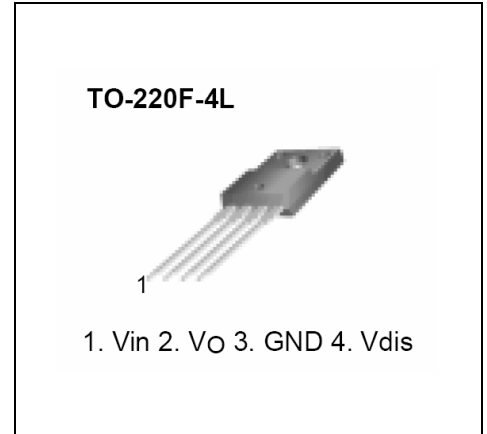


1A LOW DROPOUT POSITIVE REGULATOR

IL78RXX

Features

- 1A/3.3V, 5V, 8V, 9V, 12V, 15V output low dropout regulator
- TO-220 full-mold package (4Pin)
- Overcurrent protection ,thermal shutdown
- Overvoltage protection ,short circuit protection
- With output disable function



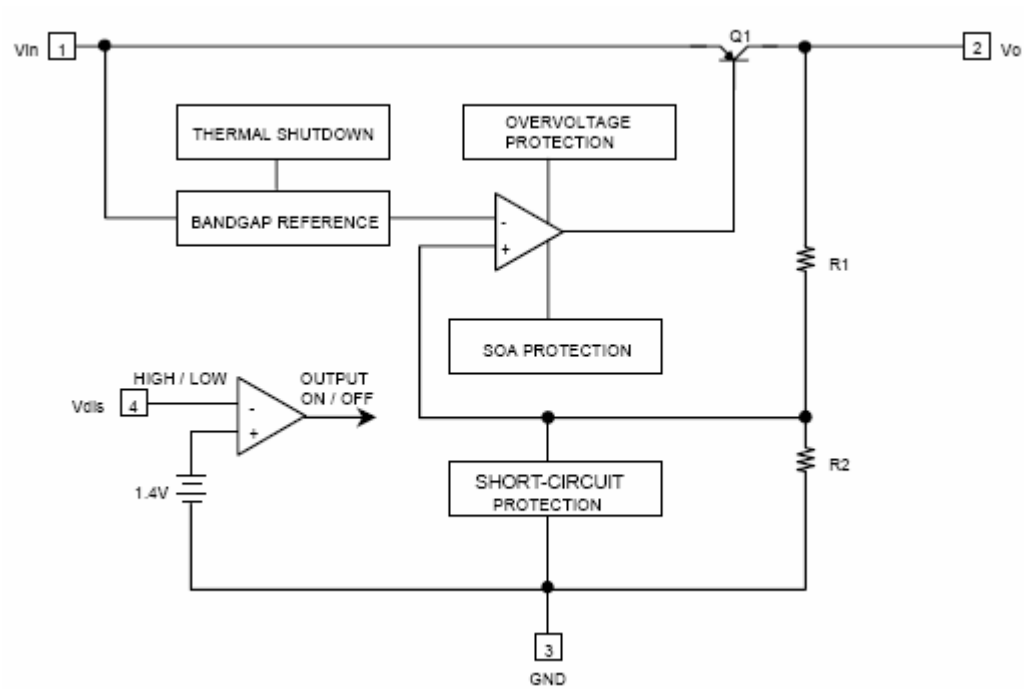
Description

The IL78RXX is a low dropout voltage regulator suitable for various electronic equipment. It provides constant voltage power source with TO-220 4 lead full-mold package. Dropout voltage of IL78RXX is below 0.5V in full rated current(1A). This regulator has various functions such as peak current protection, thermal shutdown, overvoltage protection and output disable function.

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Remark
Input voltage	Vin	35	V	-
Disable voltage	Vdis	35	V	-
Output current	I0	1.0	A	-
Power dissipation 1	Pd1	1.5	W	No heatsink
Power dissipation 2	Pd2	15	W	With heatsink
Junction temperature	Tj	+150	°C	-
Operating temperature	Topr	-20 ~ +80	°C	-

Internal Block Diagram



Electrical Characteristics

(Vin = Note 2, Io = 0.5A, Ta = 25°C, unless otherwise specified)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Output voltage	IL78R33	Vo	-	3.22	3.3	3.38	V
	IL78R05		-	4.88	5	5.12	
	IL78R08		-	7.8	8	8.2	
	IL78R09		-	8.78	9	9.22	
	IL78R12		-	11.7	12	12.3	
	IL78R15		-	14.6	15	15.4	
Load regulation		Rload	5mA<Io<1A	-	0.1	2.0	%
Line regulation		Rline	Note 3	-	0.5	2.5	%
Ripple rejection ratio		RR	Note 1	45	55	-	dB
Dropout voltage		Vdrop	Io = 1A	-	-	0.5	V
Disable voltage high		VdisH	Output active	2.0	-	-	V
Disable voltage low		VdisL	Output disabled	-	-	0.8	V
Disable bias current high		IdisH	Vdis = 2.7V	-	-	20	μA
Disable bias current low		IdisL	Vdis = 0.4V	-	-	-0.4	mA
Quiescent current		Iq	Io = 0A	-	-	10	mA

NOTE:

- These parameters, although guaranteed, are not 100% tested in production.
- IL78R33: Vin=5V
 IL78R05: Vin=7V
 IL78R08: Vin=10V
 IL78R09: Vin=11V
 IL78R12: Vin=15V
 IL78R15: Vin=20V
- IL78R33: Vin=4V to 10V
 IL78R05: Vin=6V to 12V
 IL78R08: Vin=9V to 25V
 IL78R09: Vin=10V to 25V
 IL78R12: Vin=13V to 29V
 IL78R15: Vin=16V to 30V

Typical Performance Characteristics
IL78R33

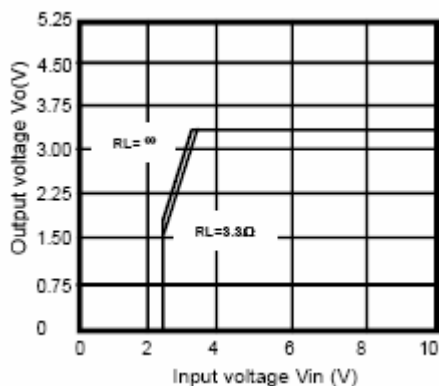


Figure 1. Output Voltage vs. Input Voltage

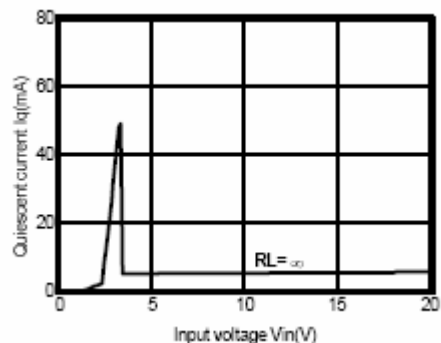


Figure 2. Quiescent Current vs. Input Voltage

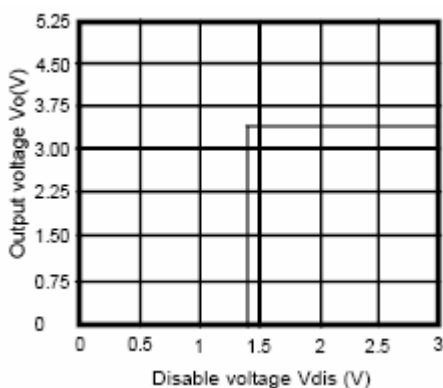


Figure 3. Output Voltage vs. Disable Voltage

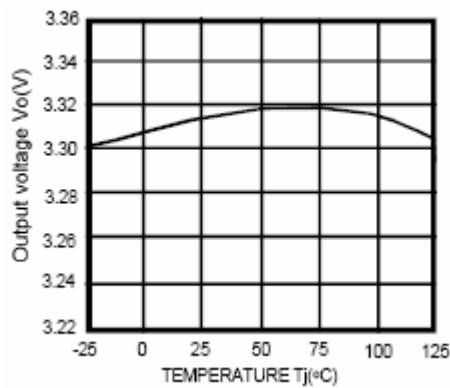


Figure 4. Output Voltage vs. Temperature(Tj)

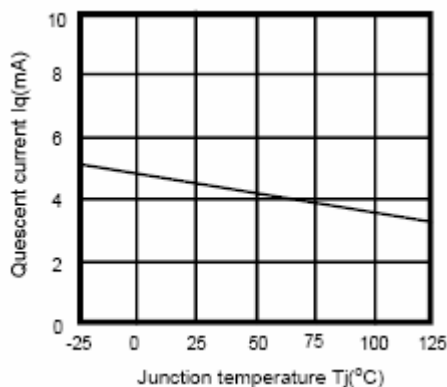


Figure 5. Quiescent Current vs. Temperature(Tj)

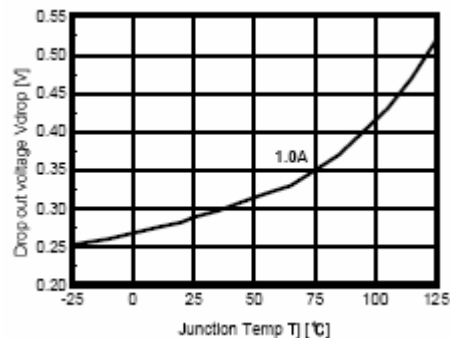


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (continued)

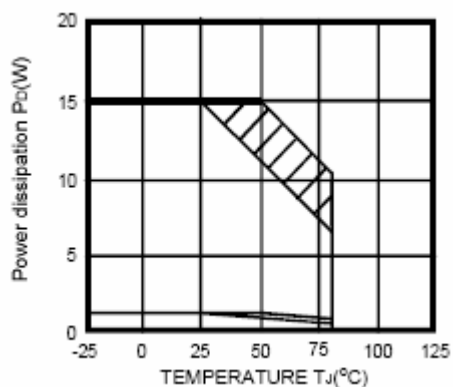


Figure 7. Power Dissipation vs. Temperature(T_j)

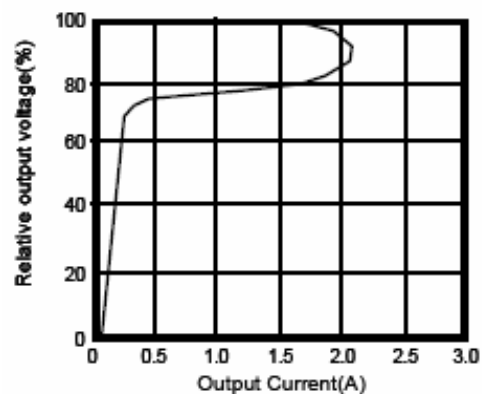


Figure 8. Overcurrent Protection Characteristics (Typical Value)

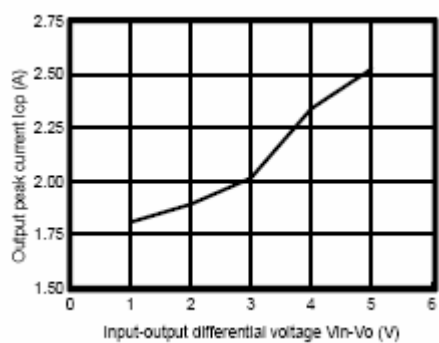


Figure 9. Output Peak Current vs. Input-Output Differential Voltage

Typical Performance Characteristics
IL78R05C

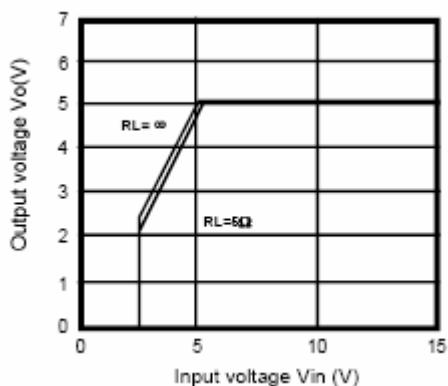


Figure 1. Output Voltage vs. Input Voltage

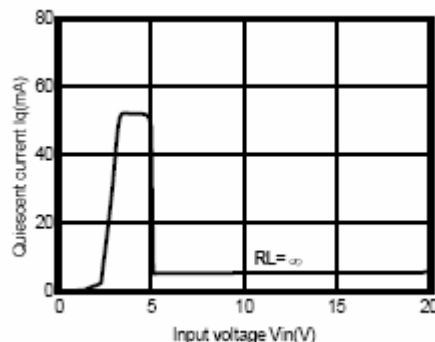


Figure 2. Quiescent Current vs. Input Voltage

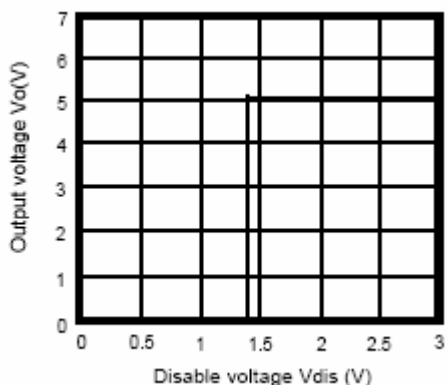


Figure 3. Output Voltage vs. Disable Voltage

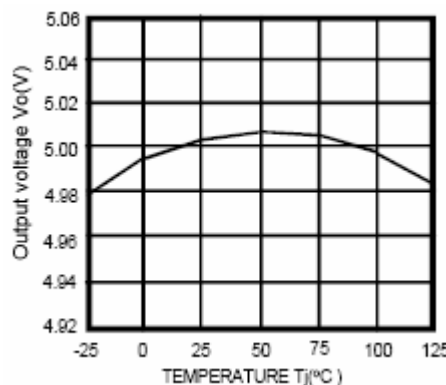


Figure 4. Output Voltage vs. Temperature(Tj)

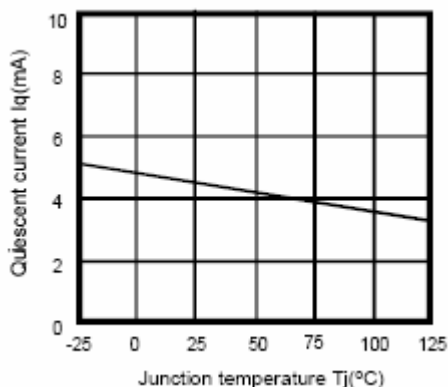


Figure 5. Quiescent Current vs. Temperature(Tj)

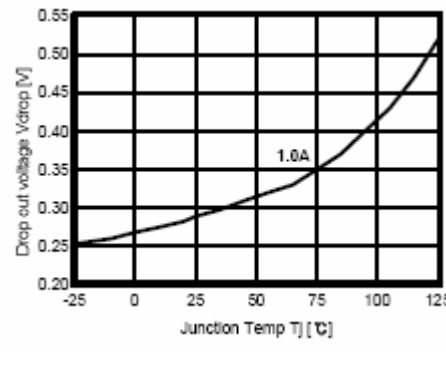


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (Continued)

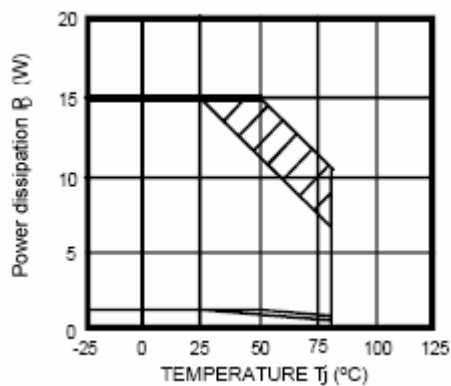


Figure 7. Power Dissipation vs. Temperature(T_j)

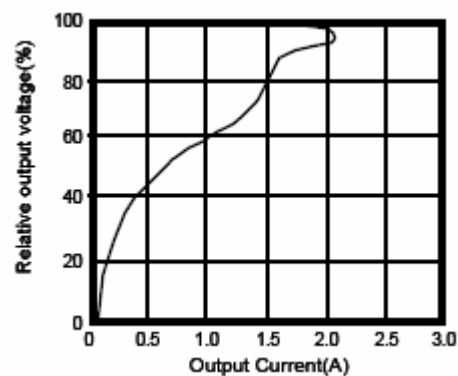


Figure 8. Overcurrent Protection Characteristics (Typical Value)

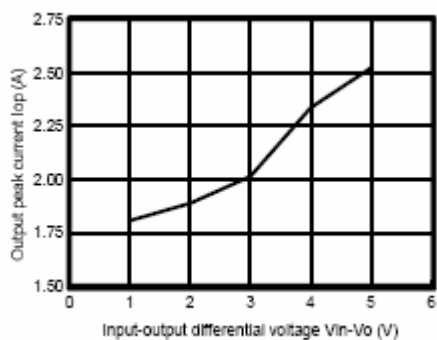


Figure 9. Output Peak Current vs. Input-Output Differential Voltage

Typical Performance Characteristics (Continued)

IL78R08C

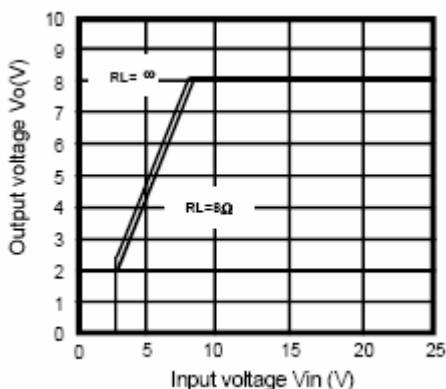


Figure 1. Output Voltage vs. Input Voltage

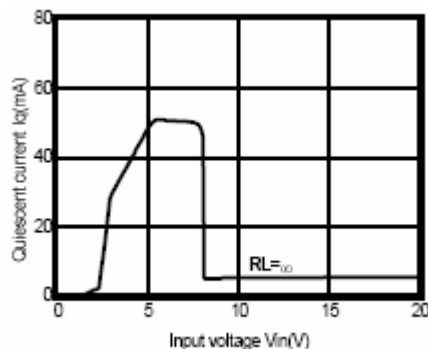


Figure 2. Quiescent Current vs. Input Voltage

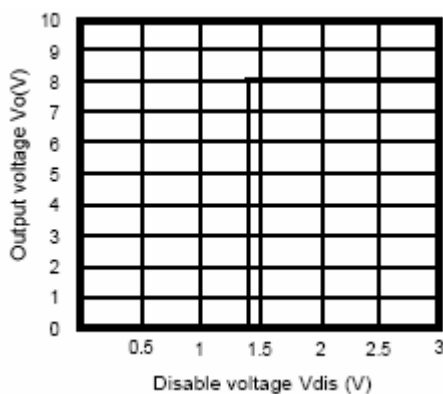


Figure 3. Output Voltage vs. Disable Voltage

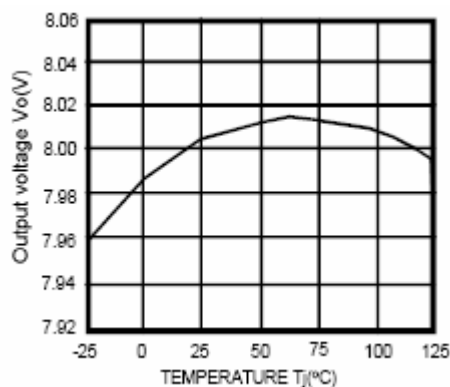


Figure 4. Output Voltage vs. Temperature(Tj)

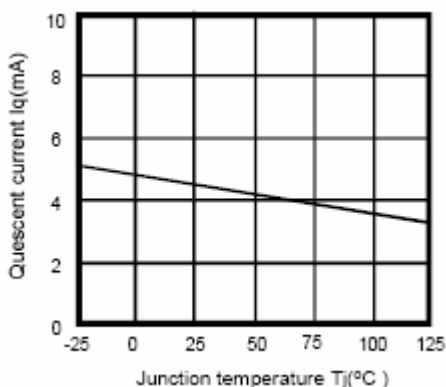


Figure 5. Quiescent Current vs. Temperature(Tj)

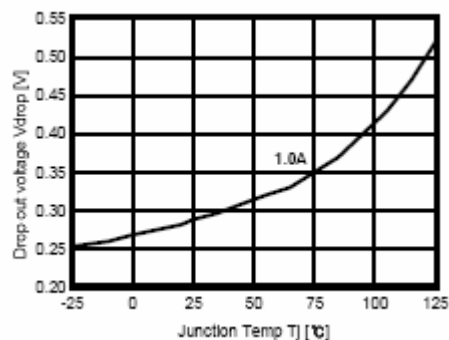


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (Continued)

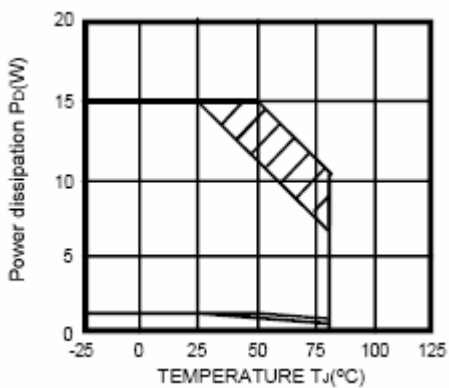


Figure 7. Power Dissipation vs. Temperature(T_j)

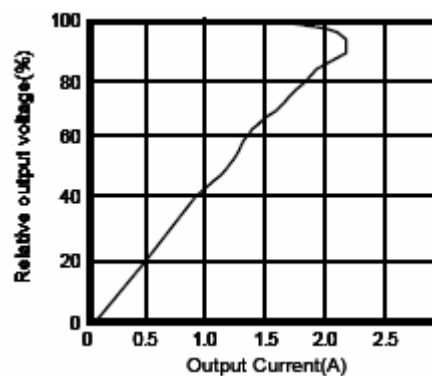


Figure 8. Overcurrent Protection Characteristics
(Typical Value)

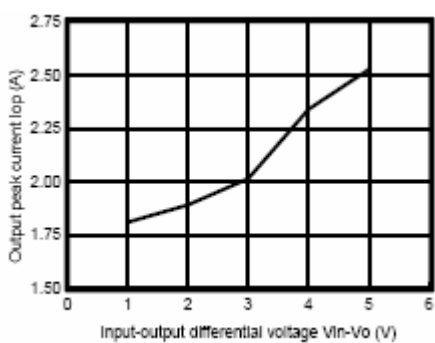


Figure 9. Output Peak Current vs.
Input-Output Differential Voltage

Typical Performance Characteristics (Continued)

IL78R09C

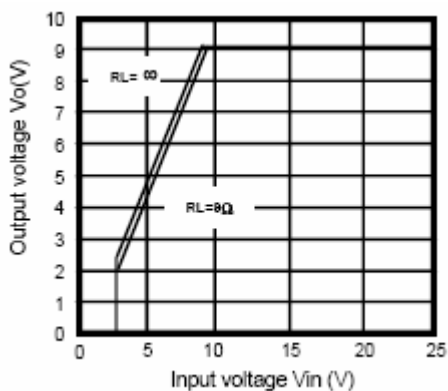


Figure 1. Output Voltage vs. Input Voltage

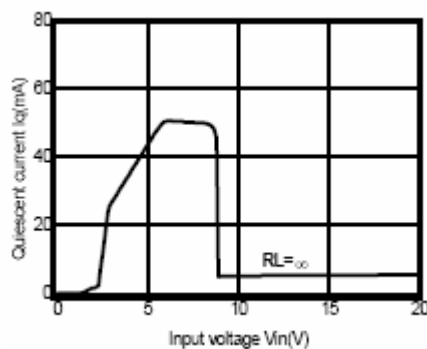


Figure 2. Quiescent Current vs. Input Voltage

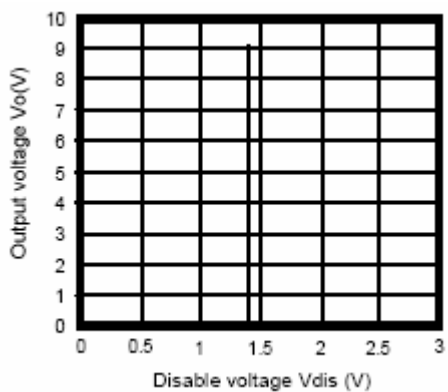


Figure 3. Output Voltage vs. Disable Voltage

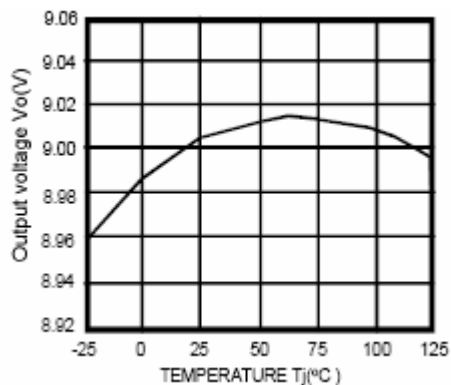


Figure 4. Output Voltage vs. Temperature(T_j)

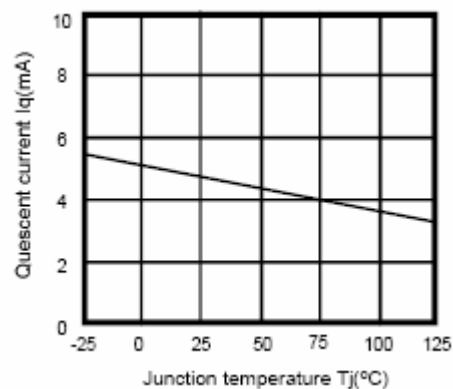


Figure 5. Quiescent Current vs. Temperature(T_j)

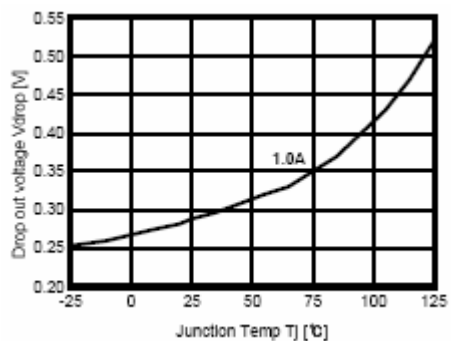


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (Continued)

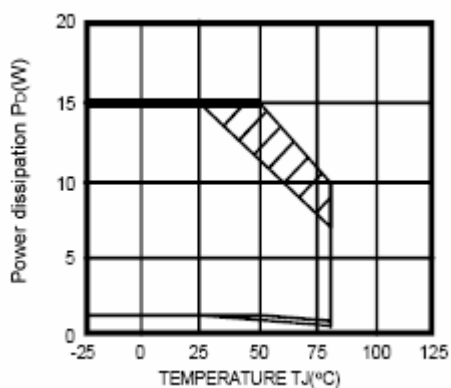


Figure 7. Power Dissipation vs. Temperature(T_j)

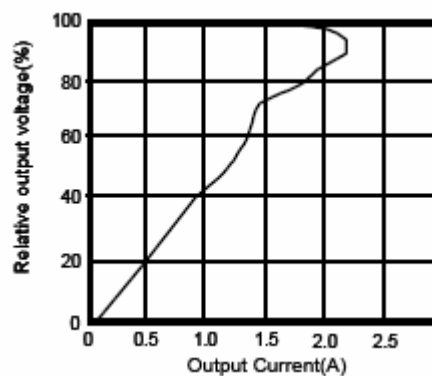


Figure 8. Overcurrent Protection Characteristics (Typical Value)

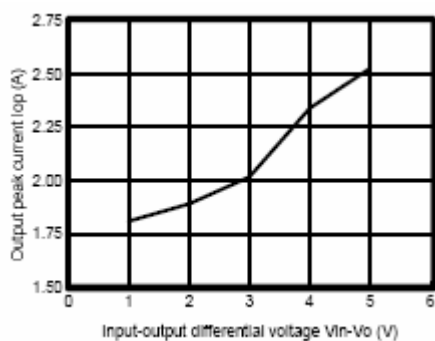


Figure 9. Output Peak Current vs. Input-Output Differential Voltage

Typical Performance Characteristics (Continued)

IL78R12C

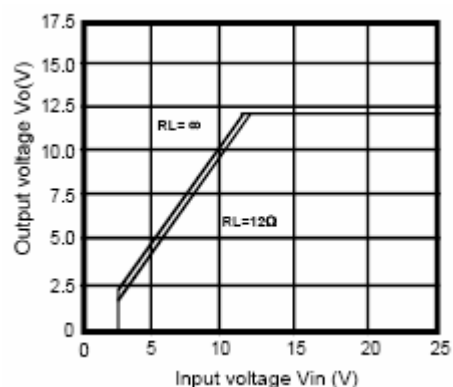


Figure 1. Output Voltage vs. Input Voltage

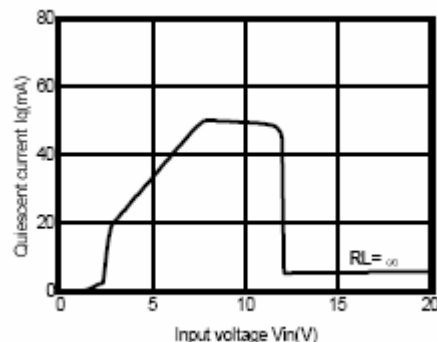


Figure 2. Quiescent Current vs. Input Voltage

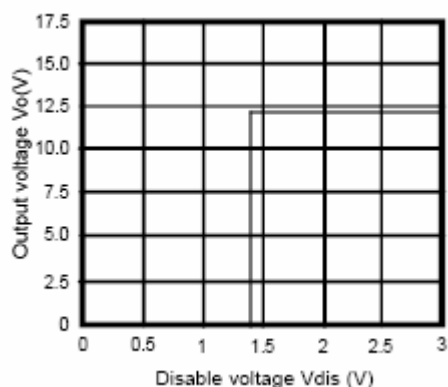


Figure 3. Output Voltage vs. Disable Voltage

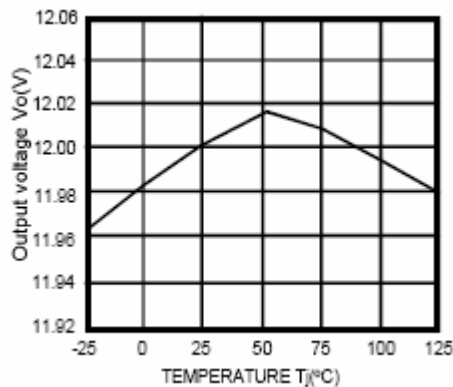


Figure 4. Output Voltage vs. Temperature(Tj)

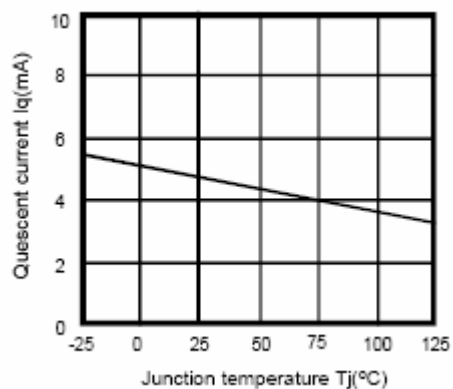


Figure 5. Quiescent Current vs. Temperature(Tj)

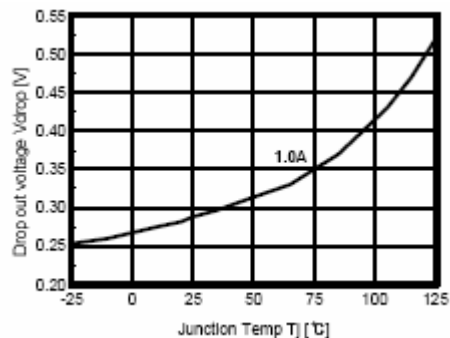


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (Continued)

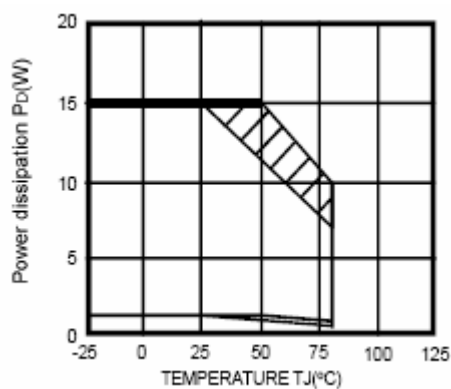


Figure 7. Power Dissipation vs. Temperature(T_j)

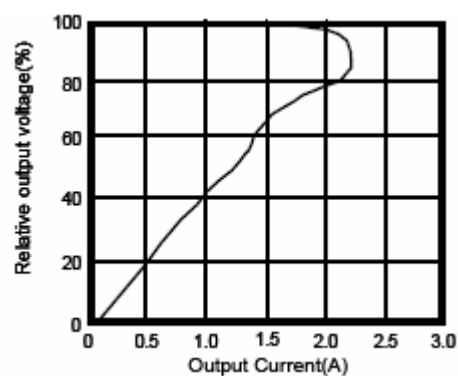


Figure 8. Overcurrent Protection Characteristics (Typical Value)

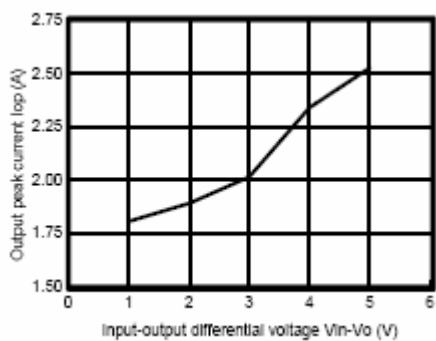


Figure 9. Output Peak Current vs. Input-Output Differential Voltage

Typical Performance Characteristics (Continued)

IL78R15C

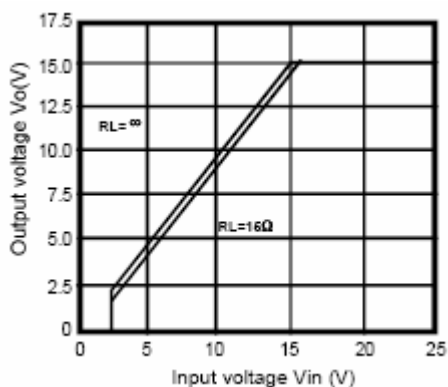


Figure 1. Output Voltage vs. Input Voltage

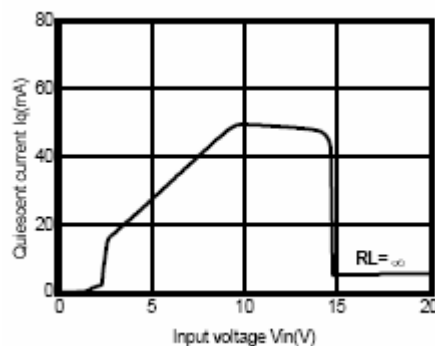


Figure 2. Quiescent Current vs. Input Voltage

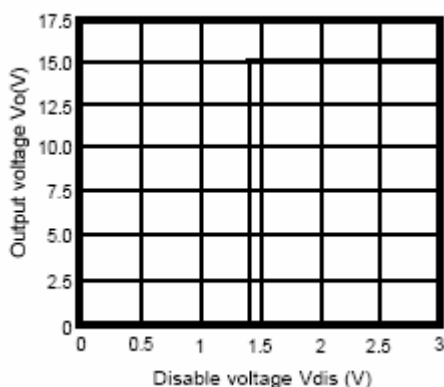


Figure 3. Output Voltage vs. Disable Voltage

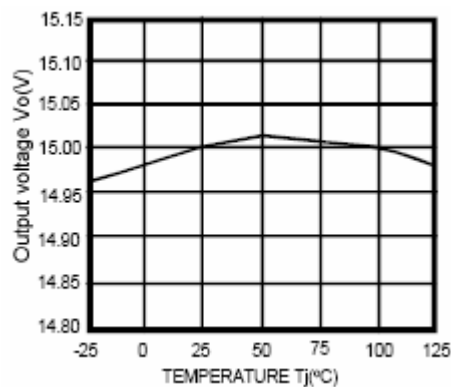


Figure 4. Output Voltage vs. Temperature(T_j)

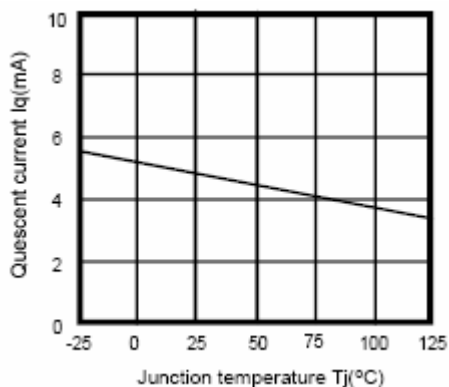


Figure 5. Quiescent Current vs. Temperature(T_j)

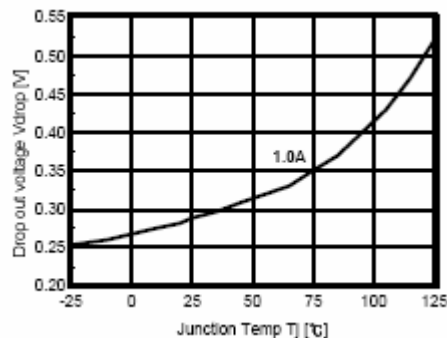


Figure 6. Dropout Voltage vs. Junction Temperature

Typical Performance Characteristics (Continued)

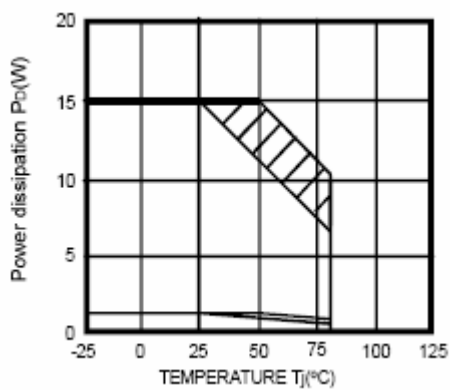


Figure 7. Power Dissipation vs. Temperature(T_j)

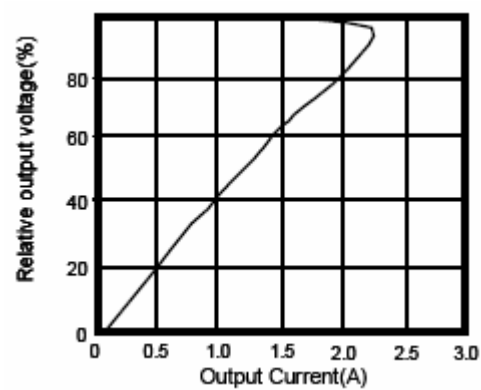


Figure 8. Overcurrent Protection Characteristics (Typical Value)

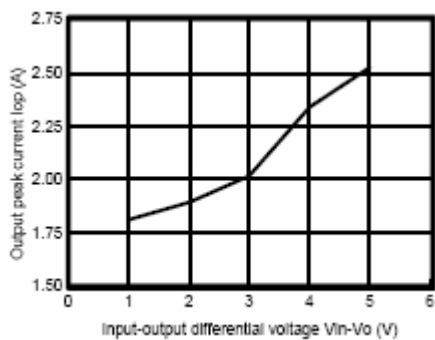


Figure 9. Output Peak Current vs. Input-Output Differential Voltage

Typical Application

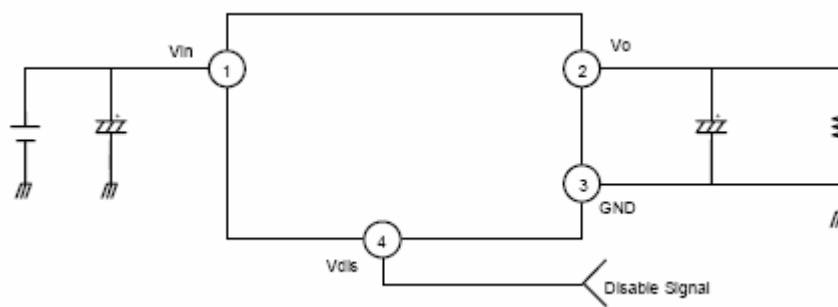


Figure 1. Application Circuit

- C_i is required if regulator is located at an appreciable distance from power supply filter.
- C_o improves stability and transient response. ($C_o > 47 \mu\text{F}$)

TO-220F-4L Package Outline Dimensions

Mechanical Dimensions

Package

Dimensions in millimeters

TO-220F-4L

