Absolute Maximum Ratings (Voltage relative to GND, @T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Input Supply Voltage	V_{IN}	-0.3 to 100	V
Continuous Input & Output Current	I_{IN}, I_{OUT}	750	mA
Peak Pulsed Input & Output Current	I_{IM}, I_{OM}	2	A
Maximum Voltage applied to V_{OUT}	$V_{OUT(max)}$	Smaller of V_{IN}+12V or 18V	V

Maximum Current at V_{IN} = 48V (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Continuous Output Current	(Note 7)	I_{OUT}	60	mA
Pulsed Output Current	(Note 8)	I_{OM}	960	mA
	(Note 9)		200	

Thermal Characteristics

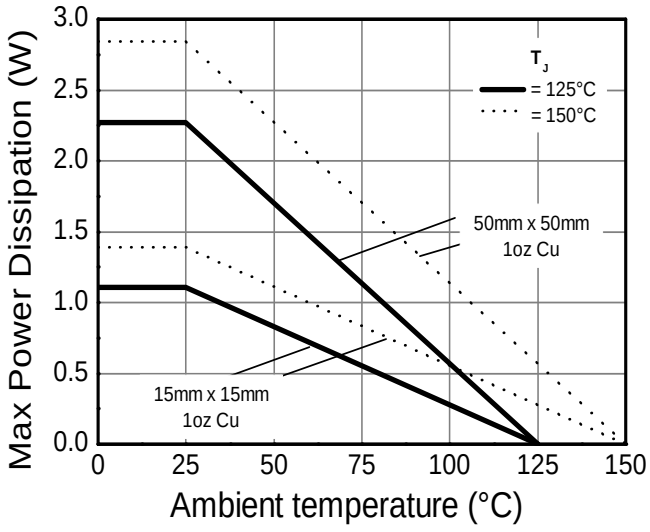
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.3	W
	(Note 6)		1.1	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	44	°C/W
	(Note 6)		90	
Thermal Resistance, Junction to Lead	(Note 10)	$R_{\theta JL}$	8.4	
Thermal Resistance, Junction to Case	(Note 10)	$R_{\theta JC}$	14.6	
Recommended Operating Junction Temperature Range		T_J	-40 to +125	°C
Maximum Operating Junction and Storage Temperature Range		T_J , T_{STG}	-65 to +150	

ESD Ratings (Note 11)

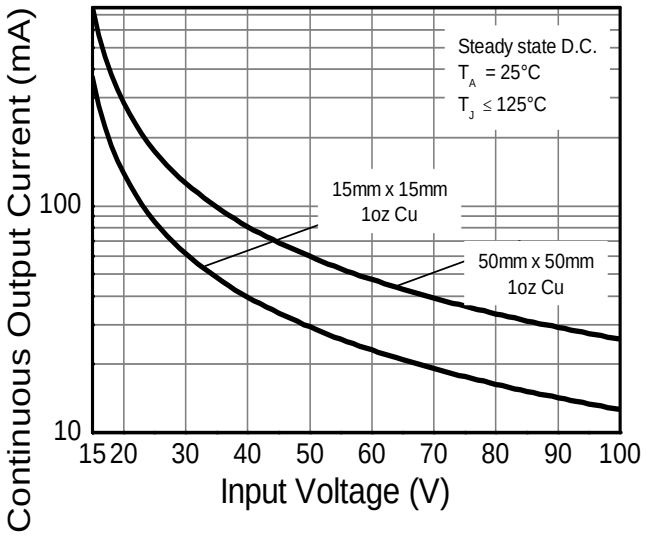
Characteristics	Symbols	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed V_{IN} pad on 50mm x 50mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
6. Same as note 5, except mounted on 15mm x 15mm 1oz copper.
7. Same as note 5, whilst operating at V_{IN} = 48V. Refer to Safe Operating Area for other Input Voltages.
8. Same as note 5, except measured with a single pulse width = 100µs and V_{IN} = 48V.
9. Same as note 5, except measured with a single pulse width = 10ms and V_{IN} = 48V.
10. $R_{\theta JL}$ = Thermal resistance from junction to solder-point (on the exposed V_{IN} pad).
    $R_{\theta JC}$ = Thermal resistance from junction to the top of case.
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

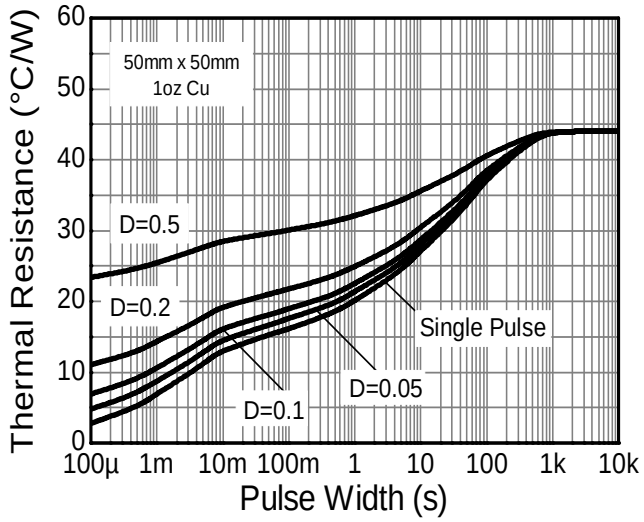
Thermal Characteristics and Derating Information



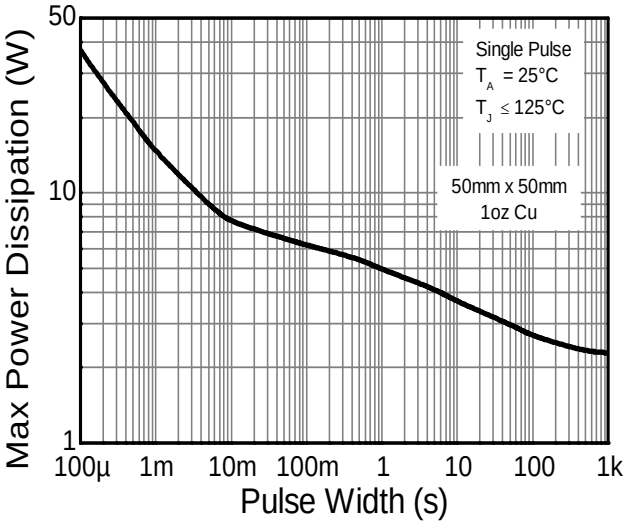
Derating Curve



Safe Operating Area



Transient Thermal Impedance



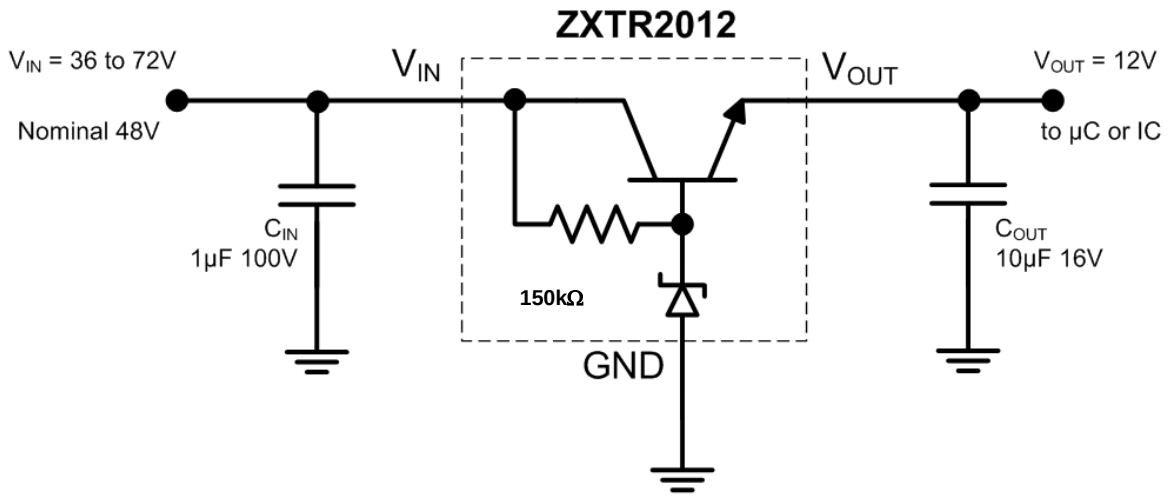
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Output Voltage (Note 12)	V_{OUT}	10.8	12	13.2	V	V_{IN} = 48V, I_{OUT} = 15mA
Line Regulation (Notes 12 & 13)	ΔV_{OUT}	—	240	750	mV	V_{IN} = 15 to 72V , I_{OUT} = 15mA
Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	—	8.0	—	mV/°C	T_J = -40°C to +125°C V_{IN} = 48V, I_{OUT} = 15mA
Load Regulation (Notes 12 & 14)	ΔV_{OUT}	—	-450 -600	-600 -750	mV	I_{OUT} = 0.1 to 30mA, V_{IN} = 48V I_{OUT} = 0.1 to 100mA, V_{IN} = 48V
Minimum Value of Input Voltage Required to Maintain Line Regulation	$V_{IN(MIN)}$	15	—	—	V	—
Quiescent Current	I_Q	—	240 590	400 900	µA	V_{IN} = 48V, I_{OUT} = 10µA V_{IN} = 100V, I_{OUT} = 10µA
Power Supply Rejection Ratio	$\Delta V_{IN}/\Delta V_{OUT}$	—	45	—	dB	C_{OUT} = 100nF, I_{OUT} = 15mA, V_{OUT} = 12V, V_{IN} =15 to 100V, f=100Hz

Notes: 12. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%
13. Line regulation $\Delta V_{OUT} = V_{OUT}(@\ V_{IN} = 72V) – V_{OUT}(@\ V_{IN} = 15V)$
14. Load regulation $\Delta V_{OUT} = V_{OUT}(@\ I_{OUT} = 30mA) – V_{OUT}(@\ I_{OUT} = 0.1mA)$
$\Delta V_{OUT} = V_{OUT}(@\ I_{OUT} = 100mA) – V_{OUT}(@\ I_{OUT} = 0.1mA)$

Typical Application Circuit

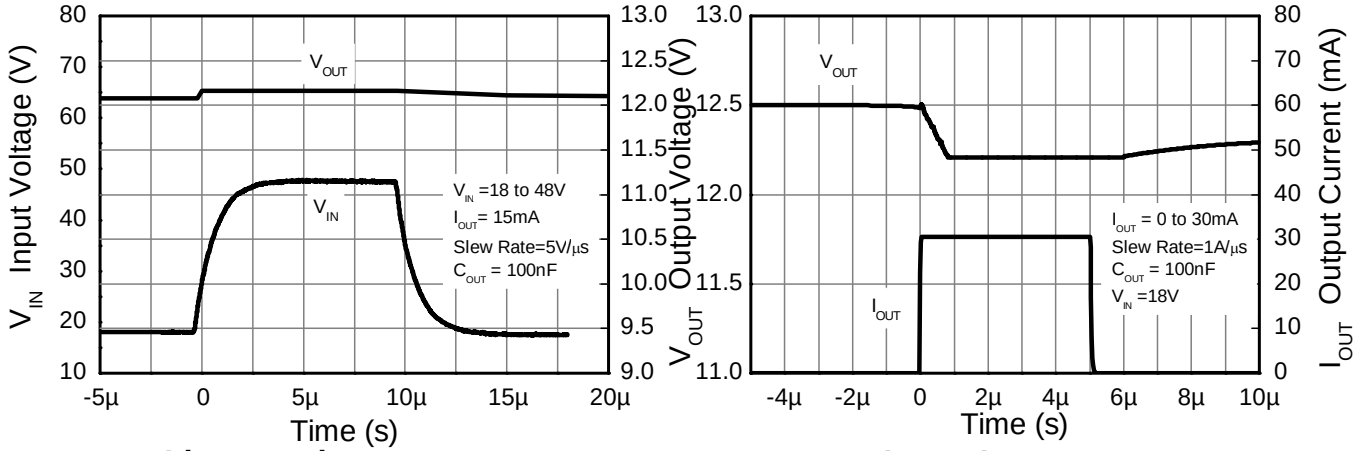


Example of an 12V regulated supply from a nominal 48V for powering a Controller IC.

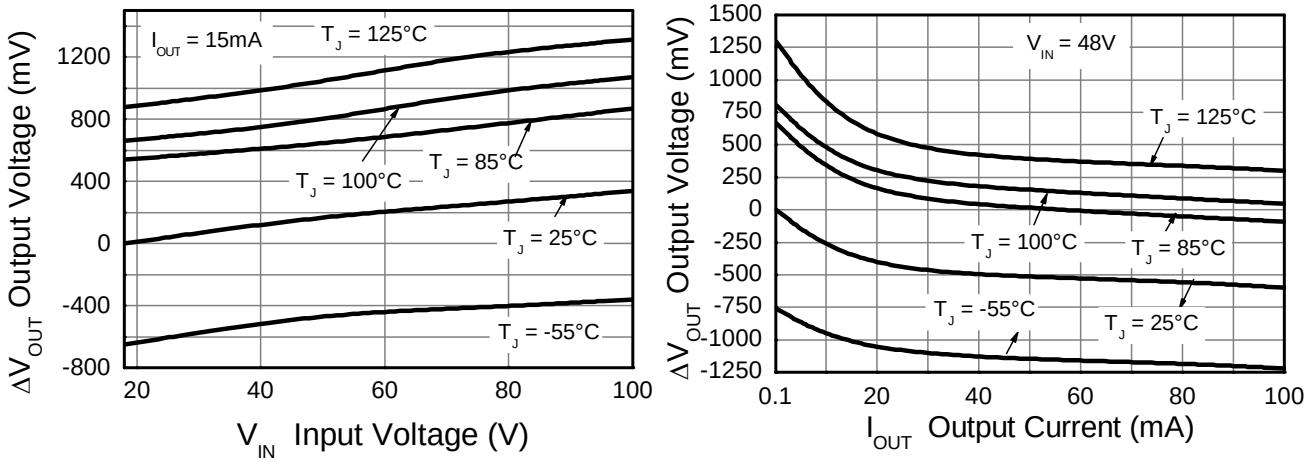
Pin Functions

Pin Name	Pin Function	Notes
V_{IN}	Input Supply	Input voltage can vary from -0.3V to 100V with respect to GND; for V_{OUT} regulated then 15V ≤ V_{IN} ≤ 100V. It is recommended to connect a 1µF capacitor to GND.
GND	Power Ground	This pin should be tied to the system ground.
V_{OUT}	Voltage Output	Outputs a regulated 12V when 15V ≤ V_{IN} ≤ 100V. When V_{IN} < 15V, then V_{OUT} maximum = V_{IN} – 1.5V. The pin can be pulled high to a maximum of +18V with respect to GND, or +12V with respect to V_{IN}, whichever is lower. It is recommended to connect a 10µF capacitor to GND and a minimum of 10µA to be drawn from V_{OUT} to maintain regulation.

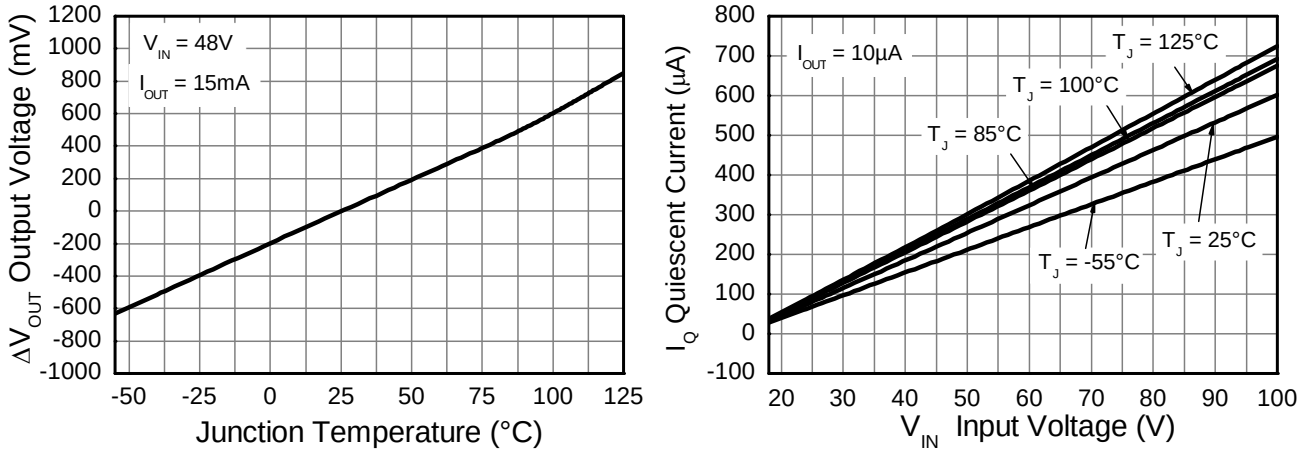
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Line transient response **Load transient response**



Line Regulation (Note 15) **Load Regulation (Note 16)**

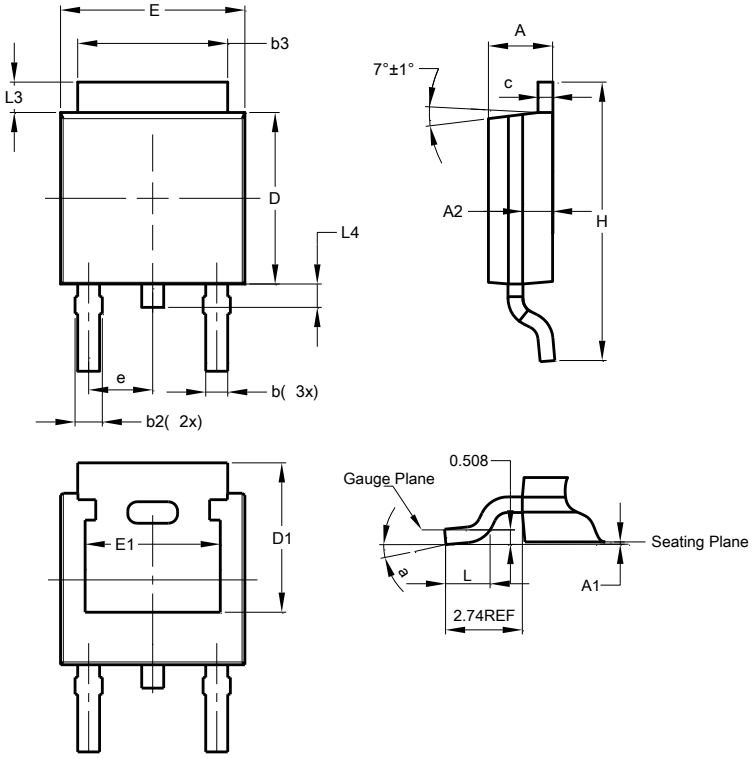


Temperature Coefficient (Note 17) **Quiescent Current**

Notes: 15. Line regulation $\Delta V_{OUT} = V_{OUT} – V_{OUT}$(@ V_{IN} = 15V, I_{OUT} = 15mA, T_J = +25°C)
16. Load regulation $\Delta V_{OUT} = V_{OUT} – V_{OUT}$(@ V_{IN} = 48V, I_{OUT} = 0.1mA, T_J = +25°C)
17. Temperature Coefficient $\Delta V_{OUT} = V_{OUT} – V_{OUT}$(@ V_{IN} = 48V, I_{OUT} = 15mA, T_J = +25°C)

Package Outline Dimensions

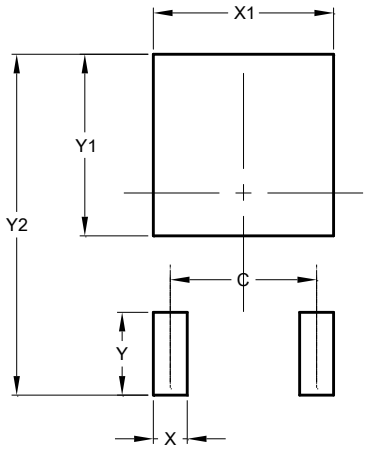
Please see http://www.diodes.com/package-outlines.html for the latest version.



TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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