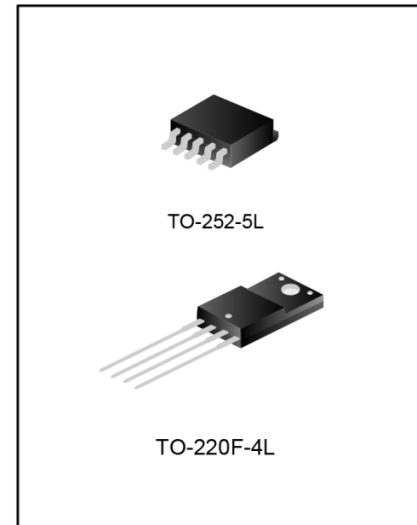


2A Low Dropout Voltage Regulator

General Description

The GGA278RXX is a positive voltage regulator with low dropout voltage below 0.5V at 2A.

The GGA278RXX provides two versions: fixed and adjustable versions. The GGA278RXX is available in fixed output voltages 3.3V, 5V, 8V, 9V, 12V, 15V and 18V. The GGA278RXX offers some key features including thermal shutdown, peak current protection, overvoltage protection and output disable function. The GGA278RXX is an excellent device for use in various electronic equipment.



Features

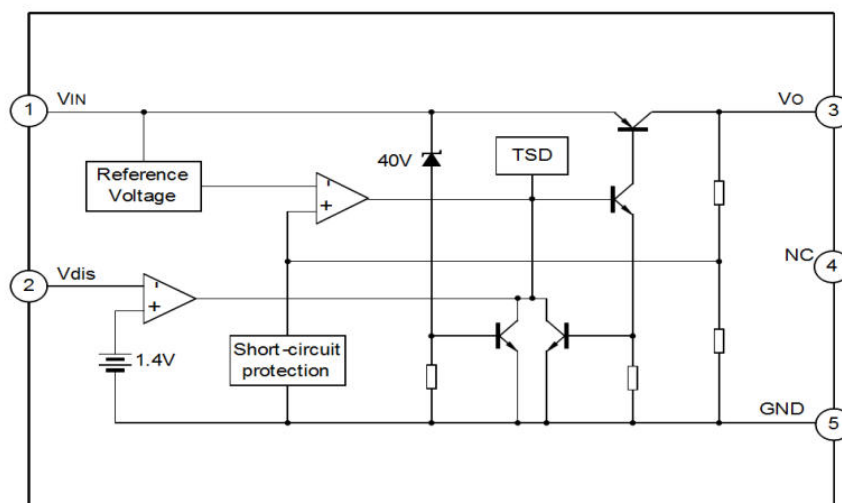
- Available fixed version 3.3V, 5V, 8V, 9V, 12V, 15V, 18V and adjustable version
- Low Dropout Voltage: 300mV at 2A output current
- Current limiting: 4A
- Overvoltage protection: 40V
- Built-in output disable function
- TO-220 full-mold package (4pin) and TO-252-5L package (5pin)
- Overcurrent protection, 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

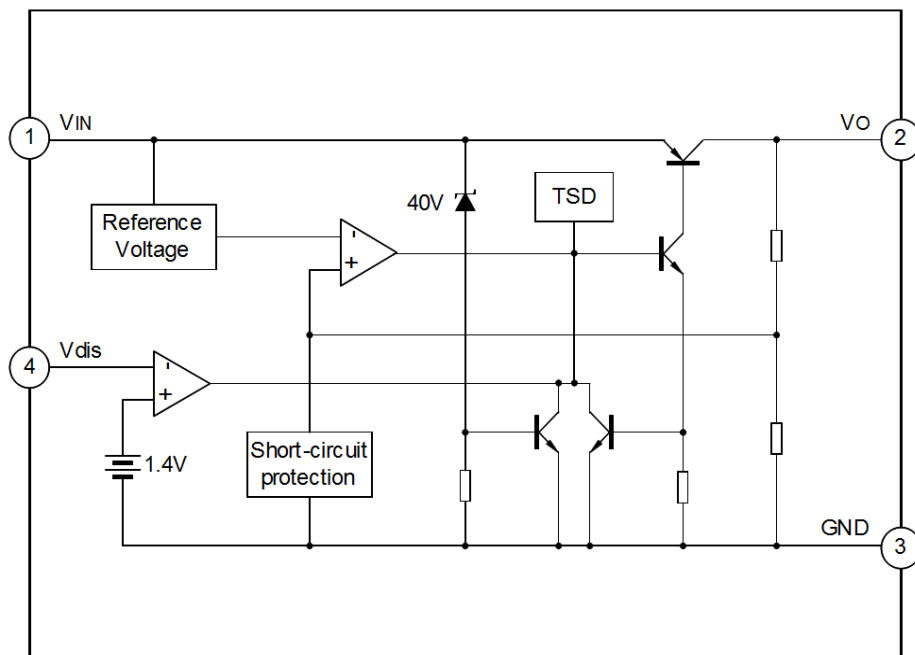
Block Diagram

GGA278RXXD

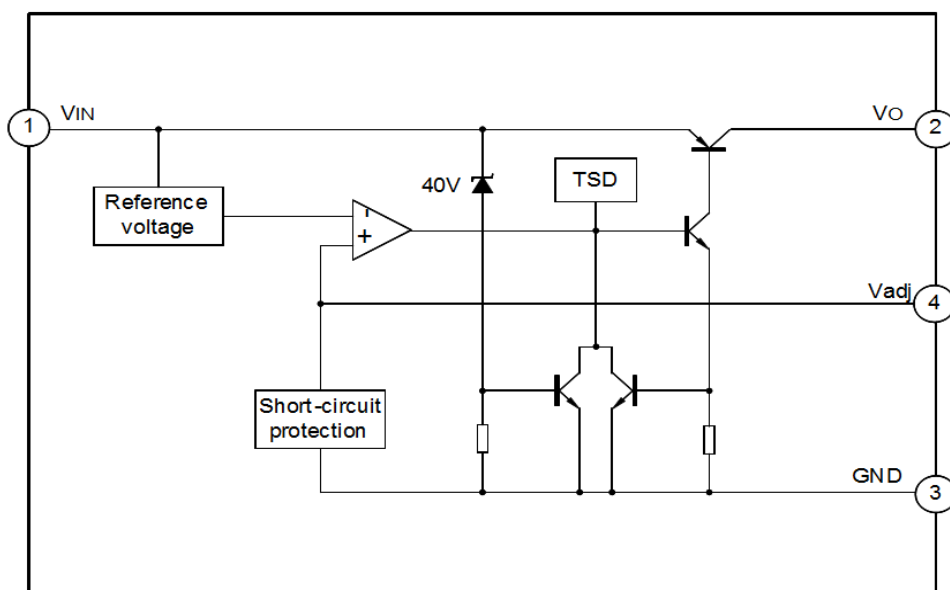


Fixed Mode

GGA278RXXF



Fixed Mode



Adjustable Mode

Absolute Maximum Ratings (Operating Temperature Range Applies Unless Otherwise Specified)

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
Operating Junction Temperature	T _J	150	°C
Operating Temperature Range	T _{opr}	-20~+85	°C
Thermal Resistance, Junction-To Case	R _{θjc}	2.9	°C/W
Thermal Resistance, Junction-To Air	R _{θja}	48.51	°C/W

Recommended Operating Conditions

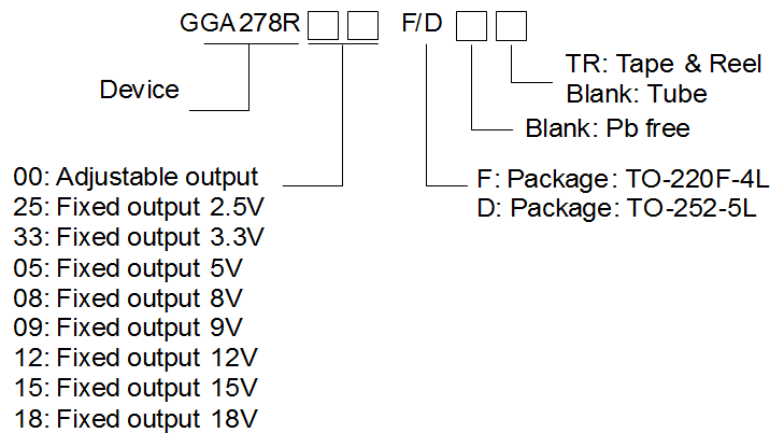
Characteristics	Symbol	Ratings		Unit
Input Voltage	V _{IN}	GGA278R25	3.3	V
		GGA278R33	5	
		GGA278R05	7	
		GGA278R08	10	
		GGA278R09	11	
		GGA278R12	15	
		GGA278R15	20	
		GGA278R18	21	
Operating Junction Temperature Range	T _j	-20~+80		°C

Electrical Characteristics (V_{IN}=Note1, I_o=1.0A, T_a =25°C, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V _{OUT}	GGA278R25	2.44	2.5	2.56	V
		GGA278R33	3.22	3.3	3.38	
		GGA278R05	4.88	5	5.12	
		GGA278R08	7.8	8	8.2	
		GGA278R09	8.78	9	9.22	
		GGA278R12	11.7	12	12.3	
		GGA278R15	14.6	15	15.4	
		GGA278R18	17.55	18	18.45	
Line Regulation	R _{line}	GGA278R25 : V _{in} =4V to 10V		0.5	2.5	%
		GGA278R33 : V _{in} =4V to 10V				
		GGA278R05 : V _{in} =6V to 12V				
		GGA278R08 : V _{in} =9V to 25V				
		GGA278R09 : V _{in} =10V to 25V				
		GGA278R12 : V _{in} =13V to 29V				

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
		GGA278R15 : $V_{IN} = 16V$ to $30V$				
		GGA278R18 : $V_{IN} = 19V$ to $30V$				
Load Regulation	R_{LOAD}	$5mA < I_O < 2A$		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}	GGA278R00	1.24	1.27	1.30	V

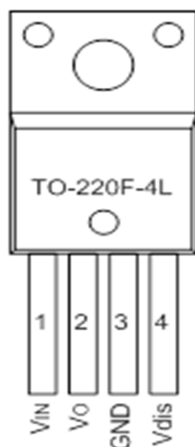
Ordering Information (Temperature range: -40°C ~125°C)



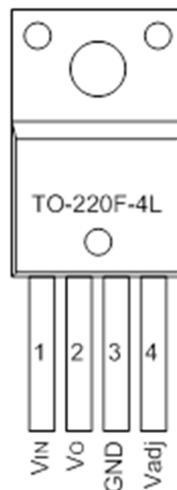
Part No.	Package	Marking	Material	Packing Type
GGA278R00F	TO-220F-4L	GGA278R00F	Pb free	Tube
GGA278R25F		GGA278R25F	Pb free	Tube
GGA278R33F		GGA278R33F	Pb free	Tube
GGA278R05F		GGA278R05F	Pb free	Tube
GGA278R51F		GGA278R51F	Pb free	Tube
GGA278R08F		GGA278R08F	Pb free	Tube
GGA278R09F		GGA278R09F	Pb free	Tube
GGA278R12F		GGA278R12F	Pb free	Tube
GGA278R15F		GGA278R15F	Pb free	Tube
GGA278R18F		GGA278R18F	Pb free	Tube
GGA278R25DTR	TO-252-5L	GGA278R25D	Pb free	Tape & Reel
GGA278R33DTR		GGA278R33D	Pb free	Tape & Reel
GGA278R05DTR		GGA278R05D	Pb free	Tape & Reel
GGA278R51DTR		GGA278R51D	Pb free	Tape & Reel
GGA278R08DTR		GGA278R08D	Pb free	Tape & Reel
GGA278R09DTR		GGA278R09D	Pb free	Tape & Reel
GGA278R12DTR		GGA278R12D	Pb free	Tape & Reel
GGA278R15DTR		GGA278R15D	Pb free	Tape & Reel
GGA278R18DTR		GGA278R18D	Pb free	Tape & Reel
GGA278R25D	TO-252-5L	GGA278R25D	Pb free	Tube
GGA278R33D		GGA278R33D	Pb free	Tube
GGA278R05D		GGA278R05D	Pb free	Tube
GGA278R51D		GGA278R51D	Pb free	Tube
GGA278R08D		GGA278R08D	Pb free	Tube
GGA278R09D		GGA278R09D	Pb free	Tube
GGA278R12D		GGA278R12D	Pb free	Tube
GGA278R15D		GGA278R15D	Pb free	Tube
GGA278R18D		GGA278R18D	Pb free	Tube

Pin Description

GGA278RXXF

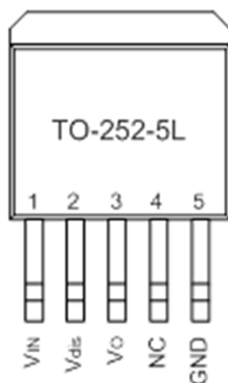


Fixed mode



Adjustable mode

GGA278RXXD



GGA278RXXF Fixed mode

Pin No.	Pin name	I/O	Functions
1	V _{IN}	I	Input supply voltage
2	V _O	O	Output voltage
3	GND	--	Ground
4	V _{dis}	I	Disable voltage

GGA278RXXF Adjustable mode

Pin No.	Pin name	I/O	Functions
1	V _{IN}	I	Input supply voltage
2	V _O	O	Output voltage
3	GND	--	Ground
4	V _{adj}	I	Adjustable voltage

GGA278RXXD Fixed mode

Pin No.	Pin name	I/O	Functions
1	V _{IN}	I	Input supply voltage
2	V _{dis}	I	Disable voltage
3	V _O	O	Output voltage
4	NC		Not connect
5	GND	--	Ground

Function Description

Output disable function

The GGA278RXX comes with a V_{dis} pin that allows the regulator to be disabled. Forcing the V_{dis} pin low disables the regulator. Forcing the V_{dis} pin high enables the output voltage.

1. Input Capacitor

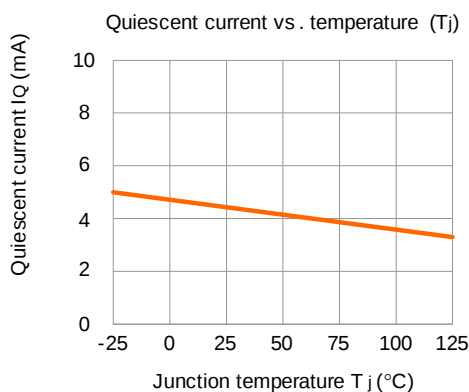
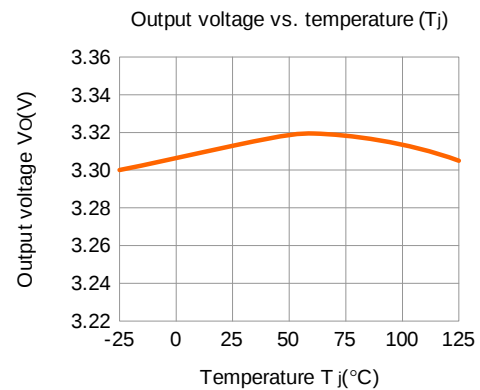
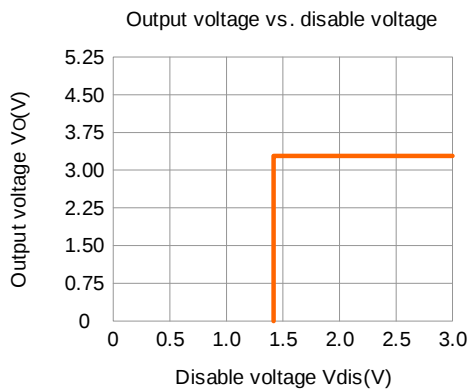
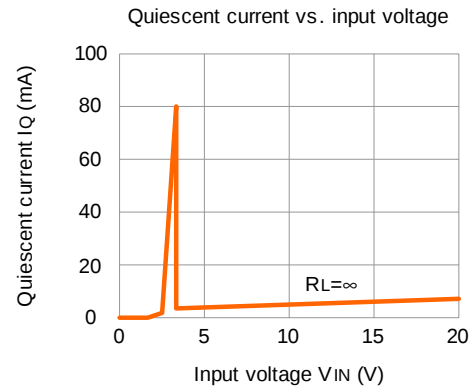
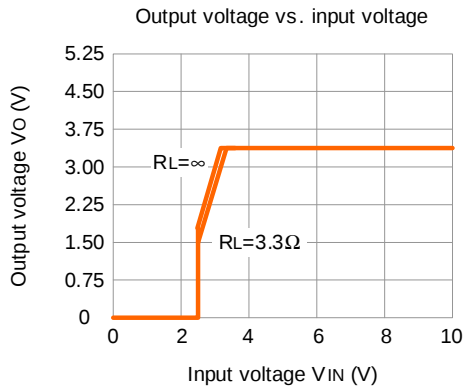
The GGA278RXX requires a well-bypassed input capacitor for optimal performance. An input capacitor is required if regulator is located at an appreciable distance from power supply filter.

2. Output Capacitor

The GGA278RXX requires an output capacitor of 47 μ F (or based on the real application) to maintain stability.

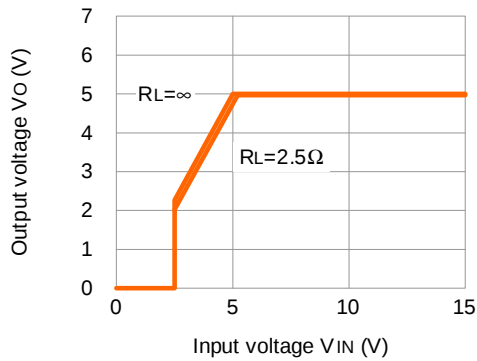
Typical Characteristics

GGA278R33

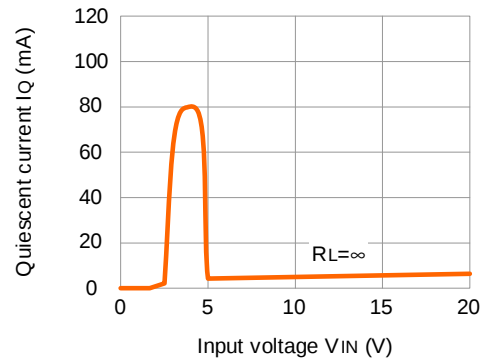


GGA278R05

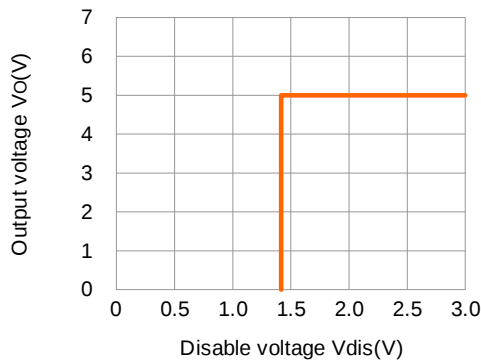
Output voltage vs. input voltage



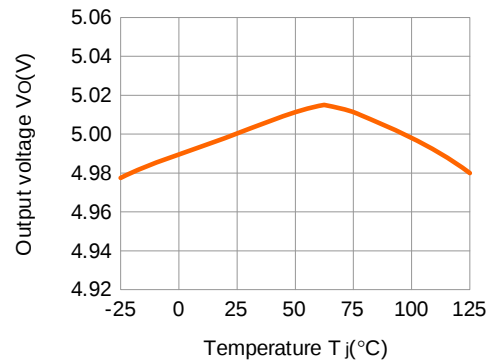
Quiescent current vs. input voltage



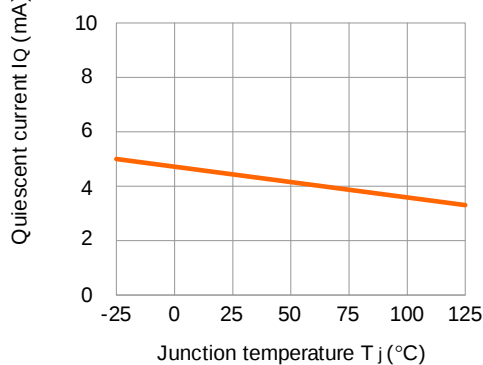
Output voltage vs. disable voltage



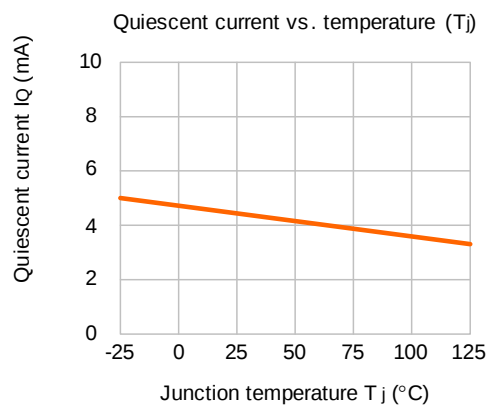
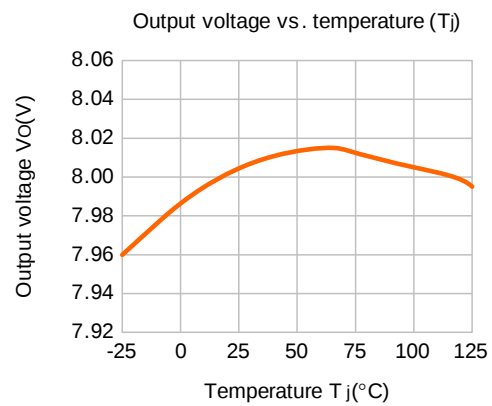
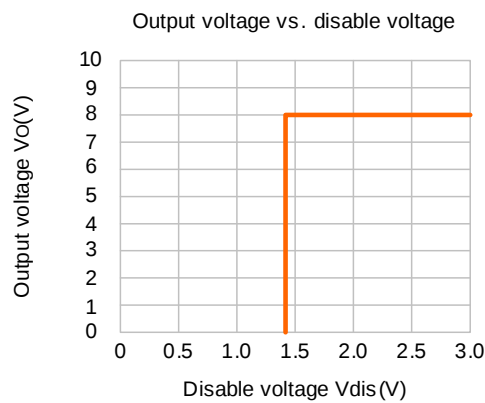
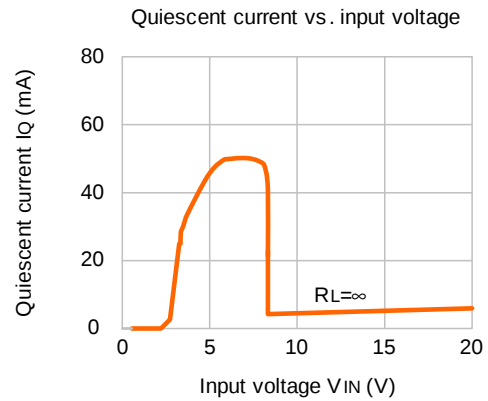
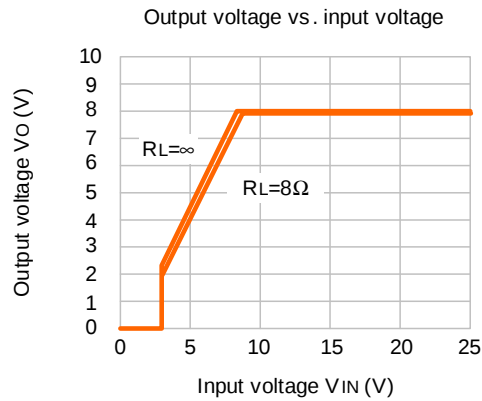
Output voltage vs. temperature (T_j)



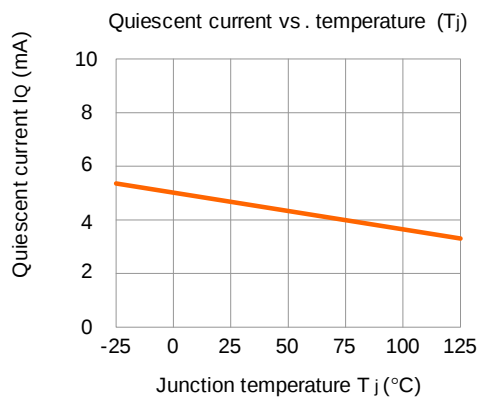
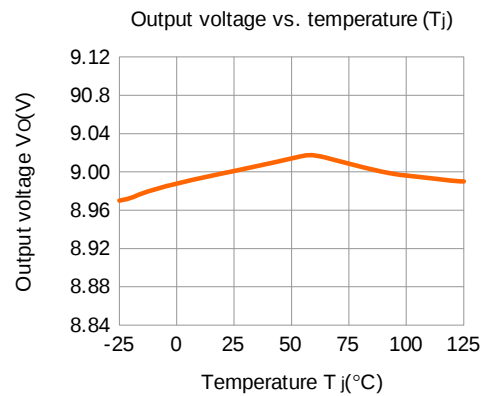
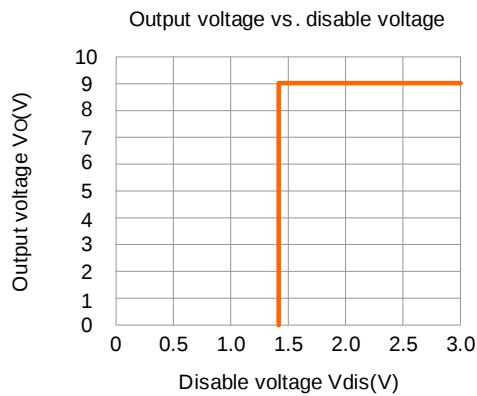
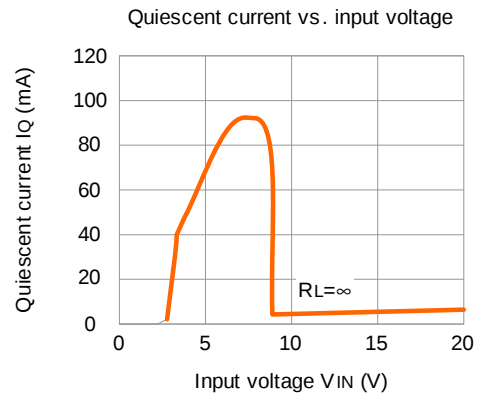
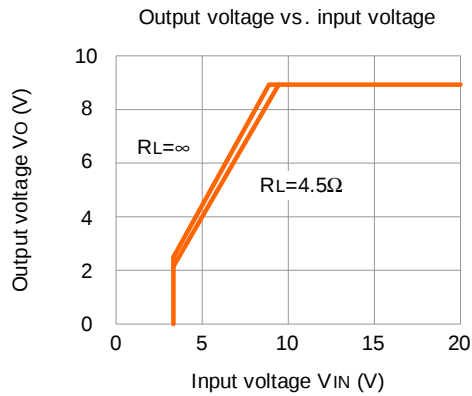
Quiescent current vs. temperature (T_j)



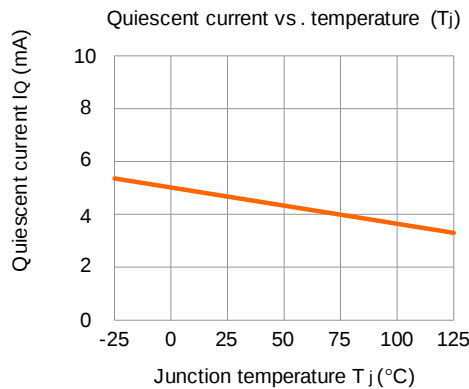
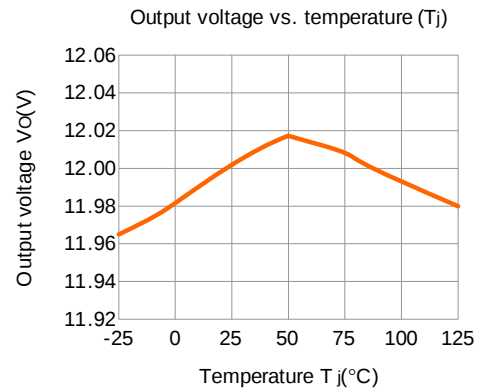
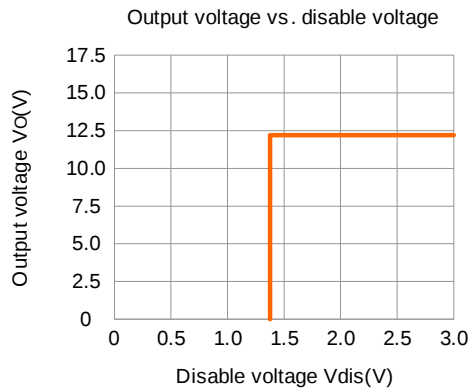
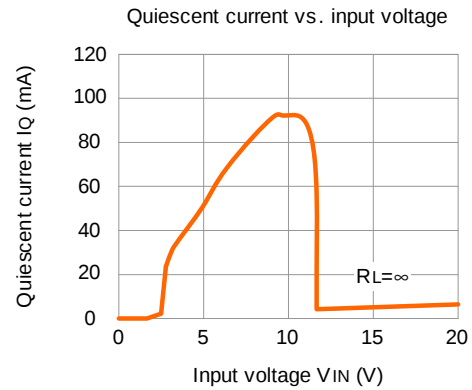
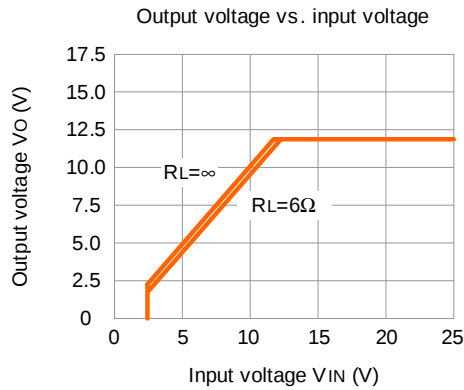
GGA278R08



GGA278R09

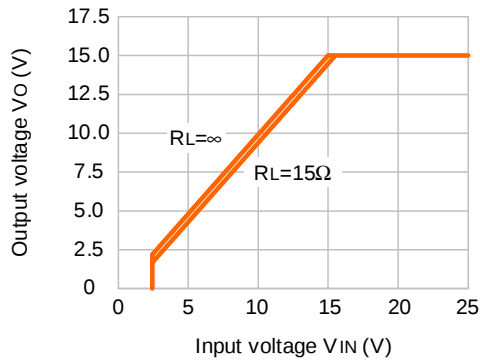


GGA278R12

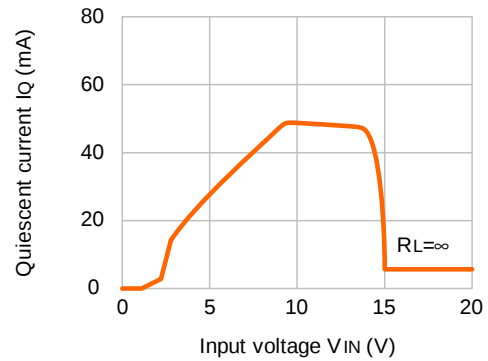


GGA278R15

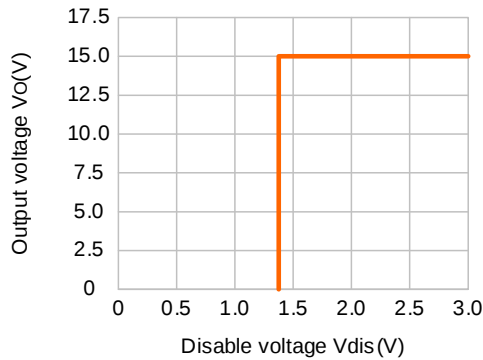
Output voltage vs. input voltage



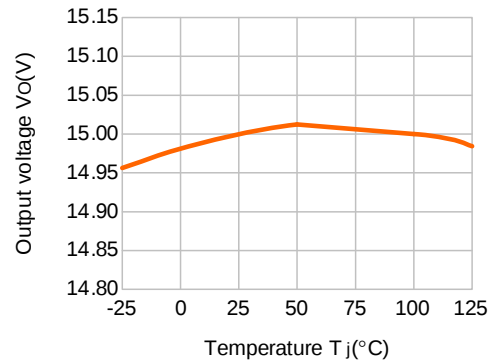
Quiescent current vs. input voltage



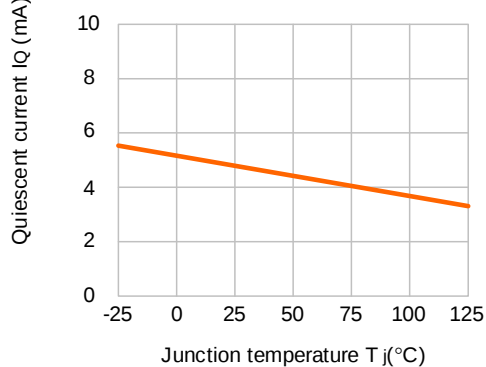
Output voltage vs. disable voltage



Output voltage vs. temperature (T_j)

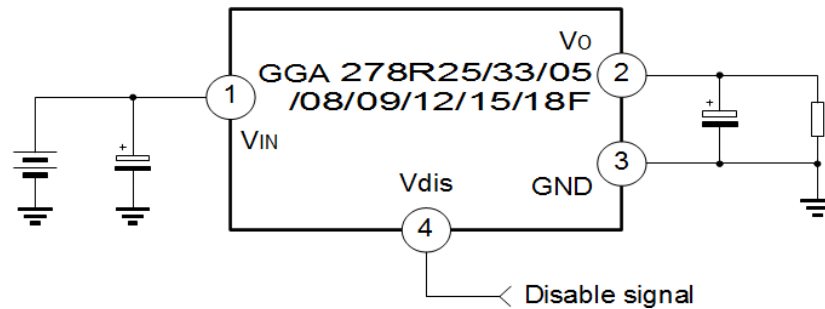


Quiescent current vs. temperature (T_j)

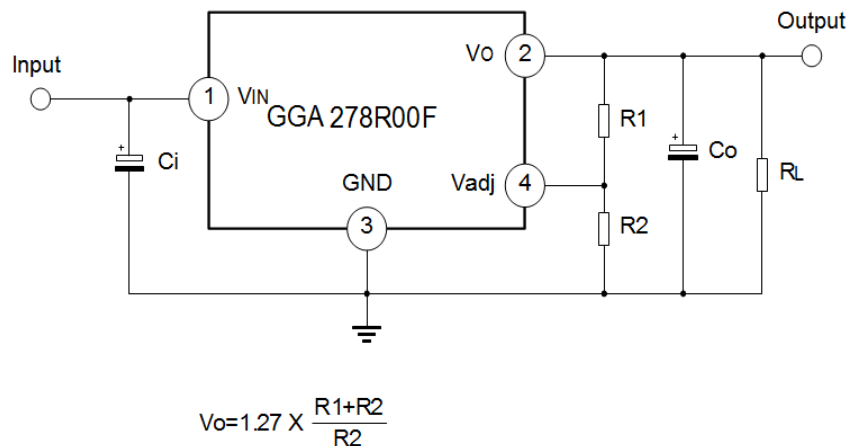


Applications Circuits

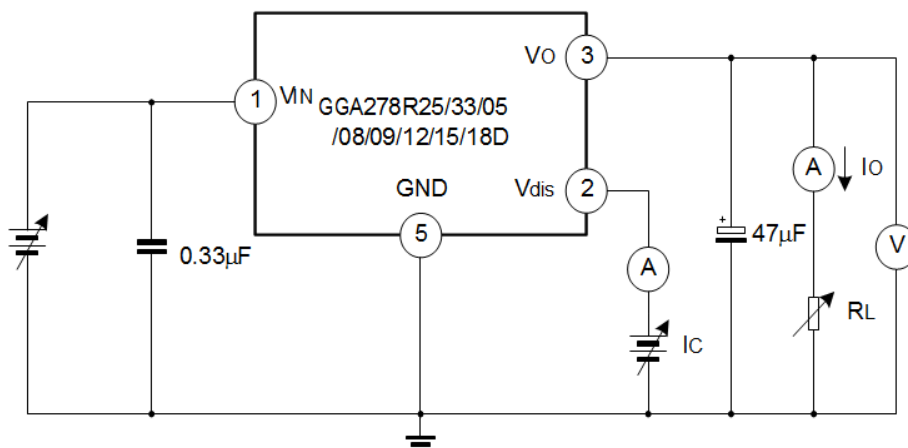
GGA278RXXF Fixed mode



GGA278RXXF Adjustable mode



GGA278RXXD Fixed mode

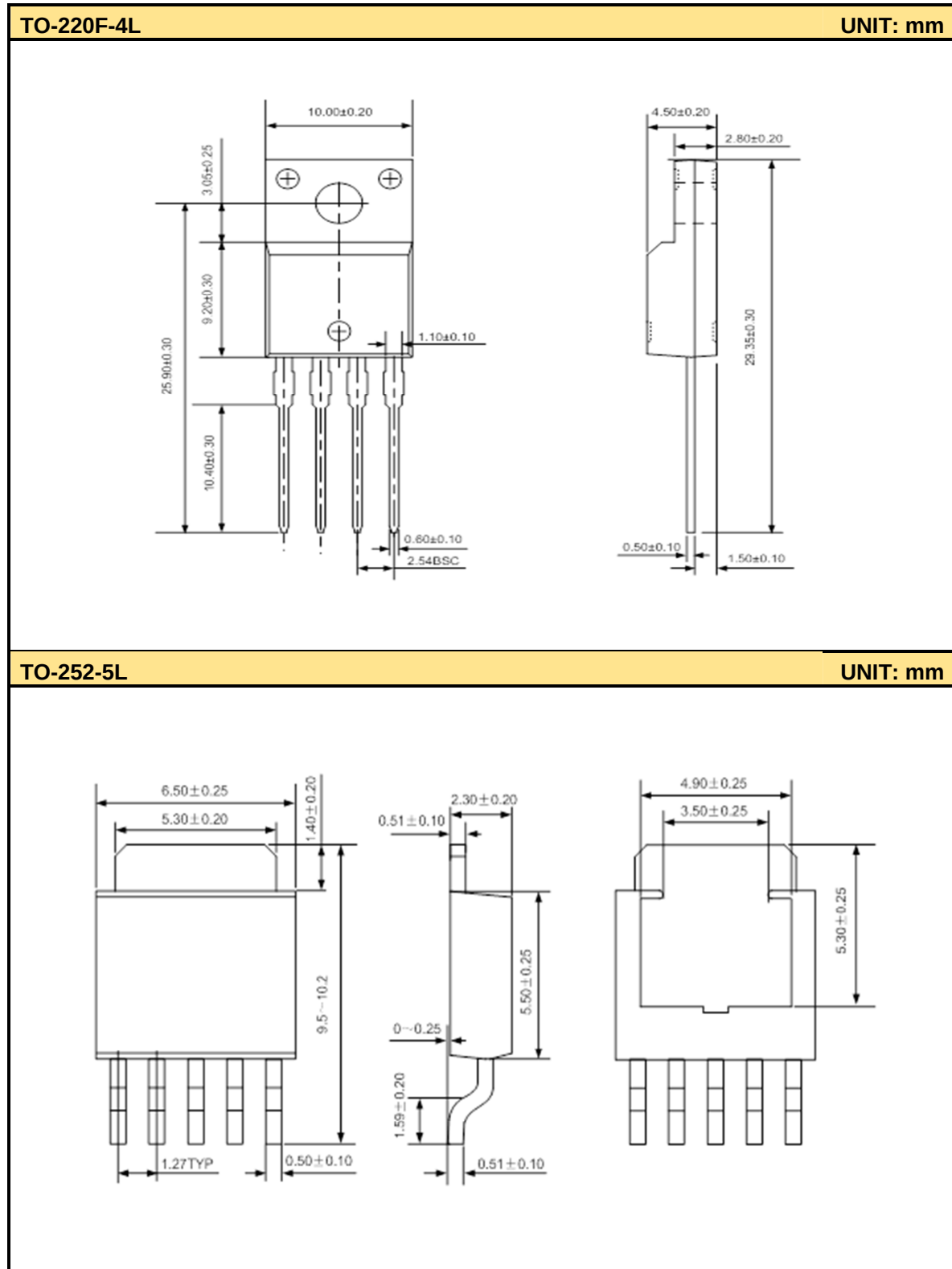


Note:

1. $C_o = 47\mu F$ or based on the real application
2. The circuit and parameters are for reference only, please set the parameters of the real application circuit based on actual testing



Package Outline



Disclaimer:

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