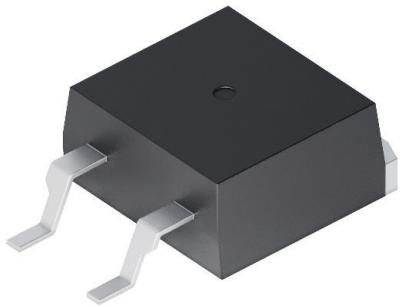
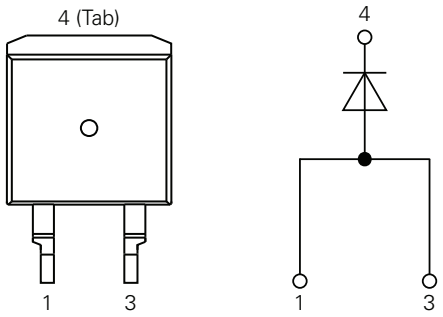
DMA30IM1600PZ

1600 V, 30 A Standard Rectifier

RoHS



Pinout Diagram TO-263 (D²PAK-HV)



1: Anode; **3:** Anode ; **4:** Cathode

Description

This 1600 V, 30 A high-performance, standard single diode provides a simplified system design packaged in TO-263 2-lead HV.

This device belongs to the rectifier diode series, featuring planar passivated chips and low leakage current. These features make it suitable for reliable rectification in applications such as power supplies and battery chargers.

Littelfuse rectifier diodes can be integrated with other power semiconductors to provide complete power solutions for a wide range of applications.

Features

- Planar passivated chips
- Low leakage current of 40 µA
- Low V_F of 1.26 V
- Improved thermal behavior

Applications

- Uninterruptible power supply
- Power supplies
- Battery chargers

Package TO-263 (D²PAK-HV)

- Industry standard outline
- High creepage distance between terminals
- RoHS compliant
- Epoxy meets UL 94V-0

Product Summary

Characteristic	Value	Unit
V_{RRM}	1600	V
$I_{F(AV)}$	30	A
V_F	1.26	V

Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
V_{RSM}	Non-repetitive Reverse Blocking Voltage	T_{vj} = 25 °C	1700	V
V_{RRM}	Repetitive Reverse Blocking Voltage	T_{vj} = 25 °C	1600	V
$I_{F(AV)}$	Average Forward Current	T_c = 140 °C, T_{vj} = 175 °C; rectangular d = 0.5	30	A
I_{FSM}	Forward Surge Current	t = 10 ms; (50 Hz), sine, T_{vj} = 45 °C	300	A
		t = 8.3 ms; (60 Hz), sine, V_R = 0 V	325	
		t = 10 ms; (50 Hz), sine, T_{vj} = 150 °C	255	
		t = 8.3 ms; (60 Hz), sine, V_R = 0 V	275	
I^2t	Value for fusing	t = 10 ms; (50 Hz), sine, T_{vj} = 45 °C	450	A^2s
		t = 8.3 ms; (60 Hz), sine, V_R = 0 V	440	
		t = 10 ms; (50 Hz), sine, T_{vj} = 150 °C	325	
		t = 8.3 ms; (60 Hz), sine, V_R = 0 V	315	
T_{stg}	Storage Temperature Range	–	–55 to +150	°C
T_{vj}	Virtual Junction Temperature Range	–	–55 to +175	°C
P_{tot}	Total Power Dissipation	T_c = 25 °C	210	W

Thermal Specifications

Symbol	Characteristic	Value			Units
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	–	–	0.7	K/W
$R_{th(c-h)}$	Thermal Resistance, Case to Heatsink	–	0.25	–	K/W

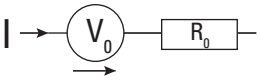
Electrical Characteristics

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
I_R	Reverse Leakage Current	T_{vj} = 25 °C	V_R = 1600 V	–	–	40	µA
		T_{vj} = 150 °C		–	–	1.5	mA
V_F	Forward Voltage	T_{vj} = 25 °C	I_F = 30 A	–	–	1.29	V
			I_F = 60 A	–	–	1.60	
		T_{vj} = 150 °C	I_F = 30 A	–	–	1.26	
			I_F = 60 A	–	–	1.65	
V_{FO}	Threshold Voltage	T_{vj} = 175 °C		–	–	0.82	V
r_F	Slope Resistance	T_{vj} = 175 °C		–	–	14.1	mΩ
C_j	Junction Capacitance	V_R = 400 V, f = 1 MHz, T_{vj} = 25 °C		–	10	–	pF

Package TO-263 (D^3PAK-HV)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I_{RMS}	RMS Current	per terminal	–	–	35	A
T_{op}	Operating Temperature Range	–	–55 to +150			°C
F_C	Mounting Force with Clip	–	20	–	60	N
G	Weight	–	–	1.5	–	g
$d_{Spp/App}$	Creepage Distance on Surface/ Striking Distance through Air	terminal to terminal	4.2	–	–	mm
$d_{Spb/Apb}$		terminal to backside	4.7	–	–	mm

Equivalent Circuits for Simulation (T_{vj} = 175 °C)



Rectifier

Symbol	Characteristics	Value	Units
$V_{0\ max}$	Threshold Voltage	0.82	V
$R_{0\ max}$	Slope Resistance[1]	10.9	mΩ

Note 1: On die level

Characteristic Curves

Figure 1. Forward Characteristics

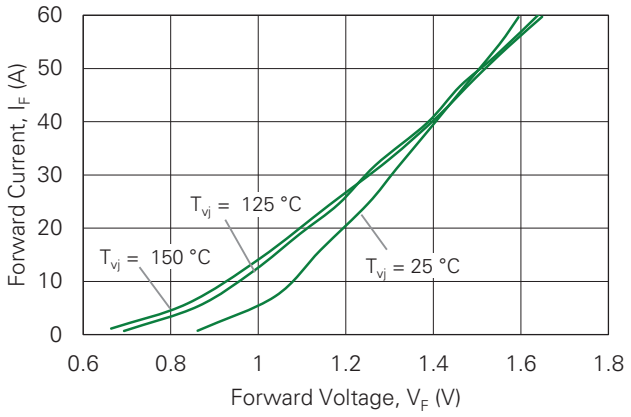


Figure 2. Surge Overload Current

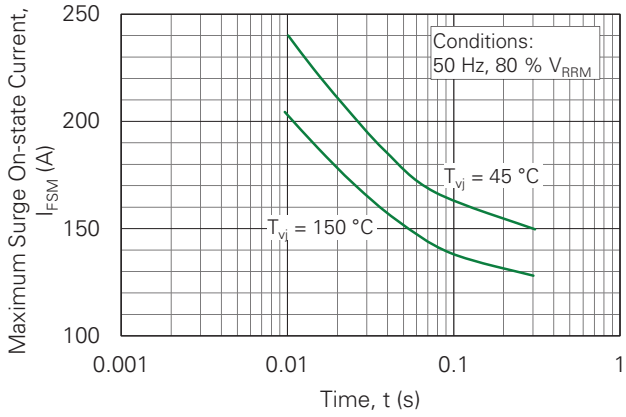


Figure 3. I^2t vs. Time per Diode

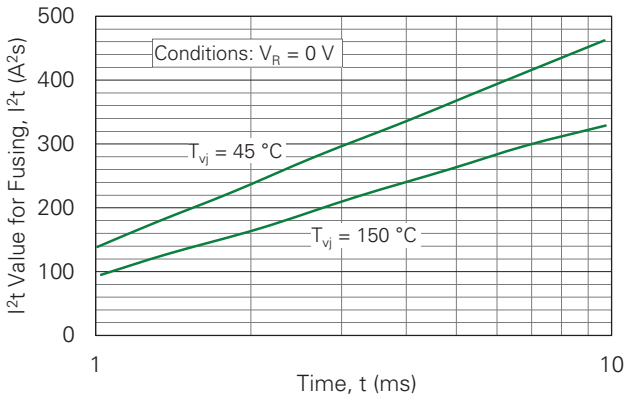


Figure 4a. Power Dissipation vs. Direct Output Current

Figure 4b. Power Dissipation vs. Ambient Temperature

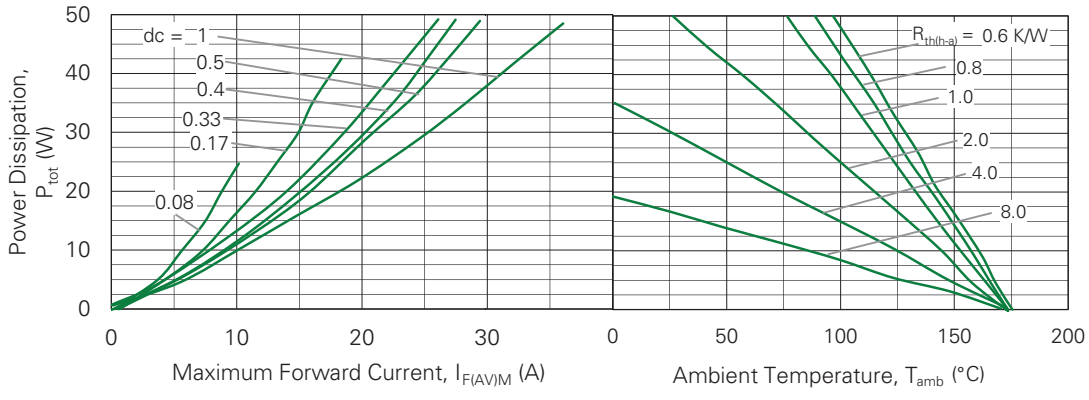


Figure 5. Maximum Forward Current vs. Case Temperature

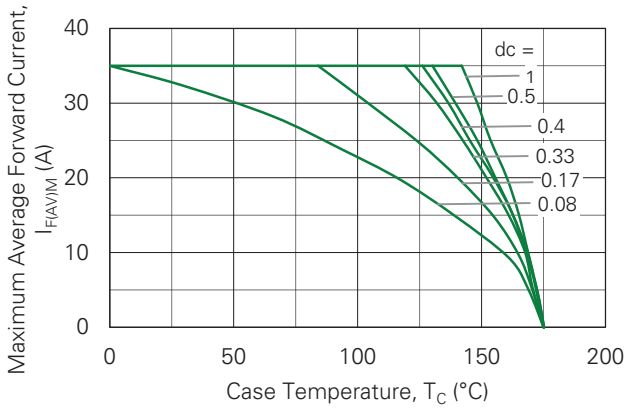
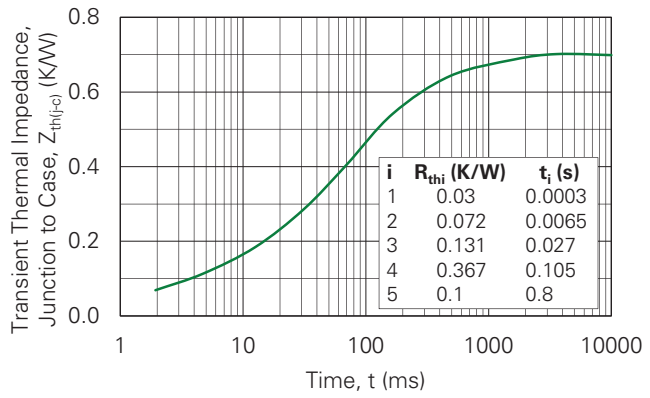
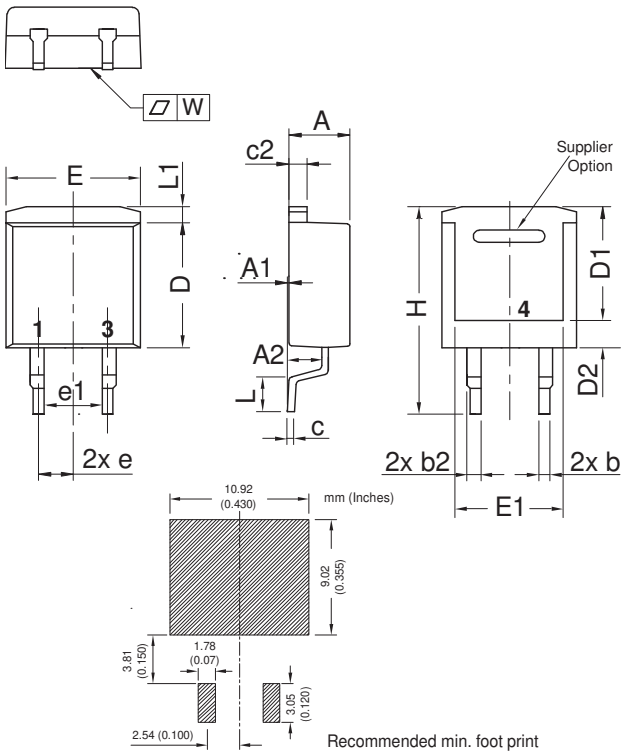


Figure 6. Transient Thermal Impedance, Junction to Case



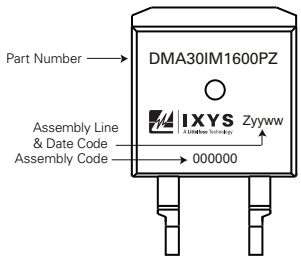
Part Outline Drawing TO-263 (D^2PAK-HV)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	4.3	4.7	0.169	0.185
A1	typ. 0.10		typ. 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.3		0.091	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

Note: All dimensions conform with and/or within JEDEC standard.

Part Numbering and Marking



D	=	Diode
M	=	Standard Rectifier
A	=	Up to 1800 V
30	=	Current Rating (A)
IM	=	Single Diode
1600	=	Reverse Voltage
PZ	=	TO-263AB (D^2PAK) (HV)

Packing Options

Part Number	Marking	Packing Mode	Quantity
DMA30IM1600PZ-TRL	DMA30IM1600PZ	Tape & Reel	800 pcs
DMA30IM1600PZ-TUB	DMA30IM1600PZ	Tube	50 pcs