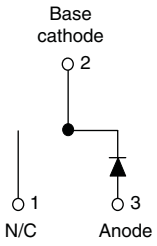
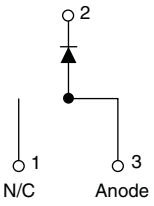
Hyperfast Rectifier, 8 A FRED Pt™

8ETH03SPbF **8ETH03-1PbF**



D²PAK



TO-262

FEATURES

- Hyperfast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for Q101 level

Available
RoHS* COMPLIANT

DESCRIPTION/APPLICATIONS

300 V series are the state of the art hyperfast recovery rectifiers designed with optimized performance of forward voltage drop and hyperfast recovery time.
The planar structure and the platinum doped life time control guarantee the best overall performance, ruggedness and reliability characteristics.
These devices are intended for use in the output rectification stage of SMPS, UPS, dc-to-dc converters as well as freewheeling diodes in low voltage inverters and chopper motor drives.
Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

PRODUCT SUMMARY	
t_{rr}	35 ns
$I_{F(AV)}$	8 A
V_R	300 V

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MAX.**	**UNITS**
Repetitive peak reverse voltage	V_{RRM}		300	V
Average rectified forward current	$I_{F(AV)}$	T_C = 155 °C	8	A
Non-repetitive peak surge current	I_{FSM}	T_C = 25 °C	100	
Operating junction and storage temperatures	T_J, T_{Stg}		- 65 to 175	°C

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Breakdown voltage, blocking voltage	V_{BR}, V_R	I_R = 100 µA	300	-	-	V
Forward voltage	V_F	I_F = 8 A	-	1.0	1.25	
		I_F = 8 A, T_J = 125 °C	-	0.83	1.00	
Reverse leakage current	I_R	V_R = V_R rated	-	0.02	20	µA
		T_J = 125 °C, V_R = V_R rated	-	6.0	200	
Junction capacitance	C_T	V_R = 300 V	-	31	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8	-	nH

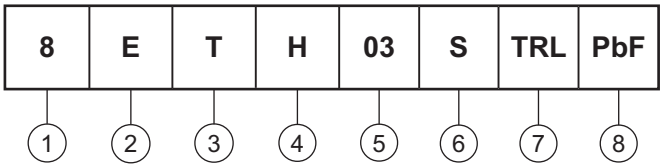
* Pb containing terminations are not RoHS compliant, exemptions may apply

DYNAMIC RECOVERY CHARACTERISTICS (T_C = 25 °C unless otherwise specified)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNITS**
Reverse recovery time	t_{rr}	I_F = 1 A, dI_F/dt = - 50 A/µs, V_R = 30 V		-	-	35	ns
		T_J = 25 °C	I_F = 8 A dI_F/dt = - 200 A/µs V_R = 200 V	-	27	-	
		T_J = 125 °C		-	40	-	
Peak recovery current	I_{RRM}	T_J = 25 °C		-	2.2	-	A
		T_J = 125 °C		-	5.3	-	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	30	-	nC
		T_J = 125 °C		-	106	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Maximum junction and storage temperature range	T_J, T_{Stg}		- 65	-	175	°C
Thermal resistance, junction to case per leg	R_{thJC}		-	1.45	2.5	°C/W
Thermal resistance, junction to ambient per leg	R_{thJA}	Typical socket mount	-	-	70	
Thermal resistance, case to heatsink	R_{thCS}	Mounting surface, flat, smooth and greased	-	0.2	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style D^2PAK	8ETH03S			
		Case style TO-262	8ETH03-1			

ORDERING INFORMATION TABLE

Device code



1 - Current rating (8 A)

2 - E = Single diode

3 - T = TO-220, D^2PAK

4 - H = Hyperfast rectifier

5 - Voltage rating (03 = 300 V)

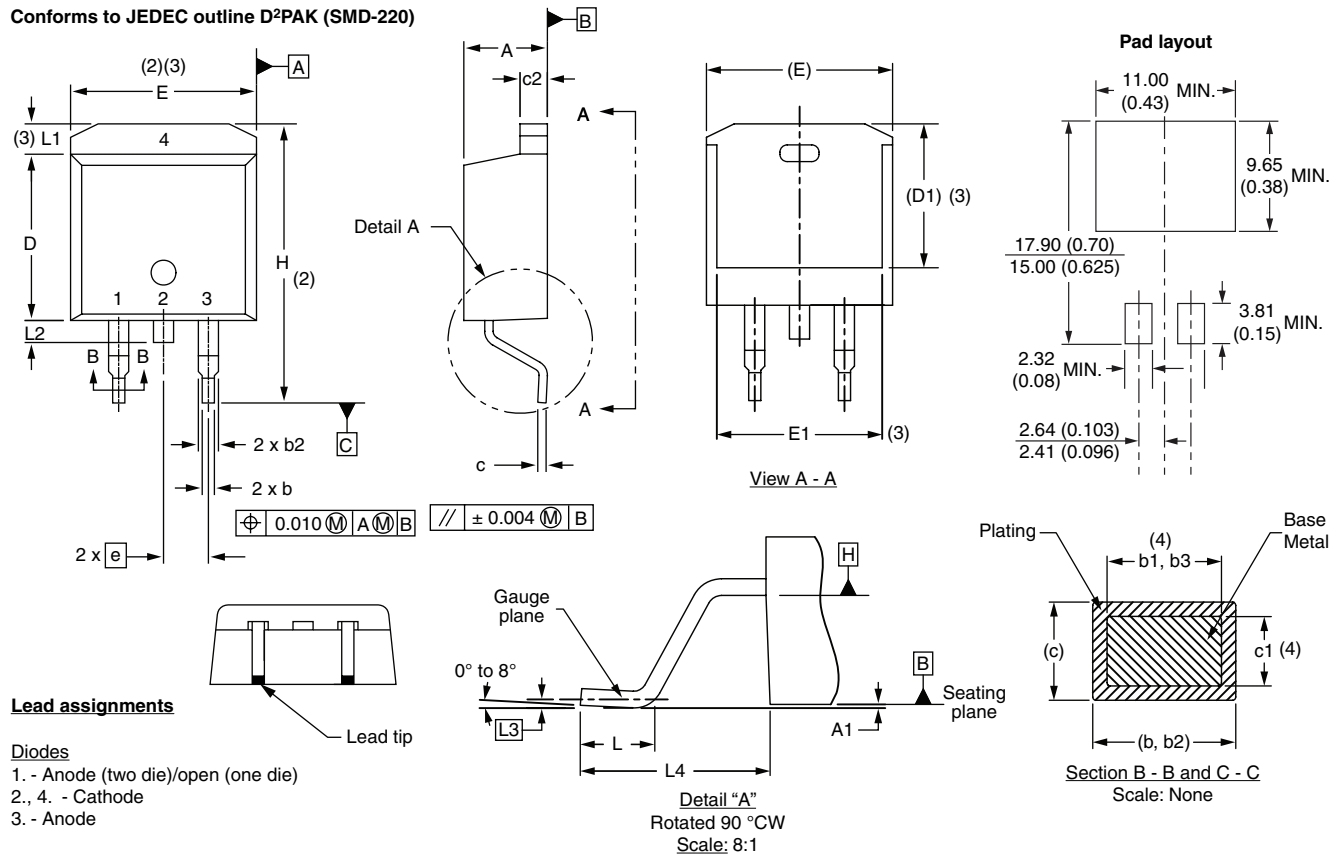
6 - • S = D^2PAK
• -1 = TO-262

7 - • None = Tube (50 pieces)
• TRL = Tape and reel (left oriented, for D^2PAK package)
• TRR = Tape and reel (right oriented, for D^2PAK package)

8 - • None = Standard production
• PbF = Lead (Pb)-free

D^2PAK, TO-262

DIMENSIONS FOR D^2PAK in millimeters and inches



Lead assignments

Diodes
1. - Anode (two die)/open (one die)
2., 4. - Cathode
3. - Anode

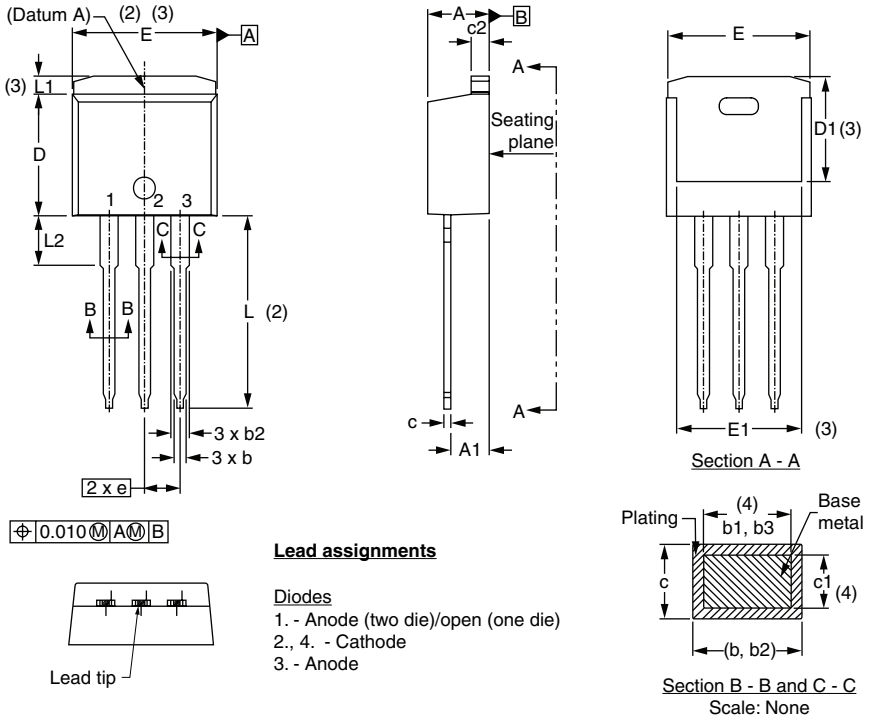
SYMBOL	MILLIMETERS		INCHES		NOTES		SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.				MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190			D1	6.86	-	0.270	-	3
A1	0.00	0.254	0.000	0.010			E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039			E1	6.22	-	0.245	-	3
b1	0.51	0.89	0.020	0.035	4		e	2.54 BSC		0.100 BSC		
b2	1.14	1.78	0.045	0.070			H	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110	
c	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065			L3	0.25 BSC		0.010 BSC		
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208	

Notes

(1) Dimensioning and tolerancing per ASME Y14.5 M-1994
(2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
(3) Thermal pad contour optional within dimension E, L1, D1 and E1
(4) Dimension b1 and c1 apply to base metal only
(5) Datum A and B to be determined at datum plane H
(6) Controlling dimension: inch
(7) Outline conforms to JEDEC outline TO-263AB

DIMENSIONS FOR TO-262 in millimeters and inches

Modified JEDEC outline TO-262



Lead assignments

Diodes
1. - Anode (two die)/open (one die)
2., 4. - Cathode
3. - Anode

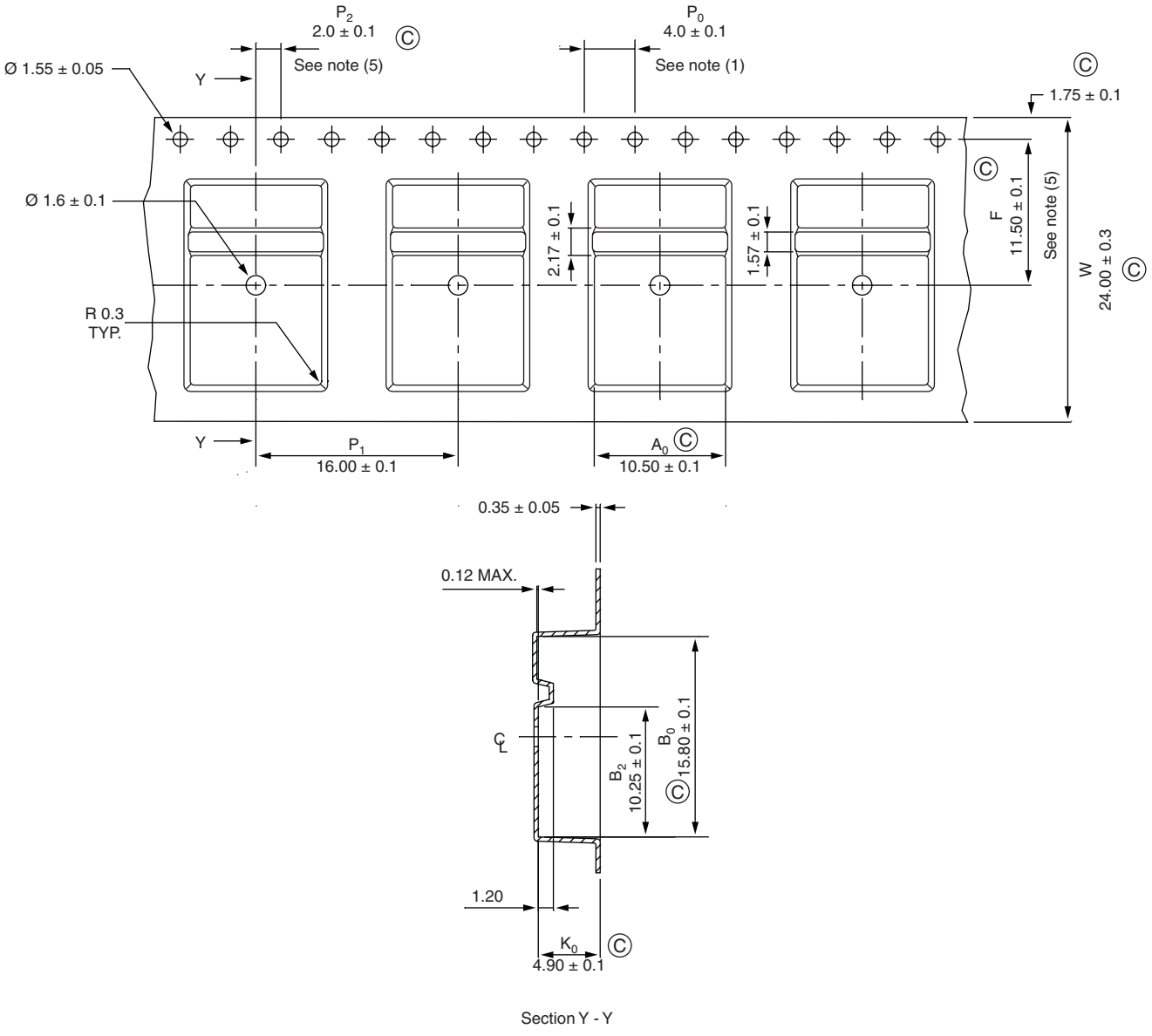
SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	2.03	3.02	0.080	0.119	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2
D1	6.86	-	0.270	-	3
E	9.65	10.67	0.380	0.420	2, 3
E1	6.22	-	0.245		3
e	2.54 BSC		0.100 BSC		
L	13.46	14.10	0.530	0.555	
L1	-	1.65	-	0.065	3
L2	3.56	3.71	0.140	0.146	

Notes

(1) Dimensioning and tolerancing as per ASME Y14.5M-1994
(2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
(3) Thermal pad contour optional within dimension E, L1, D1 and E1
(4) Dimension b1 and c1 apply to base metal only
(5) Controlling dimension: inches
(6) Outline conform to JEDEC TO-262 except A1 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline

D²PAK

TAPE AND REEL INFORMATION in millimeters (inches)



Section Y - Y

Notes

(1) 10 sprocket hole pitch cumulative tolerance ± 0.02
(2) Camber not to exceed 1 mm in 100 mm
(3) Material: conductive black styrenic alloy
(4) K_0 measured from a plane on the inside bottom of the pocket to the top surface of the carrier
(5) Measured from centerline of sprocket hole to centerline of pocket
(6) Vendor: (optional)
(7) Must also meet requirements of EIA standard # EIA-481A taping of surface mount components for automatic placement
(8) Surface resistivity of molded material must measure less or equal to 10^6 Ω per square. Measured in accordance to procedure given in ASTM D-257 and ASTM D-991
(9) Total length per reel must be 45 m
(10) Ⓒ critical