➢ Features

- Output Current up to 1.0A
- Fixed Output Voltages of 5V, 6V, 8V, 9V, 12V, 15V and 18V
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- Output Transistor Safe Area Protection
- Package：TO252-2L, TO220-3L
- Low Load Regulation
- Stable Performance in High Temperature
- Output Voltage Accuracy: Tolerance ±4%

➢ General Description

The AF78XX series are three terminal positive voltage regulators designed for a wide variety of applications including local, on-card regulation.

The AF78XX series are complete with internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking is provided, these regulators can deliver output currents up to 1A.

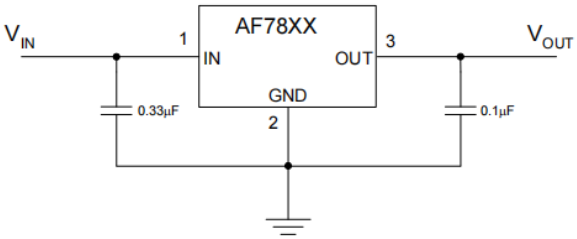
➢ Ordering Information

Device	Package	Shipping
AF78XXGT8	TO-252-2L	2500/Reel
AF78XXGT4	TO-220-3L	50/Tube

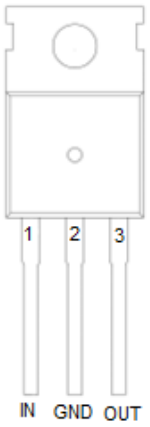
➢ Applications

- Hight Efficiency Linear Regular
- Post Regulation for Switching Supply
- Microprocess or Power Supply
- Mother Board

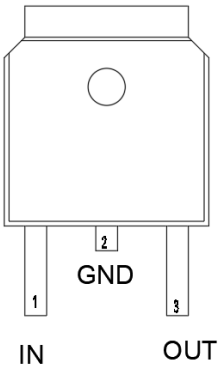
➢ Typical Applications



➢ Pin Configuration

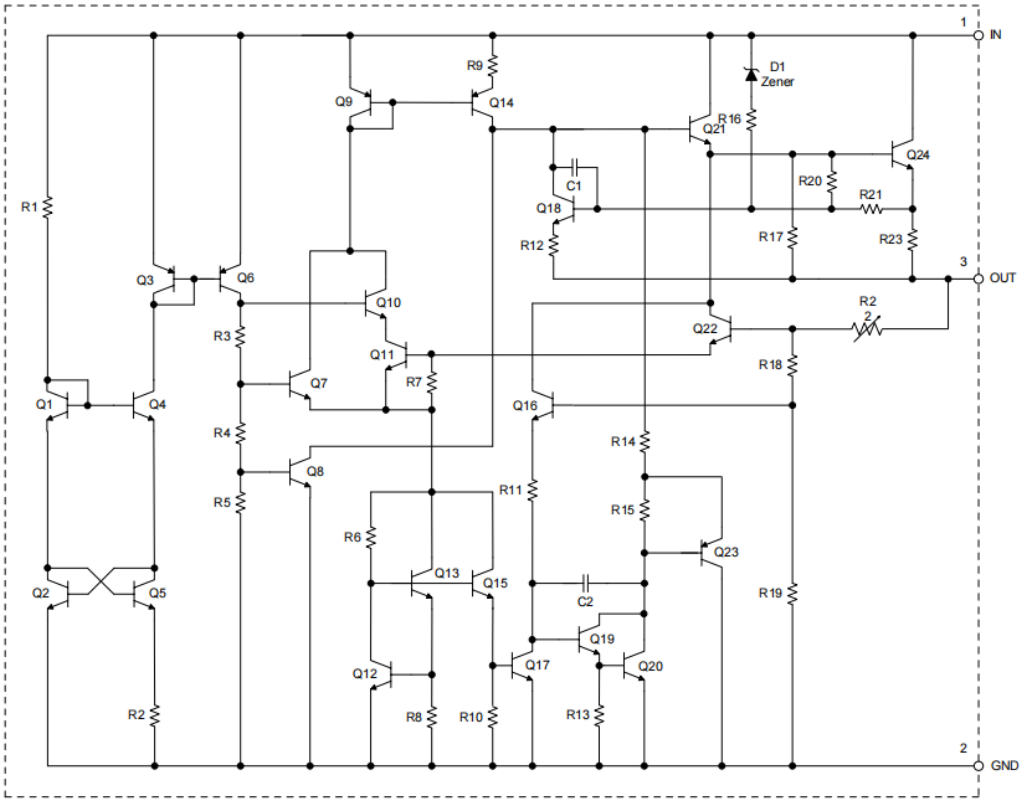


TO-220-3L



TO-252-2L

➢ Block Diagram



➢ Pin Descriptions

Pin NO.	Pin Name	Function
1	IN	Voltage Input
2	GND	Ground
3	OUT	Voltage Output

➢ Absolute Maximum Rating Note1

Parameter	Symbol	Value		Unit
Input supply voltage	V_{in}	36		V
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260		℃
Power Dissipation	P_D	Internally Limited		mA
Thermal Resistance from Junction to Air	$R_{\theta JA}$	TO-220-3	60	℃/W
		TO-252-2	100	
Storage Temperature Range	T_{STG}	-65 to +150		℃/W
Maximum junction temperature	T_J	150		℃

Note(1): Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

➢ Recommended Operating Condition

Parameter	Symbol	Type	Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}	AF7805			25	V
		AF7806			26	V
		AF7808			28	V
		AF7809			29	V
		AF7812			32	V
		AF7815			32	V
		AF7818			32	V
Operating Junction Temperature Range	T_J		-40		125	℃

➢ Electrical Characteristics

AF7805 (@ V_{IN} = 10V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	4.9	5	5.1	V
		I_O = 5mA to 1A, P_O≤15W V_I = 7.5V to 20V	4.8		5.2	
Line Regulation	Regline	T_J=+25℃,V_I = 10V to 20V,I_O=500mA		25	50	mV
Load Regulation	Regload	T_J=+25℃， V_I =10V, I_{OUT} = 5mA to 1A,		20	50	mV
Quiescent Current	I_Q	T_J = +25℃		3.2	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 8V to 25V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		0.8		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =8V to 18.5V，I_O=500mA		70		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		10		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.23		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 10V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

AF7806 (@ V_{IN} = 11V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	5.88	6	6.12	V
		I_O = 5mA to 1A, P_O≤15W V_I = 10V to 21V	5.76		6.24	
Line Regulation	Regline	T_J=+25℃,V_I = 10V to 21V,I_O=500mA		25	60	mV
Load Regulation	Regload	T_J=+25℃， V_I =11V, I_{OUT} = 5mA to 1A,		20	60	mV
Quiescent Current	I_Q	T_J = +25℃		3.2	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 10V to 25V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		0.8		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =9.5V to 19.5V，I_O=500mA		65		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		10		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 10V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

AF7808 (@ V_{IN} = 14V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	7.84	8	8.16	V
		I_O = 5mA to 1A, P_O≤15W V_I = 10.6V to 23V	7.7		8.3	
Line Regulation	Regline	T_J=+25℃,V_I = 10.6V to 23V,I_O=500mA		25	75	mV
Load Regulation	Regload	T_J=+25℃， V_I =14V, I_{OUT} = 5mA to 1A,		25	75	mV
Quiescent Current	I_Q	T_J = +25℃		3.2	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 10.6V to 25V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		0.8		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =11.5V to 21.5V， I_O=500mA		62		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		10		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 14V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

AF7809 (@ V_{IN} = 15V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	8.82	9	9.18	V
		I_O = 5mA to 1A, P_O≤15W V_I = 11.5V to 23V	8.65		9.35	
Line Regulation	Regline	T_J=+25℃,V_I =11.5V to 23V,I_O=500mA		25	90	mV
Load Regulation	Regload	T_J=+25℃， V_I =15V, I_{OUT} = 5mA to 1A,		25	100	mV
Quiescent Current	I_Q	T_J = +25℃		3.2	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 11.5V to 23V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		0.8		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz Vi=11.5V to 21.5V，I_O=500mA		61		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		10		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 15V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

AF7812 (@ V_{IN} = 19V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	11.75	12	12.25	V
		I_O = 5mA to 1A, P_O≤15W V_I =14.8V to 27V	11.5		12.5	
Line Regulation	Regline	T_J=+25℃,V_I = 14.8V to 27V,I_O=500mA		25	120	mV
Load Regulation	Regload	T_J=+25℃， V_I =19V, I_{OUT} = 5mA to 1A,		40	120	mV
Quiescent Current	I_Q	T_J = +25℃		3.4	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 14.8V to 30V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		0.96		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =15V to 25V，I_O=500mA		60		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		11		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 11V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

AF7815 (@ V_{IN} =23V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	14.7	15	15.3	V
		I_O = 5mA to 1A, P_O≤15W V_I = 17.9V to 30V	14.4	15	15.6	
Line Regulation	Regline	T_J=+25℃,V_I = 17.9V to 30V,I_O=500mA		35	150	mV
Load Regulation	Regload	T_J=+25℃， V_I = 23V, I_{OUT} = 5mA to 1A,		70	150	mV
Quiescent Current	I_Q	T_J = +25℃		3.4	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 17.9V to 30V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		1.2		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =18.5V to 28.5V， I_O=500mA		58		dB
Dropout Voltage	V_{DROP}	I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		11		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 21V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

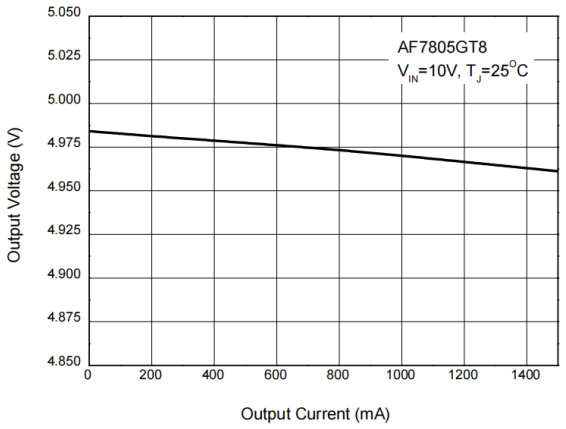
AF7818 (@ V_{IN} =27V, I_{OUT} = 1A, T_J = -40 to +125°C, unless otherwise specified.)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = +25℃	17.64	18	18.36	V
		I_O = 5mA to 1A, P_O≤15W V_I =21V to 33V	17.3		18.7	
Line Regulation	Regline	T_J=+25℃,V_I = 21V to 33V,I_O=500mA		45	180	mV
Load Regulation	Regload	T_J=+25℃， V_I =27V, I_{OUT} = 5mA to 1A		85	180	mV
Quiescent Current	I_Q	T_J = +25℃		3.6	6	mA
Quiescent Current Change	ΔI_Q	I_O = 5mA to 1A		0.08	0.5	mA
		T_J=+25℃,V_I = 21V to 33V,I_O=500mA		1.0	2.0	
Output voltage Temperature Coefficient	ΔVo/ΔT	-		1.44		mV/℃
	(ΔVo/ΔVo)/ΔT	-		80		ppm/℃
Output Noise Voltage	NO	f=10Hz ～100KHz ,T_A =+25°C		42		μV/Vo
Ripple Rejection	PSRR	f=120Hz V_I =22V to 32V， I_O=500mA		57		dB
Dropout Voltage	V_{DROP}	ΔVo =1%;I_O=1A, T_J=+25°C		2		V
Output Resistance	R_O	f=1KHz		11		mΩ
Short Circuit Current	I_{SC}	T_J = +25℃ , V_I = 35V		0.25		A
Peak Current	I_{PK}	T_J = +25℃, V_I = 11V		2.2		A
Thermal Resistance	$R_{\theta JC}$	TO-220-3		9		°C/W
		TO-252-2		16		°C/W

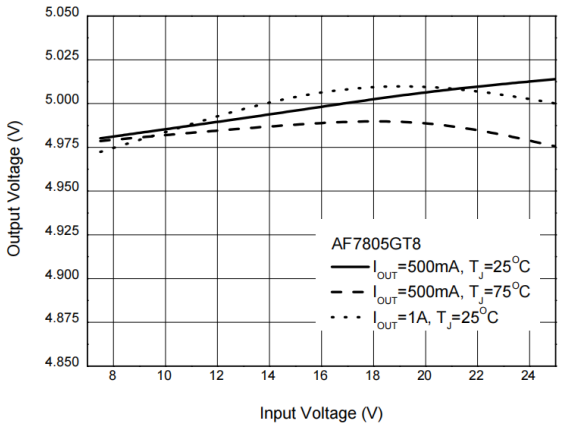
➢ Typical Performance Characteristics

T_J = 25°C, unless otherwise specified.

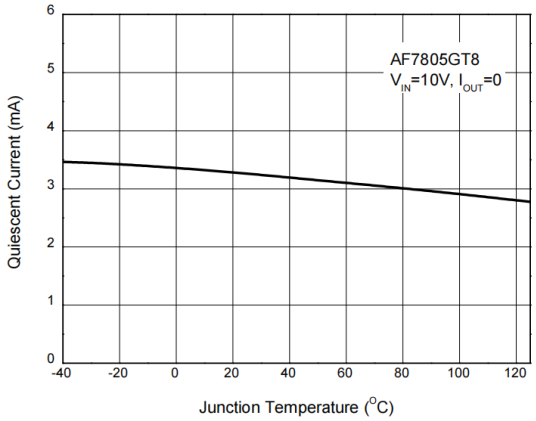
Output Voltage vs. Output Current



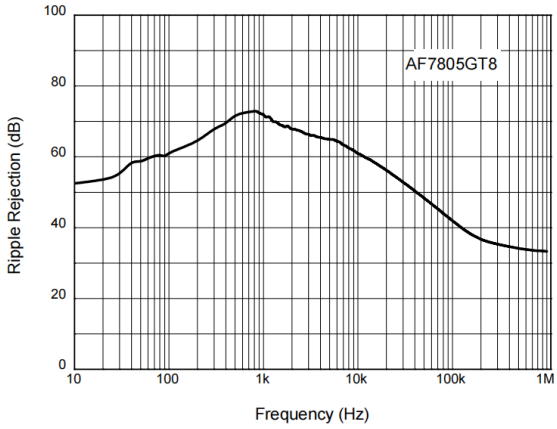
Output Voltage vs. Input Voltage



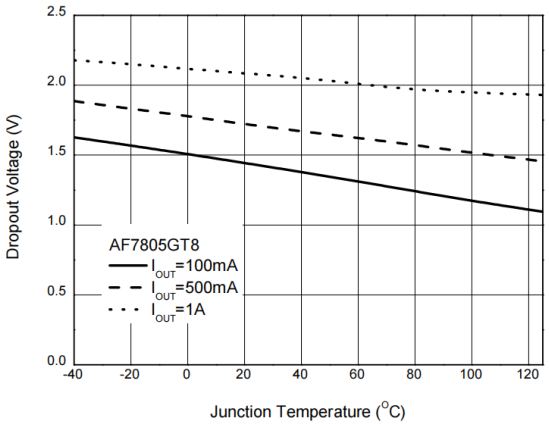
Quiescent Current vs. Junction Temperature



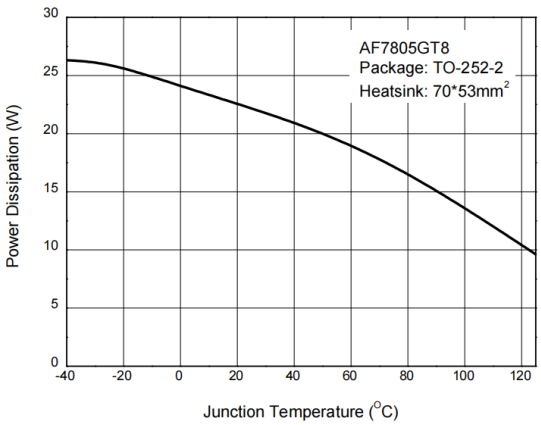
Ripple Rejection vs. Frequency



Dropout Voltage vs. Junction Temperature

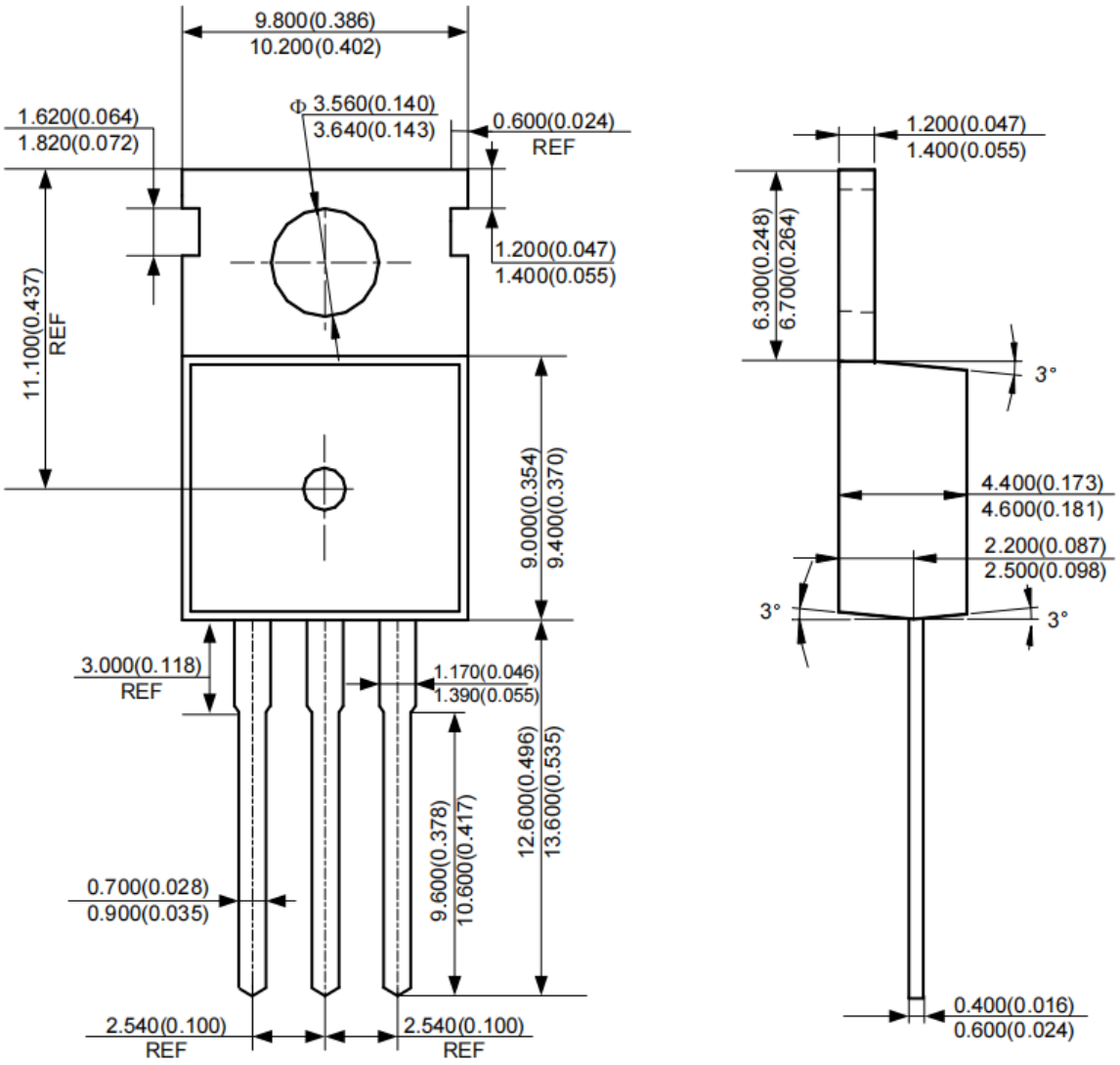


Power Dissipation vs. Junction Temperature

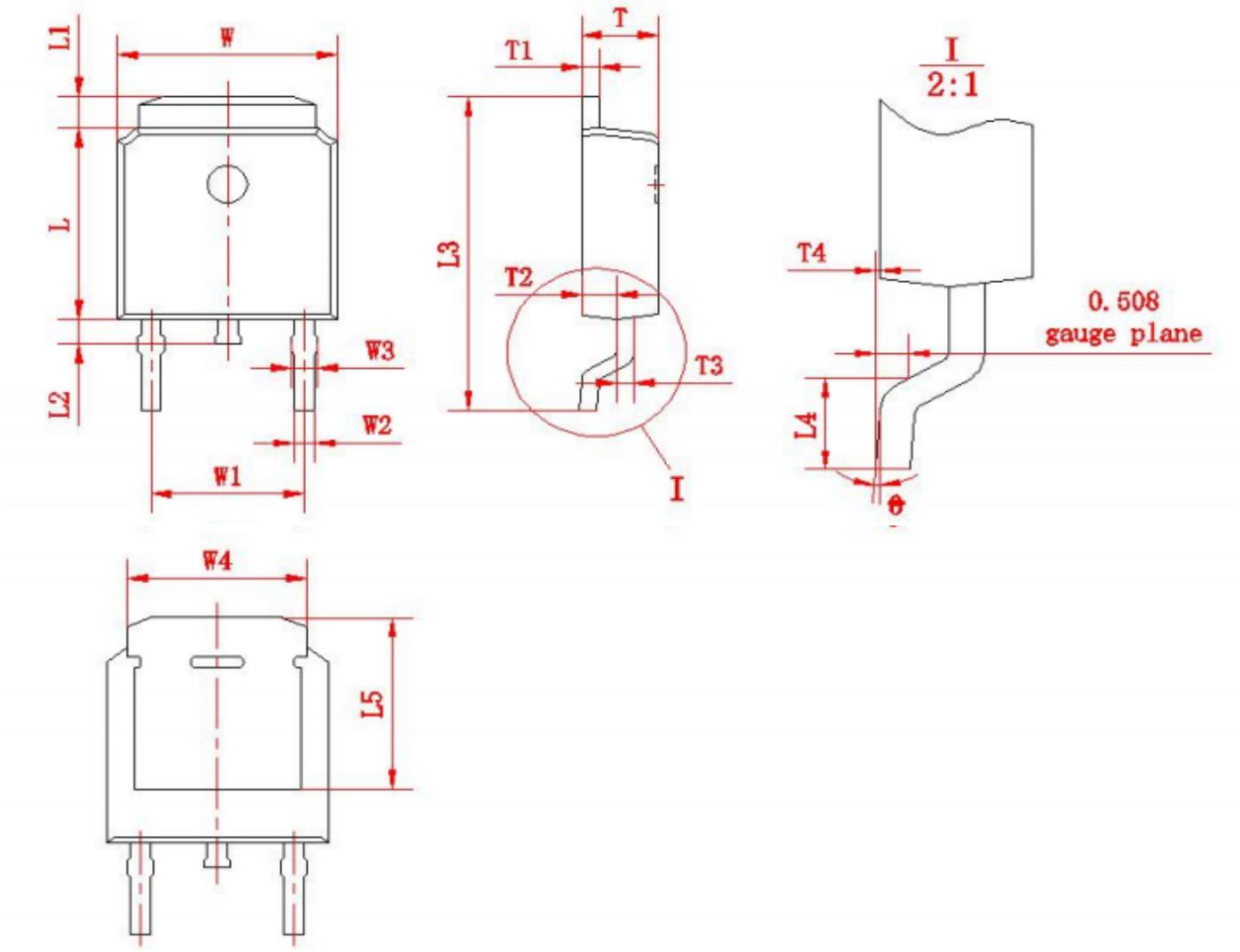


➢ Package Information

TO-220-3L



TO-252-2L



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max		Min	Max
W	6.50	6.70	L1	0.8	1.2	T1	0.48	0.58
W1	(4.572)		L2	0.60	1.00	T2	0.95	1.15
W2	0.60	0.80	L3	9.70	10.30	T3	0.48	0.58
W3	0.68	0.88	L4	1.30	1.70	T4	0	0.15
W4	(5.3)		L5	(5.20)		θ	0°	8°
L	6.00	6.20	T	2.20	2.40			

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