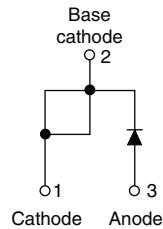


## HEXFRED® Ultrafast Soft Recovery Diode, 8 A


**TO-220AC**
**FEATURES**

- Ultrafast recovery
- Ultrasoft recovery
- Very low  $I_{RRM}$
- Very low  $Q_{rr}$
- Specified at operating conditions
- Lead (Pb)-free
- Designed and qualified for industrial level


**RoHS\***  
COMPLIANT

**BENEFITS**

- Reduced RFI and EMI
- Reduced power loss in diode and switching transistor
- Higher frequency operation
- Reduced snubbing
- Reduced parts count

**DESCRIPTION**

HFA08TB60 is a state of the art ultrafast recovery diode. Employing the latest in epitaxial construction and advanced processing techniques it features a superb combination of characteristics which result in performance which is unsurpassed by any rectifier previously available. With basic ratings of 600 V and 8 A continuous current, the HFA08TB60 is especially well suited for use as the companion diode for IGBTs and MOSFETs. In addition to ultrafast recovery time, the HEXFRED® product line features extremely low values of peak recovery current ( $I_{RRM}$ ) and does not exhibit any tendency to “snap-off” during the  $t_b$  portion of recovery. The HEXFRED features combine to offer designers a rectifier with lower noise and significantly lower switching losses in both the diode and the switching transistor. These HEXFRED advantages can help to significantly reduce snubbing, component count and heatsink sizes. The HEXFRED HFA08TB60 is ideally suited for applications in power supplies and power conversion systems (such as inverters), motor drives, and many other similar applications where high speed, high efficiency is needed.

**PRODUCT SUMMARY**

$V_R$	600 V
$V_F$ at 8 A at 25 °C	1.7 V
$I_{F(AV)}$	8 A
$t_{rr}$ (typical)	18 ns
$T_J$ (maximum)	150 °C
$Q_{rr}$ (typical)	65 nC
$di_{(rec)M}/dt$ (typical)	240 A/ $\mu$ s
$I_{RRM}$	5.0 A

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	$V_R$		600	V
Maximum continuous forward current	$I_F$	$T_C = 100\text{ °C}$	8	A
Single pulse forward current	$I_{FSM}$		60	
Maximum repetitive forward current	$I_{FRM}$		24	
Maximum power dissipation	$P_D$	$T_C = 25\text{ °C}$	36	W
		$T_C = 100\text{ °C}$	14	
Operating junction and storage temperature range	$T_J, T_{Stg}$		- 55 to + 150	°C

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

ELECTRICAL SPECIFICATIONS (T <sub>J</sub> = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V <sub>BR</sub>	I <sub>R</sub> = 100 μA	600	-	-	V
Maximum forward voltage	V <sub>FM</sub>	I <sub>F</sub> = 8.0 A	-	1.4	1.7	
		I <sub>F</sub> = 16 A	-	1.7	2.1	
		I <sub>F</sub> = 8.0 A, T <sub>J</sub> = 125 °C	-	1.4	1.7	
Maximum reverse leakage current	I <sub>RM</sub>	V <sub>R</sub> = V <sub>R</sub> rated	-	0.3	5.0	μA
		T <sub>J</sub> = 125 °C, V <sub>R</sub> = 0.8 x V <sub>R</sub> rated	-	100	500	
Junction capacitance	C <sub>T</sub>	V <sub>R</sub> = 200 V	-	10	25	pF
Series inductance	L <sub>S</sub>	Measured lead to lead 5 mm from package body	-	8.0	-	nH

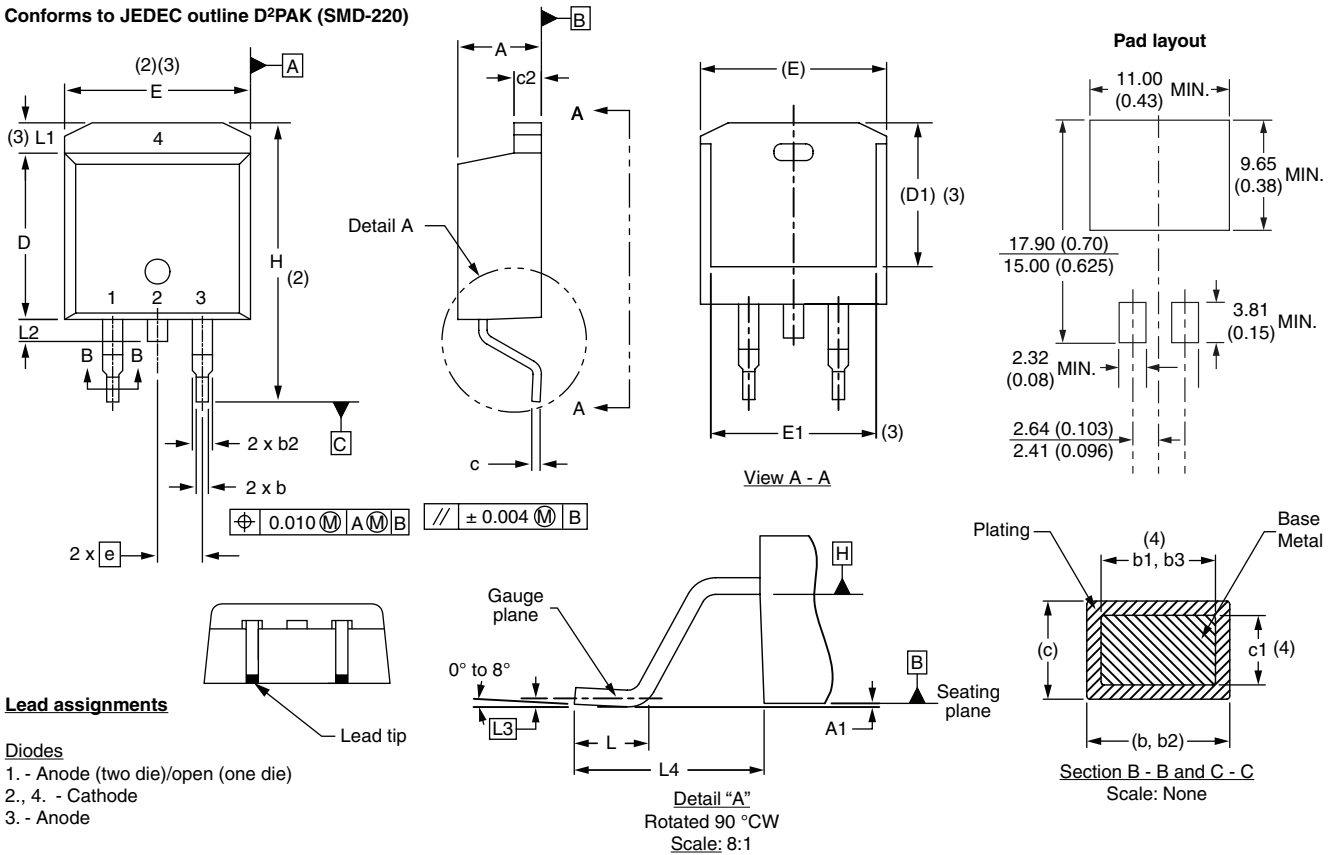
DYNAMIC RECOVERY CHARACTERISTICS (T <sub>J</sub> = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = 1.0 A, dI <sub>F</sub> /dt = 200 A/μs, V <sub>R</sub> = 30 V	-	18	-	ns
	t <sub>rr1</sub>	T <sub>J</sub> = 25 °C	-	37	55	
	t <sub>rr2</sub>	T <sub>J</sub> = 125 °C	-	55	90	
Peak recovery current	I <sub>RRM1</sub>	T <sub>J</sub> = 25 °C	-	3.5	5.0	A
	I <sub>RRM2</sub>	T <sub>J</sub> = 125 °C	-	4.5	8.0	
Reverse recovery charge	Q <sub>rr1</sub>	T <sub>J</sub> = 25 °C	-	65	138	nC
	Q <sub>rr2</sub>	T <sub>J</sub> = 125 °C	-	124	360	
Peak rate of fall of recovery current during t <sub>b</sub>	dI <sub>(rec)</sub> /dt1	T <sub>J</sub> = 25 °C	-	240	-	A/μs
	dI <sub>(rec)</sub> /dt2	T <sub>J</sub> = 125 °C	-	210	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Lead temperature	T <sub>lead</sub>	0.063" from case (1.6 mm) for 10 s	-	-	300	°C
Thermal resistance, junction to case	R <sub>thJC</sub>		-	-	3.5	K/W
Thermal resistance, junction to ambient	R <sub>thJA</sub>	Typical socket mount	-	-	80	
Thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, flat, smooth and greased	-	0.5	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-220AC	HFA08TB60			

## D<sup>2</sup>PAK

### DIMENSIONS in millimeters and inches

Conforms to JEDEC outline D<sup>2</sup>PAK (SMD-220)



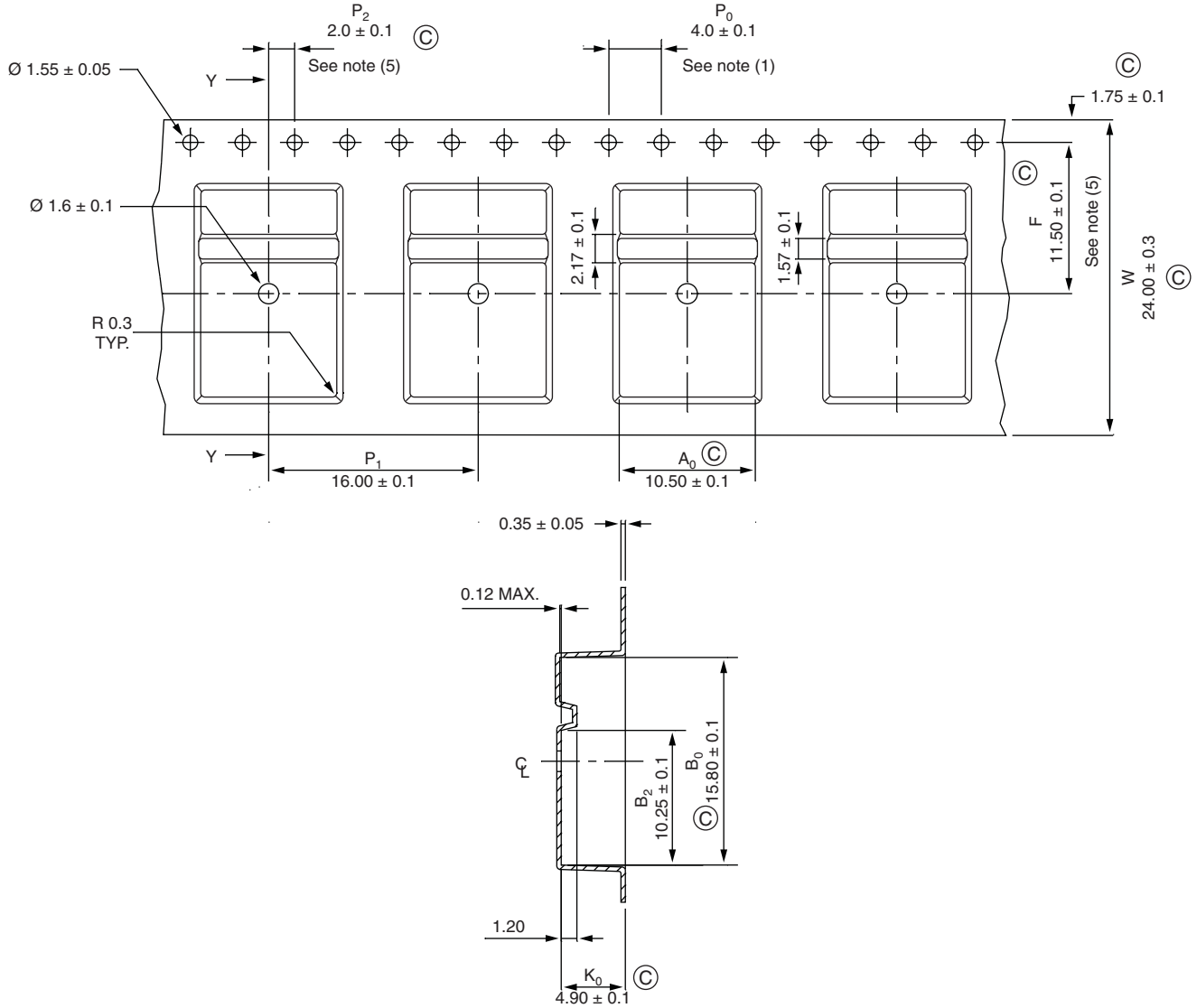
SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.			MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190		D1	6.86	-	0.270	-	3
A1	0.00	0.254	0.000	0.010		E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039		E1	6.22	-	0.245	-	3
b1	0.51	0.89	0.020	0.035	4	e	2.54 BSC		0.100 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

### D<sup>2</sup>PAK

#### TAPE AND REEL INFORMATION in millimeters (inches)



Section Y - Y

#### Notes

- (1) 10 sprocket hole pitch cumulative tolerance  $\pm 0.02$
- (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  $10^6 \Omega$  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)  $\text{C}$  critical