

Description

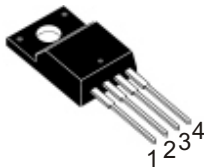
THE GM78R05 is a low - dropout voltage regulator , suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R05 is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

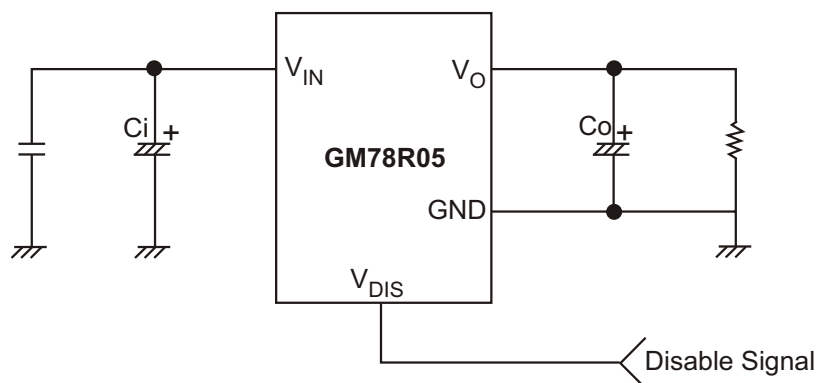
- ◆ 1A / 5V Output low dropout voltage regulator
- ◆ TO-220 Full-Mold package (4PIN)
- ◆ Overcurrent protection, Thermal shutdown
- ◆ Overvoltage protection, Short-Circuit Protection
- ◆ With output disable function

TYPIC APPLICATION CIRCUITS

TO- 220F- 4L



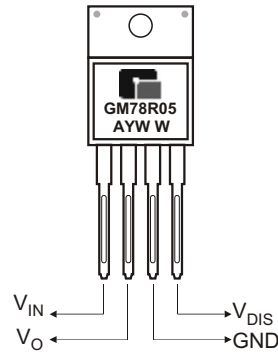
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



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

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO- 220F- 4L



A : Assembly Location
Y : Year
WW : Weekly

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R05TBF4T	TO- 220F- 4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

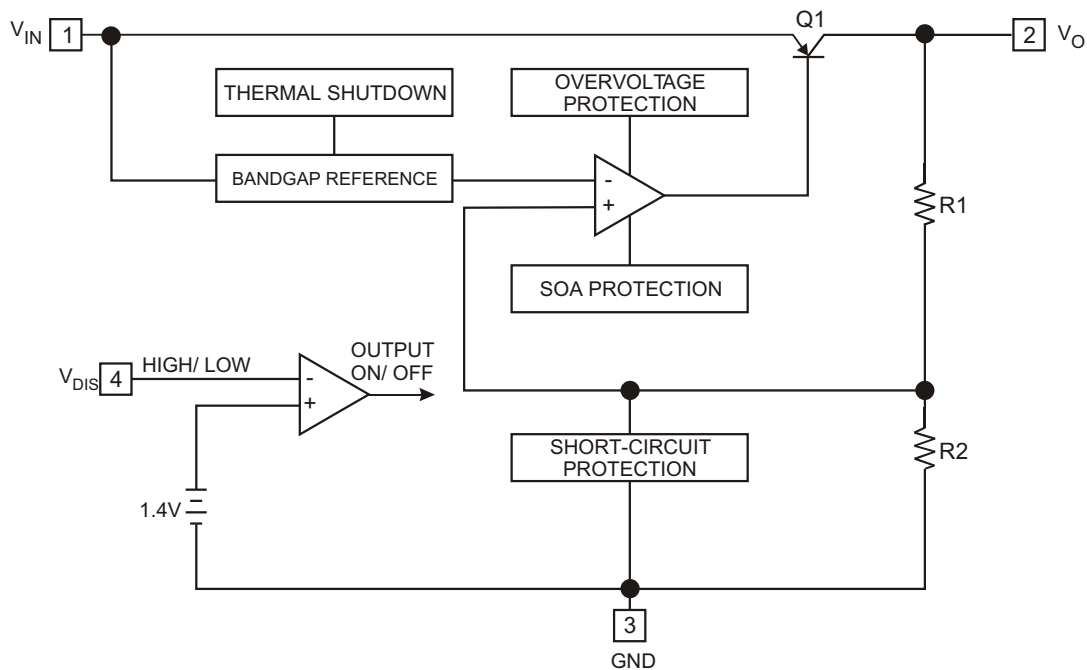
◆ **Electrical Characteristics** ($V_{IN} = 7V$, $I_O = 0.5A$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	4.88	5	5.12	V
Load Regulation	R_{load}	$5mA < I_O < 1A$	-	0.1	2.0	%
Line Regulation	R_{line}	$6V < V_{IN} < 12V$	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	$I_O = 1A$	-	-	0.5	V
Disable Voltage High	V_{disH}	Output Active	2.0	-	-	V
Disable Voltage Low	V_{disL}	Output Disabled	-	-	0.8	V
Disable Input Current High	I_{disH}	$V_{dis} = 2.7V$	-	-	20	μA
Disable Input Current Low	I_{disL}	$V_{dis} = 0.4V$	-	-	-0.4	mA
Quiescent Current	I_Q	$I_O = 0A$	-	-	10	mA

Note:

- These parameters, although guaranteed, are not 100% tested in production.
- Junction - to - case thermal resistance test environments.
 - Pneumatic heat sink fixture.
 - Clamping pressure 60psi through 12mm diameter cylinder.
 - Thermal grease applied between PKG and heat sink fixture.

◆ **BLOCK DIAGRAM(POSITIVE LOGIC)**



◆ TYPICAL PERFORMANCE CHARACTERISTICS

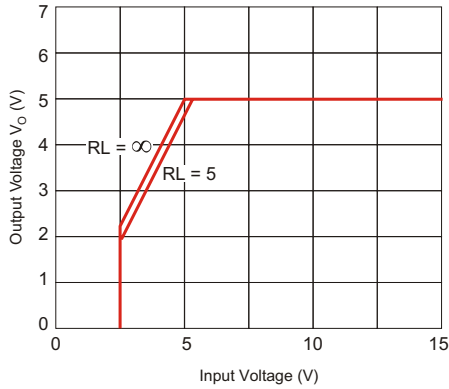


Figure 1. Output Voltage vs. Input Voltage

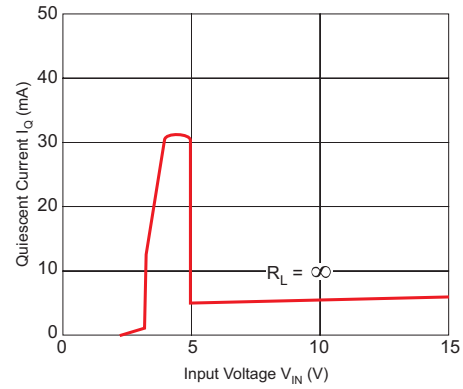


Figure 2. Quiescent Current vs. Input Voltage

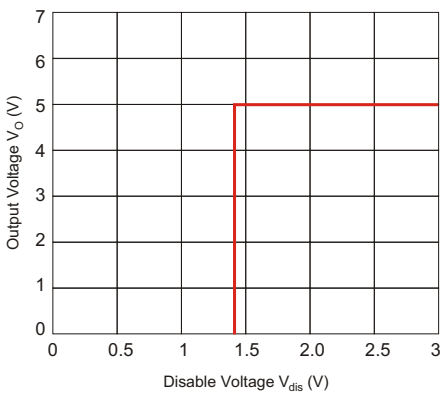


Figure 3. Output Voltage vs. Disable Voltage

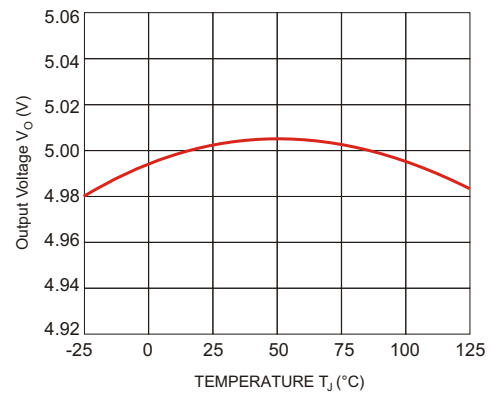


Figure 4. Output Voltage vs. Temperature (T_J)

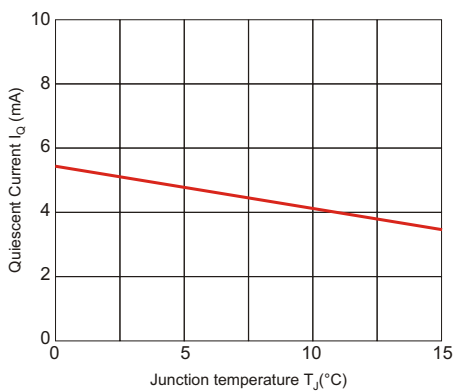


Figure 5. Quiescent Current vs. Temperature (T_J)

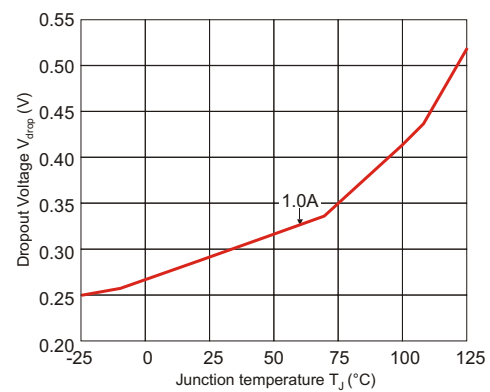


Figure 6. Dropout Voltage vs. Temperature (T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

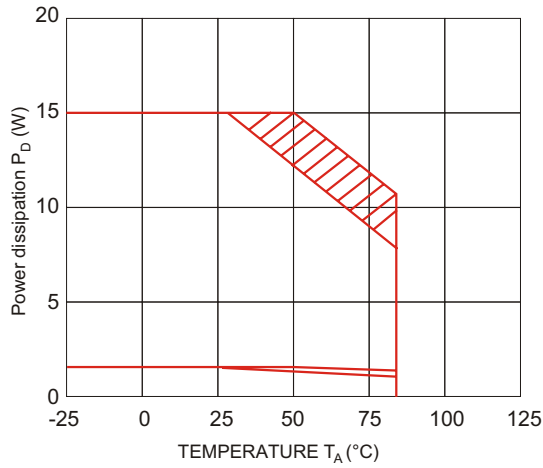
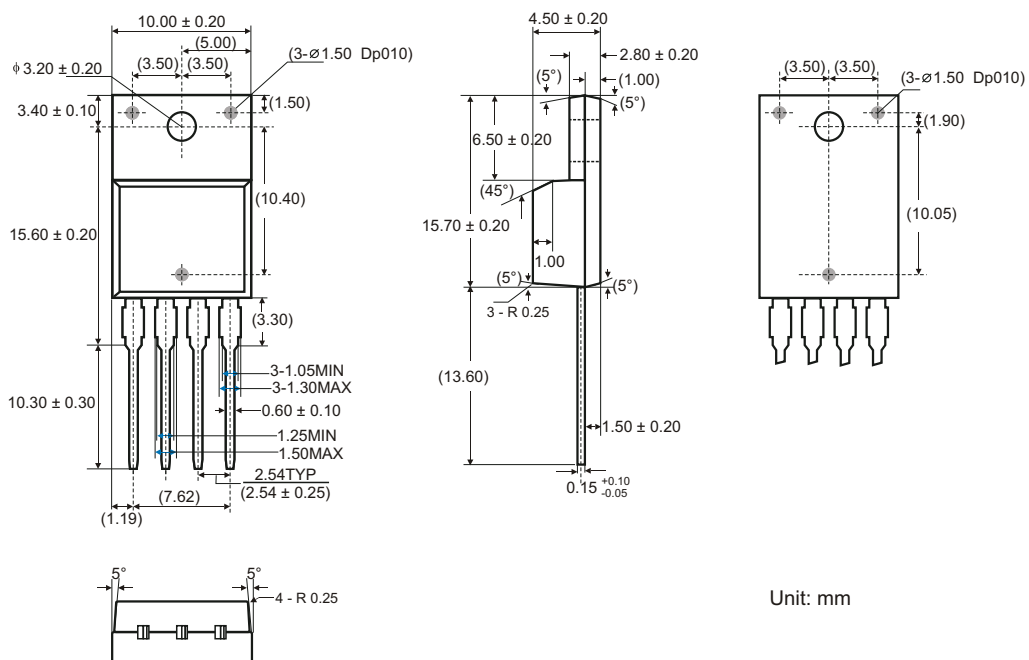
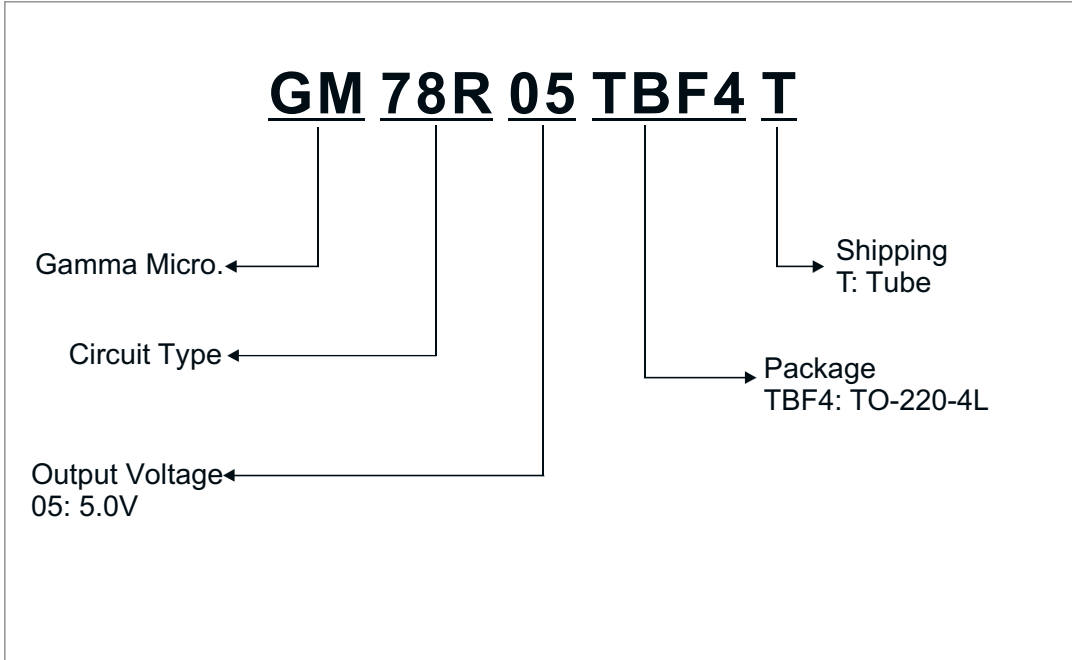




Figure 7. Power Dissipation vs. Temperature(T_A)

◆ TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS



◆ ORDERING NUMBER



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Description

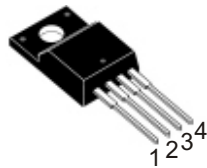
THE GM78R09 is a low - dropout voltage regulator , suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R09 is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

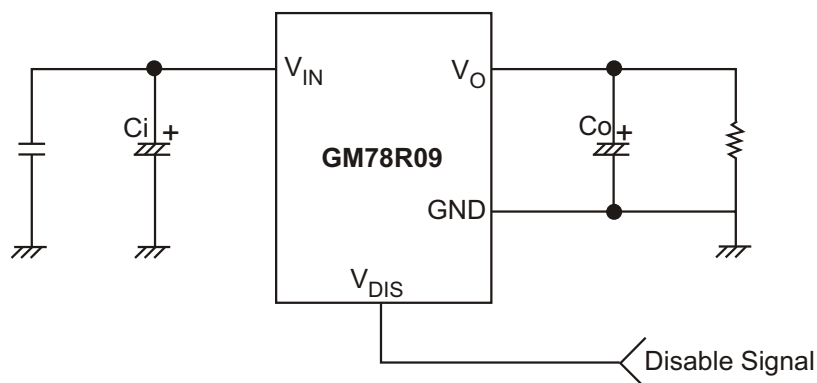
- ◆ 1A / 9.0 V Output low dropout voltage regulator
- ◆ TO-220 Full-Mold package (4PIN)
- ◆ Overcurrent protection, Thermal shutdown
- ◆ Overvoltage protection, Short-Circuit Protection
- ◆ With output disable function

TYPIC APPLICATION CIRCUITS

TO - 220F - 4L



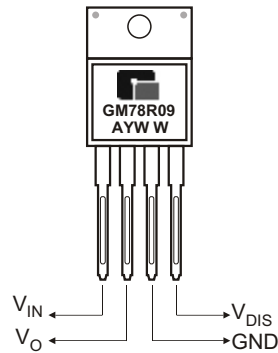
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



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

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



A : Assembly Location
Y : Year
WW : Weekly

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R09TBF4T	TO - 220F -4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

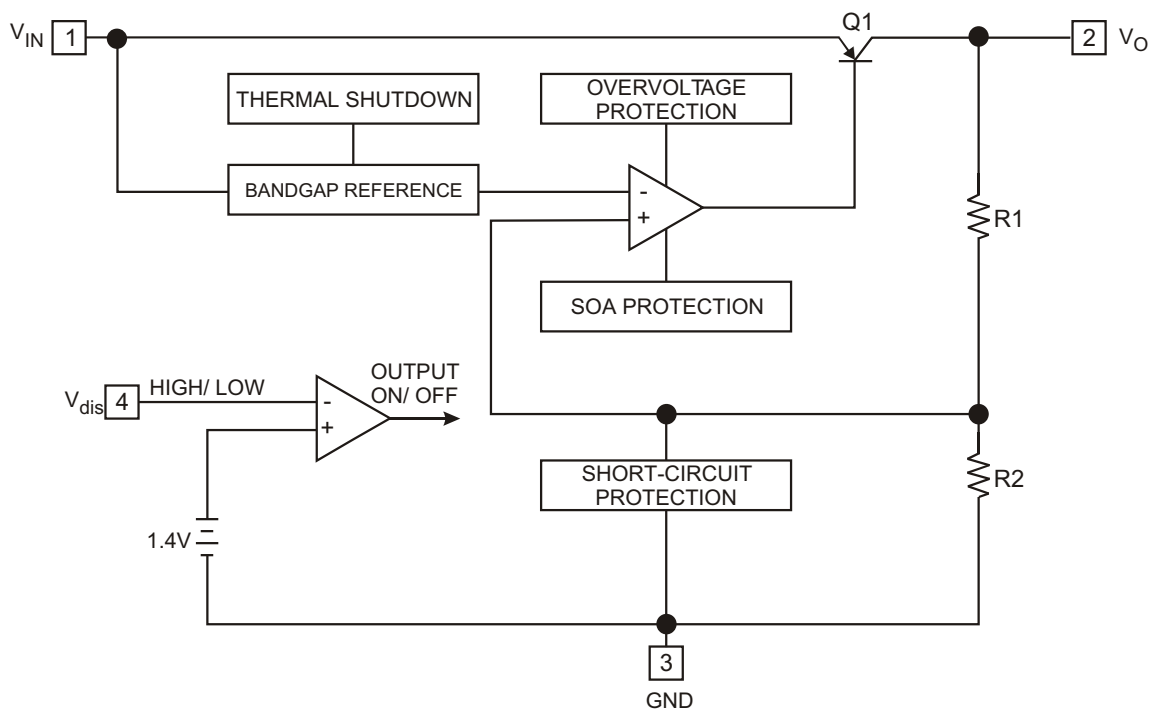
◆ **Electrical Characteristics** ($V_{IN} = 7V$, $I_O = 0.5A$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	8.78	9	9.22	V
Load Regulation	R_{load}	$5mA < I_O < 1A$	-	0.1	2.0	%
Line Regulation	R_{line}	$6V < V_{IN} < 12V$	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	$I_O = 1A$	-	-	0.5	V
Disable Voltage High	V_{disH}	Output Active	2.0	-	-	V
Disable Voltage Low	V_{disL}	Output Disabled	-	-	0.8	V
Disable Input Current High	I_{disH}	$V_{dis} = 2.7V$	-	-	20	μA
Disable Input Current Low	I_{disL}	$V_{dis} = 0.4V$	-	-	-0.4	mA
Quiescent Current	I_Q	$I_O = 0A$	-	-	10	mA

Note:

1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
 - Pneumatic heat sink fixture.
 - Clamping pressure 60psi through 12mm diameter cylinder.
 - Thermal grease applied between PKG and heat sink fixture.

◆ **BLOCK DIAGRAM(POSITIVE LOGIC)**



◆ TYPICAL PERFORMANCE CHARACTERISTICS

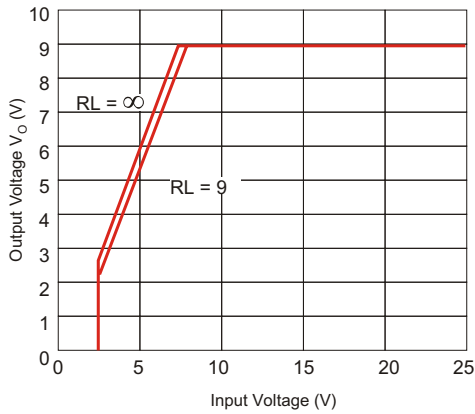


Figure 1. Output Voltage vs. Input Voltage

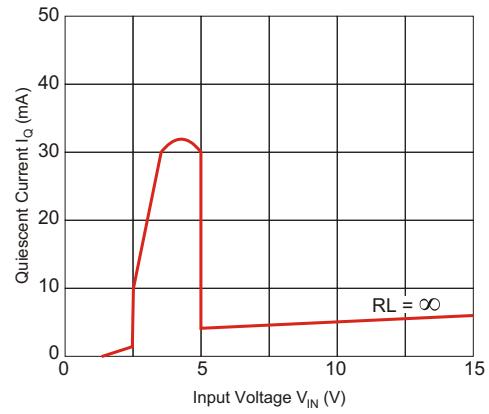


Figure 2. Quiescent Current vs. Input Voltage

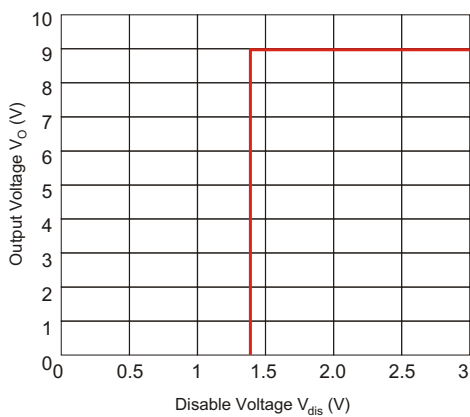


Figure 3. Output Voltage vs. Disable Voltage

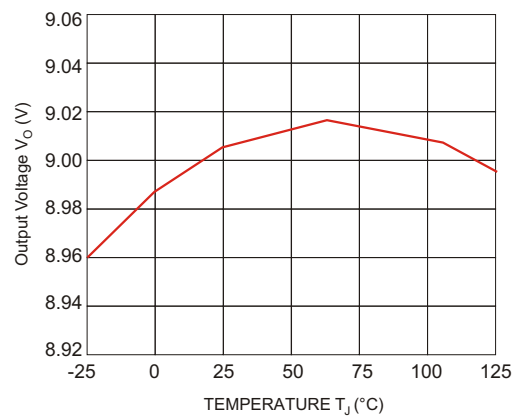


Figure 4. Output Voltage vs. Temperature (T_J)

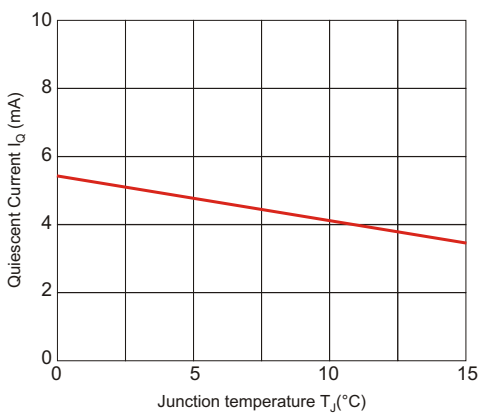


Figure 5. Quiescent Current vs. Temperature (T_J)

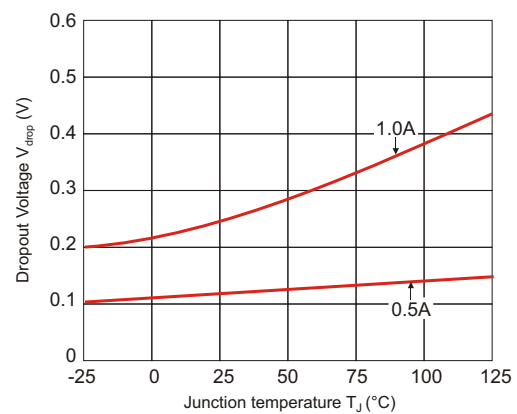


Figure 6. Dropout Voltage vs. Temperature (T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

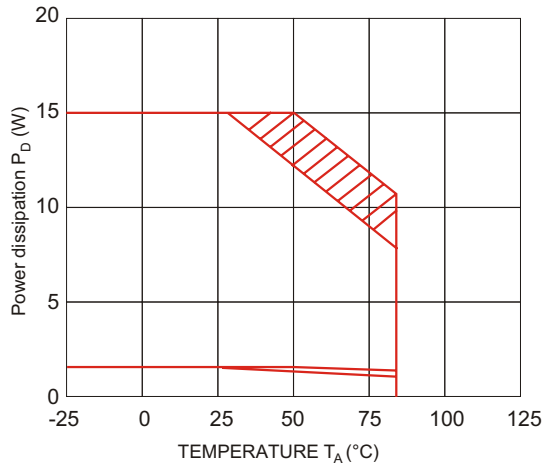
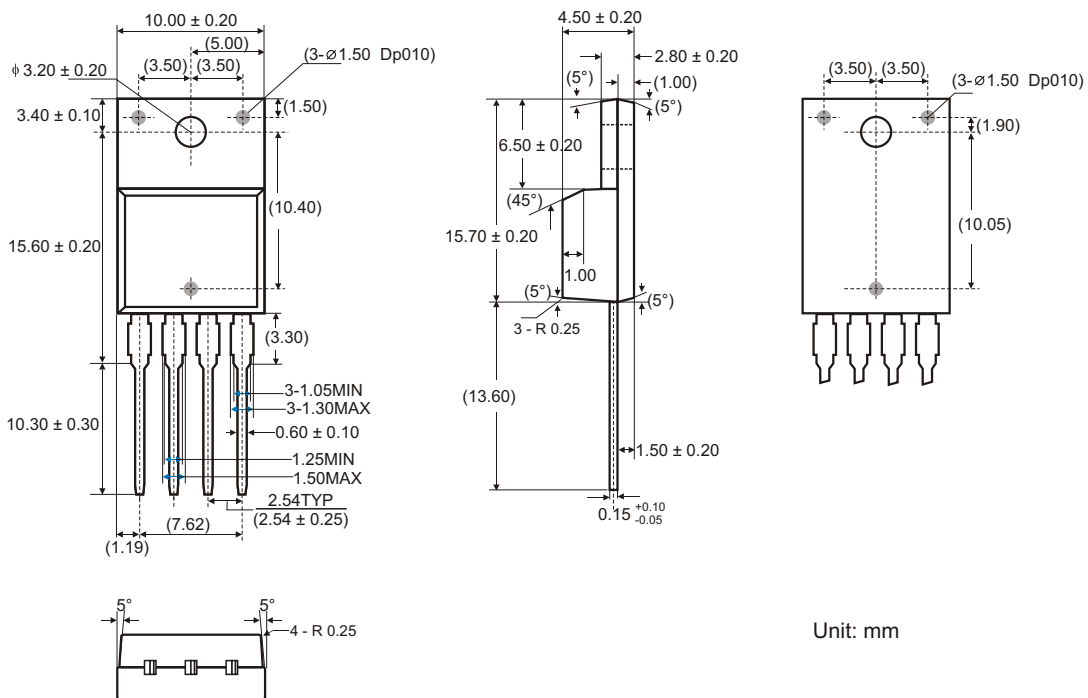


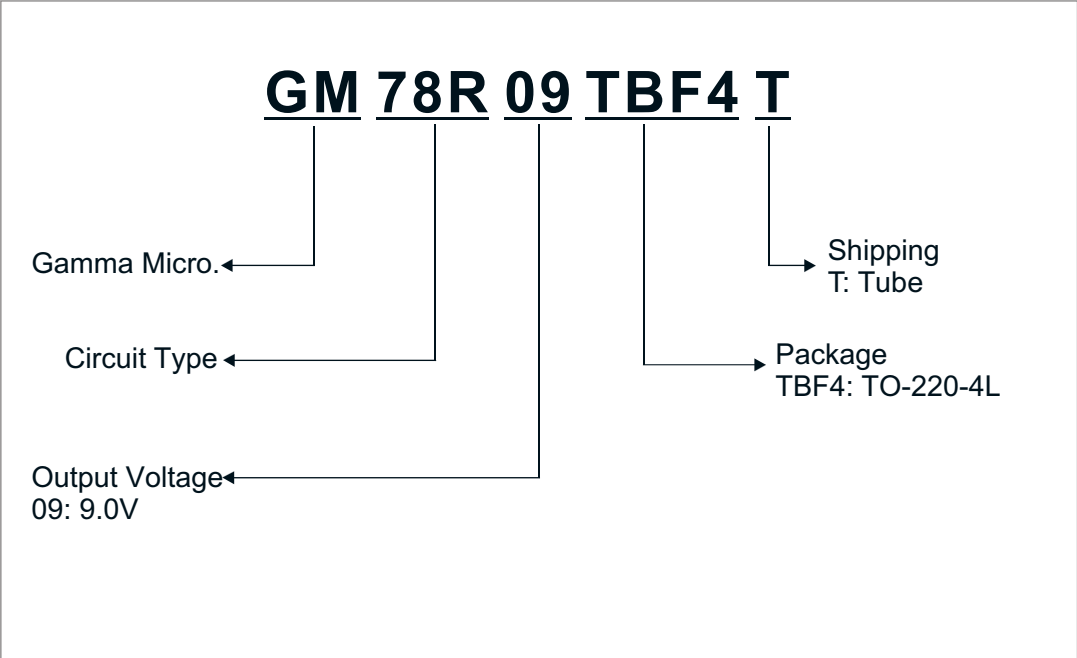
Figure 7. Power Dissipation vs. Temperature(T_A)



◆ TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS





◆ ORDERING NUMBER



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Description

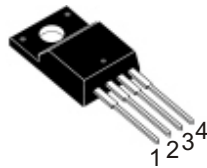
THE GM78R12 is a low - dropout voltage regulator , suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R12 is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

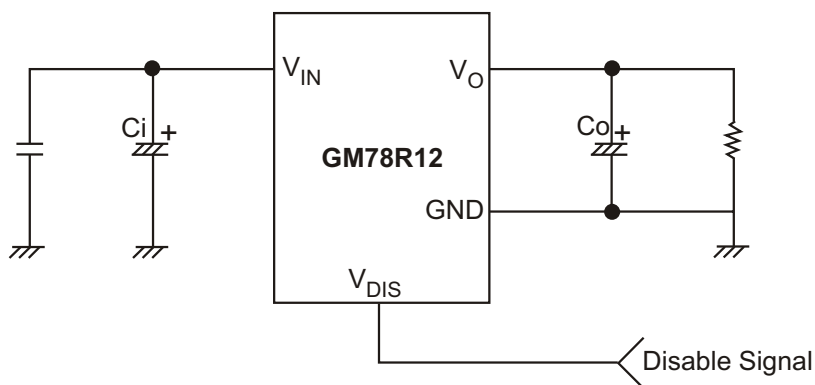
- ◆ 1A / 12V Output low dropout voltage regulator
- ◆ TO-220 Full-Mold package (4PIN)
- ◆ Overcurrent protection, Thermal shutdown
- ◆ Overvoltage protection, Short-Circuit Protection
- ◆ With output disable function

TYPIC APPLICATION CIRCUITS

TO-220F- 4L



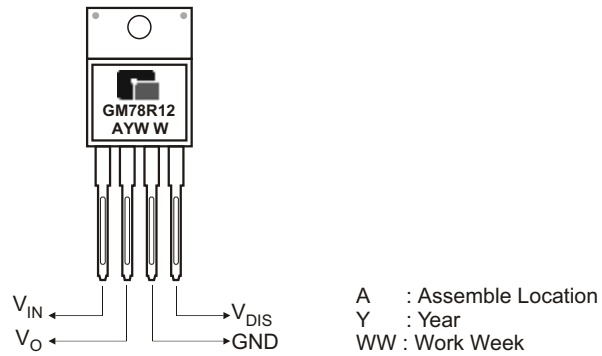
- 1. V_{IN}
- 2. V_O
- 3. GND
- 4. V_{DIS}



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

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R12TBF4T	TO - 220F-4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

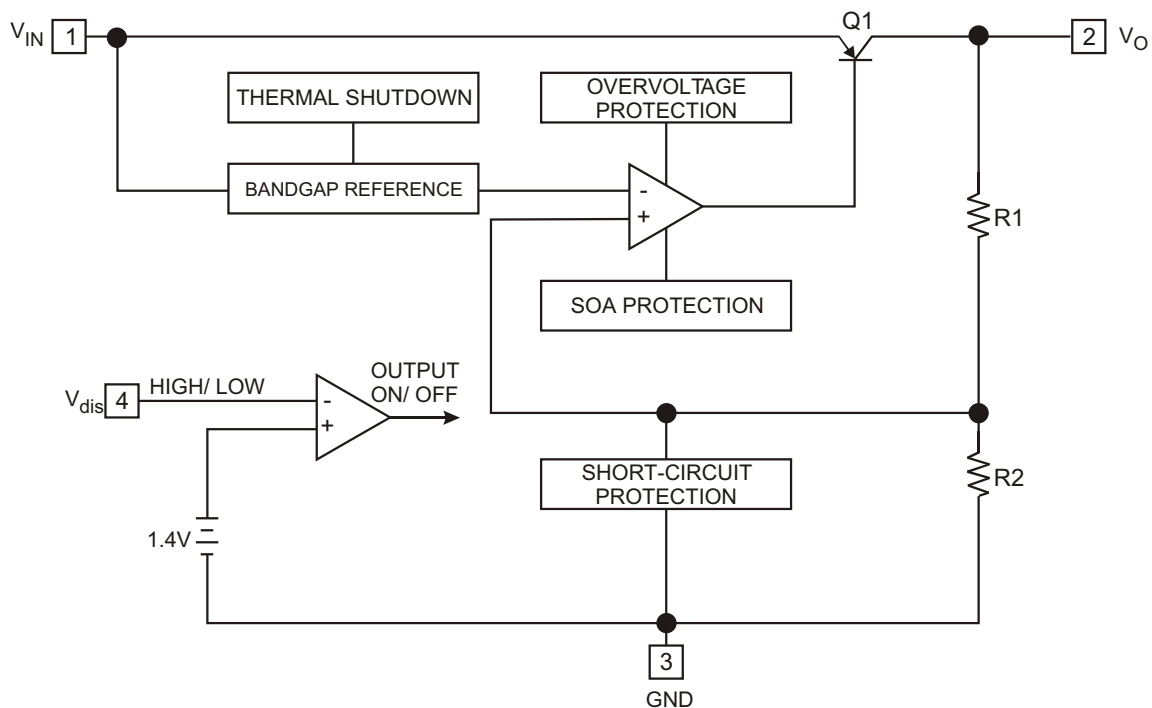
◆ **Electrical Characteristics** ($V_{IN} = 15V$, $I_O = 0.5A$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	11.7	12	12.3	V
Load Regulation	R_{load}	$5mA < I_O < 1A$	-	0.1	2.0	%
Line Regulation	R_{line}	$6V < V_{IN} < 12V$	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	$I_O = 1A$	-	-	0.5	V
Disable Voltage High	V_{disH}	Output Active	2.0	-	-	V
Disable Voltage Low	V_{disL}	Output Disabled	-	-	0.8	V
Disable Input Current High	I_{disH}	$V_{dis} = 2.7V$	-	-	20	μA
Disable Input Current Low	I_{disL}	$V_{dis} = 0.4V$	-	-	-0.4	mA
Quiescent Current	I_Q	$I_O = 0A$	-	-	10	mA

Note:

1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
 - Pneumatic heat sink fixture.
 - Clamping pressure 60psi through 12mm diameter cylinder.
 - Thermal grease applied between PKG and heat sink fixture.

◆ **BLOCK DIAGRAM (POSITIVE LOGIC)**



◆ TYPICAL PERFORMANCE CHARACTERISTICS

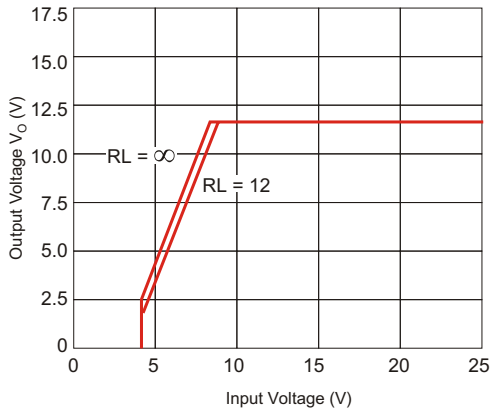


Figure 1. Output Voltage vs. Input Voltage

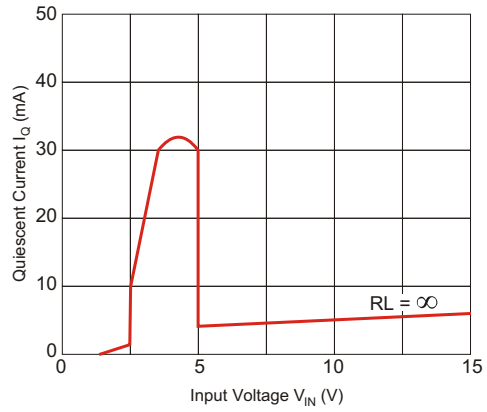


Figure 2. Quiescent Current vs. Input Voltage

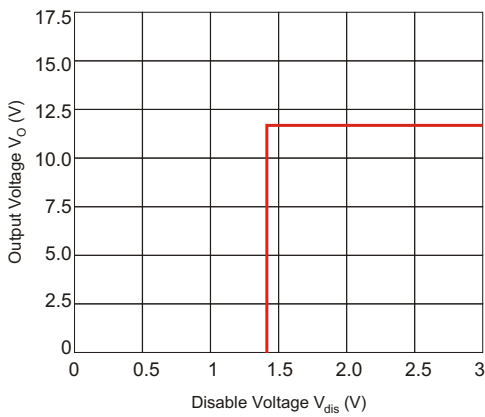


Figure 3. Output Voltage vs. Disable Voltage

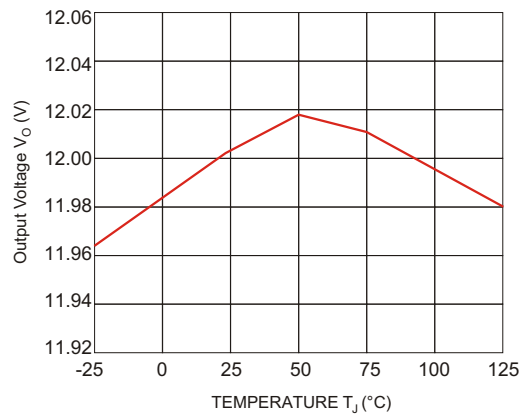


Figure 4. Output Voltage vs. Temperature (T_J)

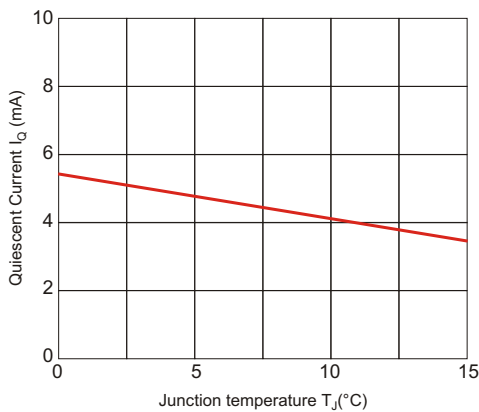


Figure 5. Quiescent Current vs. Temperature(T_J)

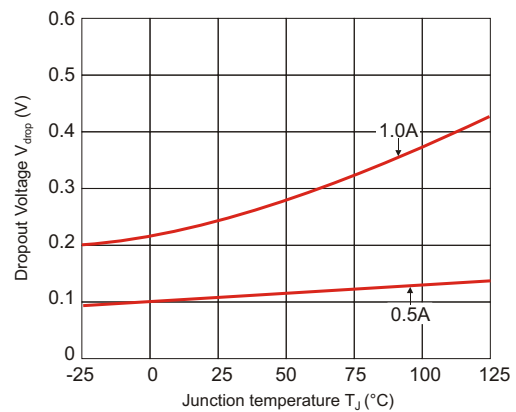


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ **TYPICAL PERFORMANCE CHARACTERISTICS**

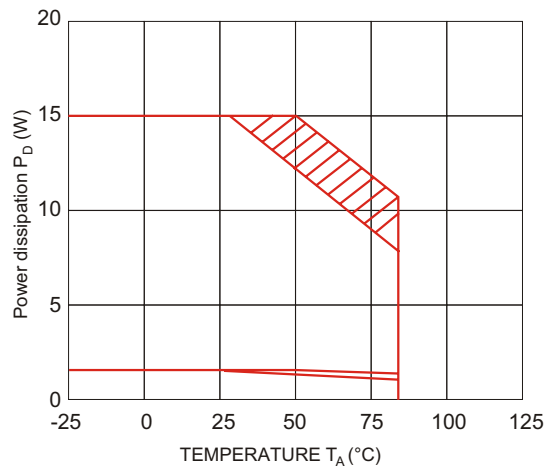
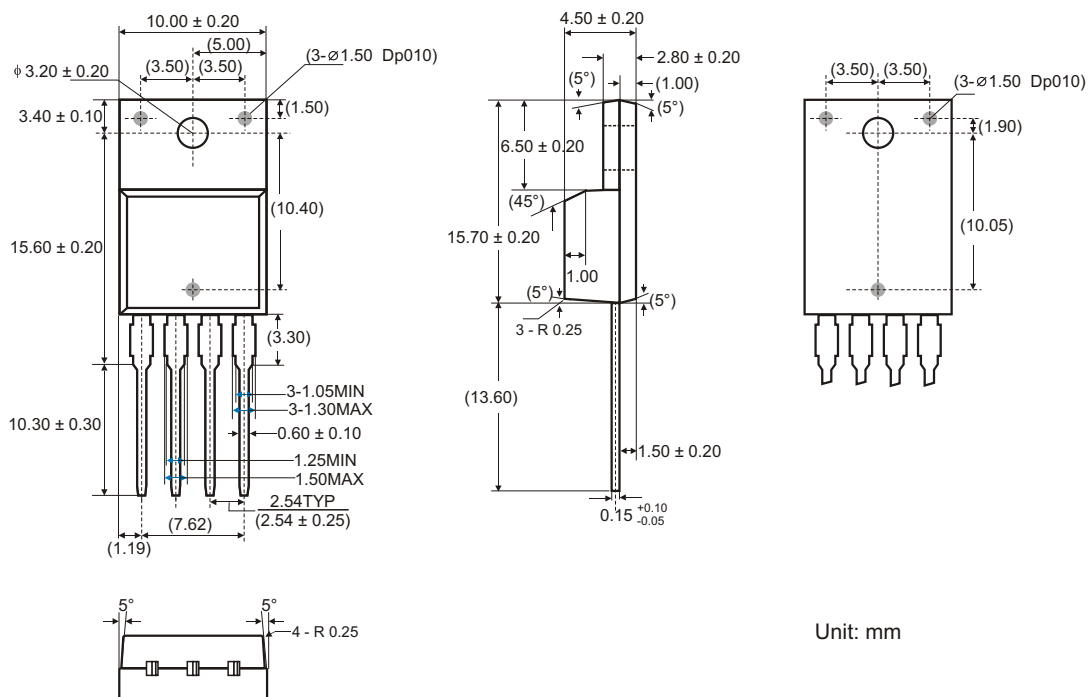
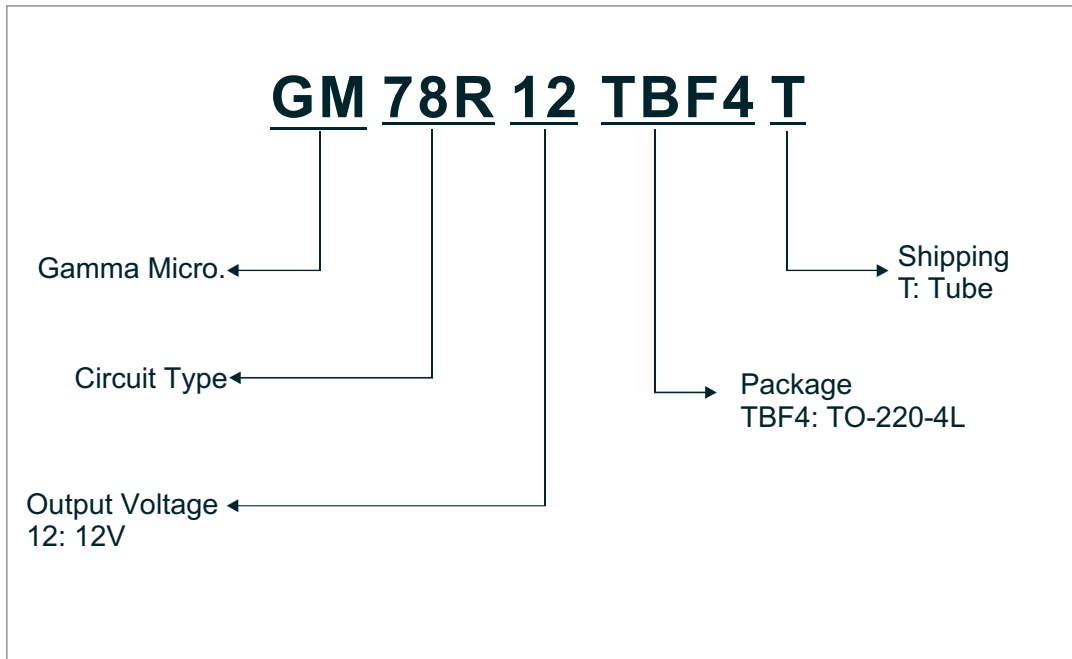




Figure 7. Power Dissipation vs. Temperature(T_A)

◆ **TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS**



◆ ORDERING NUMBER



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Description

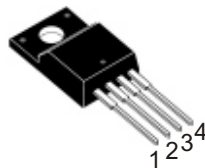
The GM78R33 is a low - dropout voltage regulator , suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R33 is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable func-

Features

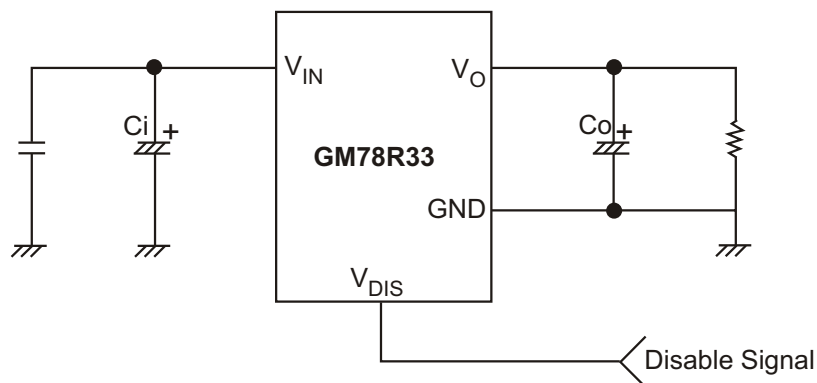
- ◆ 1A / 3.3V Output low dropout voltage regulator
- ◆ TO-220 Full-Mold package (4PIN)
- ◆ Overcurrent protection, Thermal shutdown
- ◆ Overvoltage protection, Short-Circuit Protection
- ◆ With output disable function

TYPICAL APPLICATION CIRCUITS

TO-220F- 4L



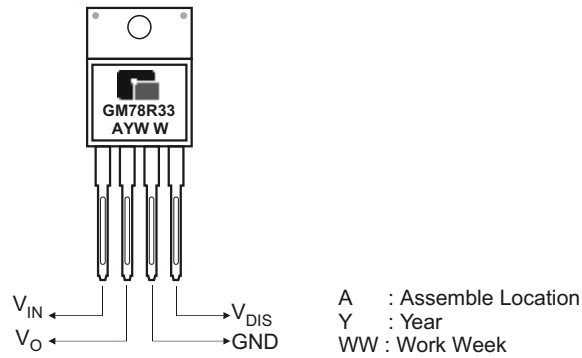
- 1. V_{IN}
- 2. V_O
- 3. GND
- 4. V_{DIS}



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

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R33TBF4T	TO - 220F-4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

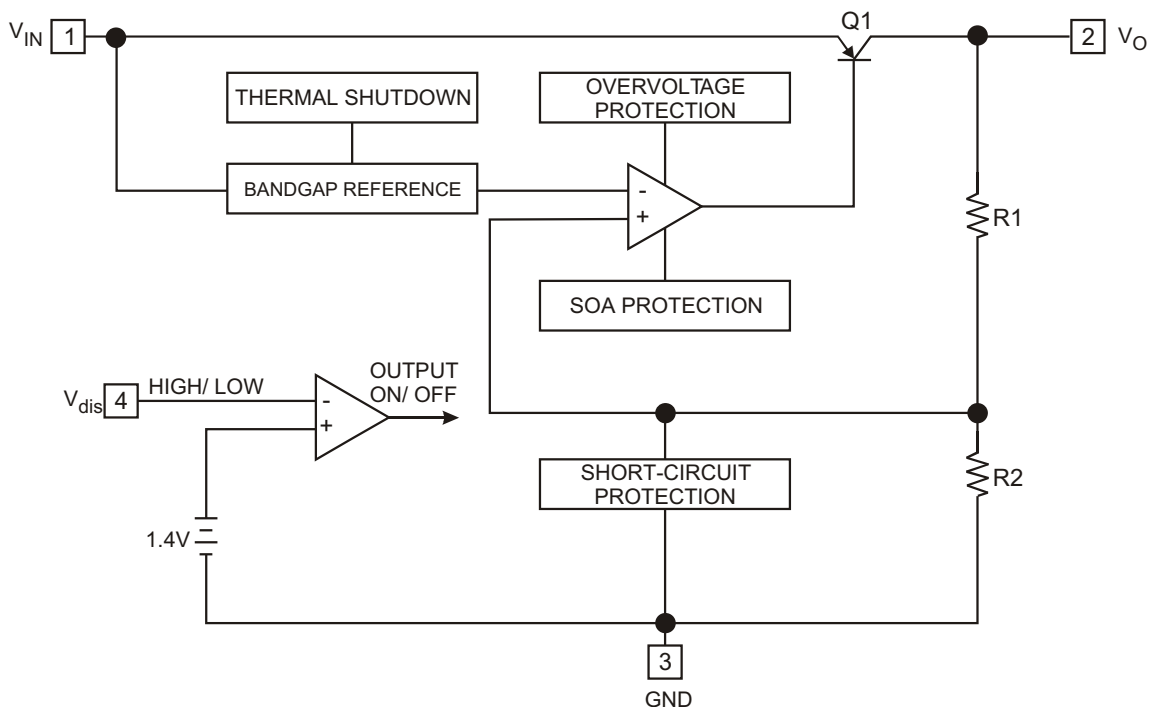
◆ **Electrical Characteristics** ($V_{IN} = 5V$, $I_O = 1.0A$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	3.22	3.3	3.38	V
Load Regulation	R_{load}	$5mA < I_O < 1A$	-	0.1	2.0	%
Line Regulation	R_{line}	$6V < V_{IN} < 12V$	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	$I_O = 1A$	-	-	0.5	V
Disable Voltage High	V_{dis-H}	Output Active	2.0	-	-	V
Disable Voltage Low	V_{dis-L}	Output Disabled	-	-	0.8	V
Disable Input Current High	I_{dis-H}	$V_{dis} = 2.7V$	-	-	20	μA
Disable Input Current Low	I_{dis-L}	$V_{dis} = 0.4V$	-	-	-0.4	mA
Quiescent Current	I_Q	$I_O = 0A$	-	-	10	mA

Note:

1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
 - Pneumatic heat sink fixture.
 - Clamping pressure 60psi through 12mm diameter cylinder.
 - Thermal grease applied between PKG and heat sink fixture.

◆ **BLOCK DIAGRAM(POSITIVE LOGIC)**



◆ TYPICAL PERFORMANCE CHARACTERISTICS

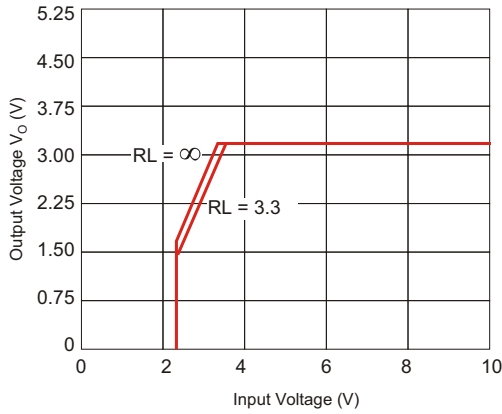


Figure 1. Output Voltage vs. Input Voltage

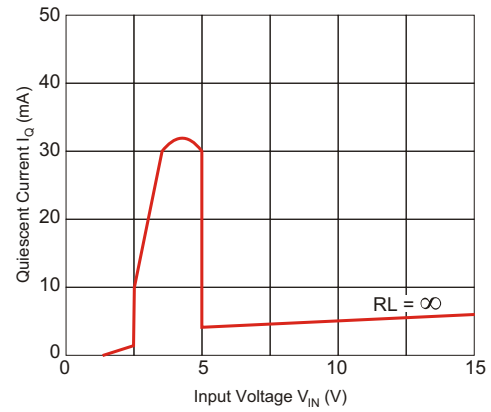


Figure 2. Quiescent Current vs. Input Voltage

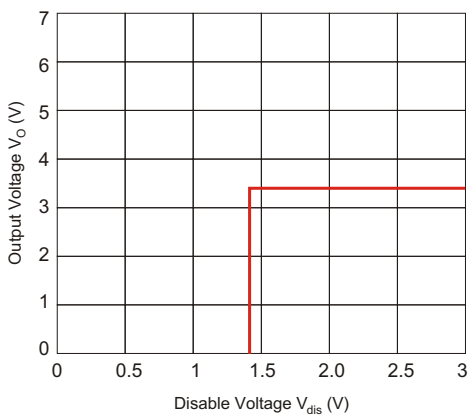


Figure 3. Output Voltage vs. Disable Voltage

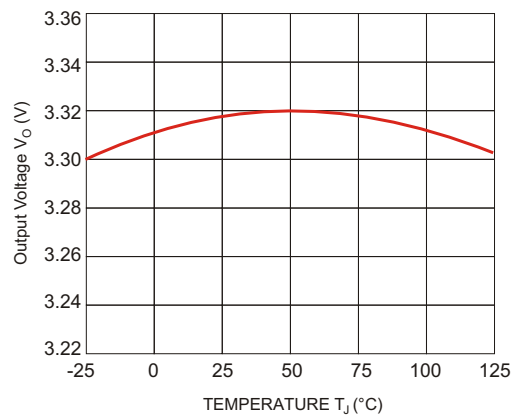


Figure 4. Output Voltage vs. Temperature (T_J)

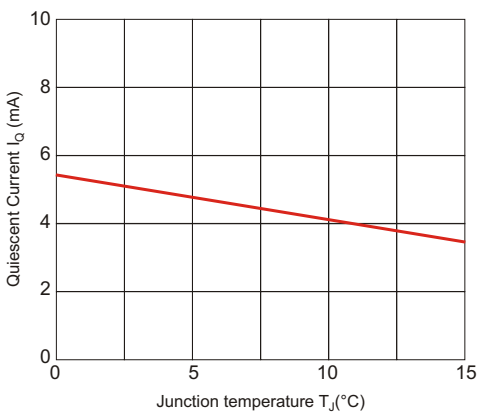


Figure 5. Quiescent Current vs. Temperature(T_J)

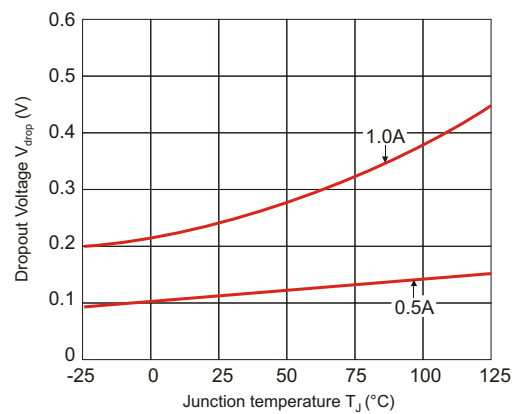


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ **TYPICAL PERFORMANCE CHARACTERISTICS**

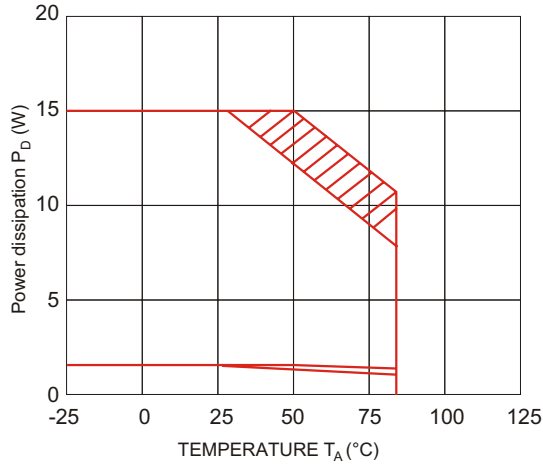
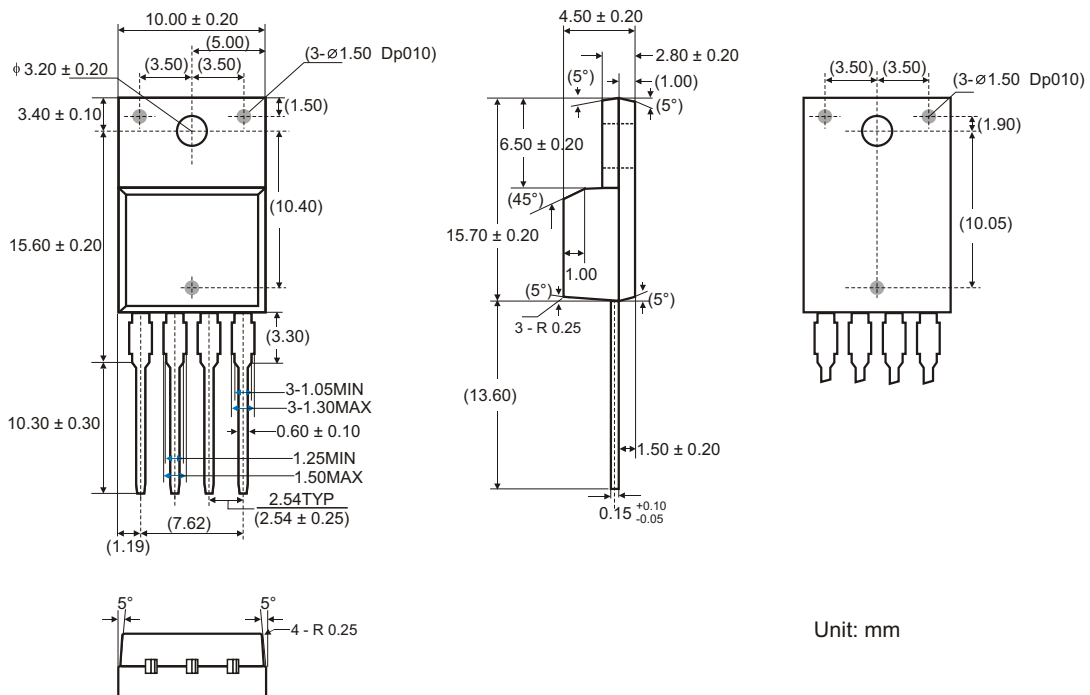
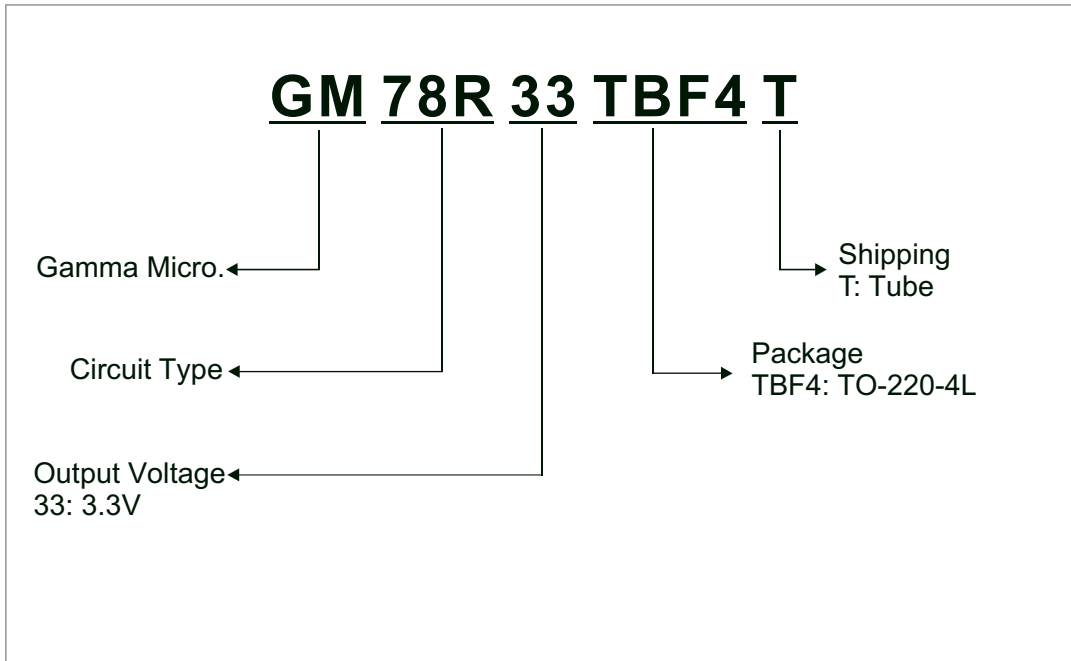




Figure 7. Power Dissipation vs. Temperature(T_A)

◆ **TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS**



◆ ORDERING NUMBER



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