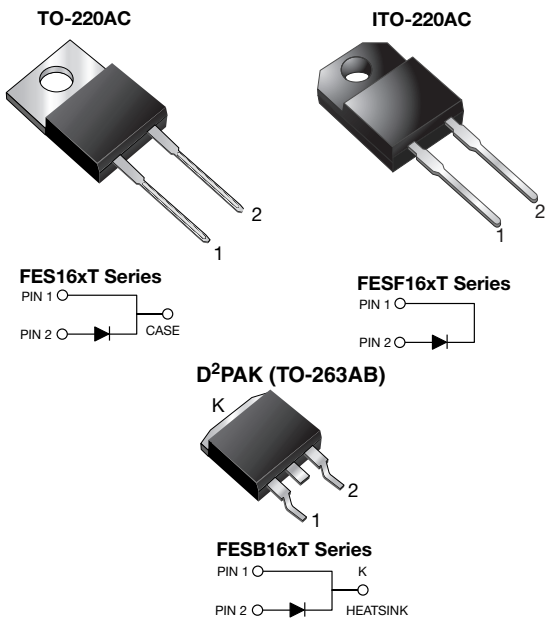
Ultrafast Plastic Rectifier



DESIGN SUPPORT TOOLS AVAILABLE

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	50 V to 600 V
I_{FSM}	250 A
t_{rr}	35 ns, 50 ns
V_F	0.975 V, 1.30 V, 1.50 V
T_J max.	150 °C
Package	TO-220AC, ITO-220AC, D²PAK (TO-263AB)
Circuit configurations	Single

FEATURES

RoHS COMPLIANT
HALOGEN FREE Available

- Power pack
- Glass passivated pellet chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for D²PAK (TO-263AB) package)
- Solder dip 275 °C max. 10 s, per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- AEC-Q101 qualified available
  - Automotive ordering code:
    base P/NHE3(for ITO-220AC)
    base P/NHM3(for D2PAK (TO-263AB package))
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, DC/DC converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,....)

Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

Base P/NHM3 - RoHS-compliant, halogen-free, AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs max.

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FES16AT FESF16AT	FES16BT FESF16BT	FES16CT FESF16CT	FES16DT FESF16DT FESB16DT	FES16FT FESF16FT	FES16GT FESF16GT FESB16GT	FES16HT FESF16HT	FES16JT FESF16JT FESB16JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	500	600	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	500	600	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	16								A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250								A
Operating storage and temperature range	T_J, T_{STG}	-65 to +150								°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500								V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	FES16AT FESF16AT	FES16BT FESF16BT	FES16CT FESF16CT	FES16DT FESF16DT FESB16DT	FES16FT FESF16FT	FES16GT FESF16GT FESB16GT	FES16HT FESF16HT	FES16JT FESF16JT FESB16JT	UNIT
Maximum instantaneous forward voltage	16 A	V_F (1)	0.975				1.30		1.50		V
Maximum DC reverse current at rated DC blocking voltage	T_C = 25 °C	I_R	10								µA
	T_C = 100 °C		500								
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	35				50				ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	175						145		pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FES	FESF	FESB	UNIT
Typical thermal resistance, junction to case	$R_{\theta JC}$	1.2	1.7	1.2	°C/W

ORDERING INFORMATION (Example)

PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	FES16JT-E3/45	1.78	45	50/tube	Tube
ITO-220AC	FESF16JT-E3/45	1.80	45	50/tube	Tube
D^2PAK (TO-263AB)	FESB16JT-M3/I	1.33	I	800/reel	Tape and reel
ITO-220AC	FESF16JTHE3_A/P (1)	1.80	P	50/tube	Tube
D^2PAK (TO-263AB)	FESB16JTHM3/I (1)	1.33	I	800/reel	Tape and reel

Note

(1) AEC-Q101 qualified, available in ITO-220AC and D^2PAK (TO-263AB) package

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

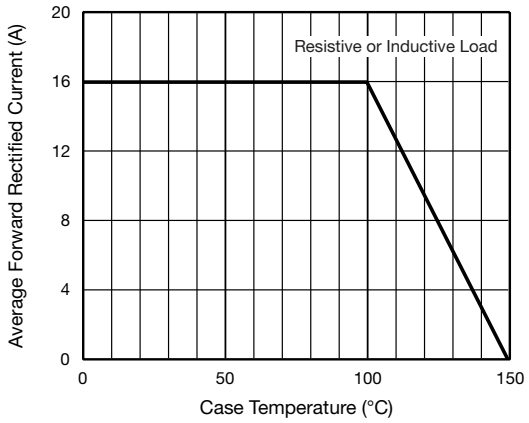


Fig. 1 - Maximum Forward Current Derating Curve

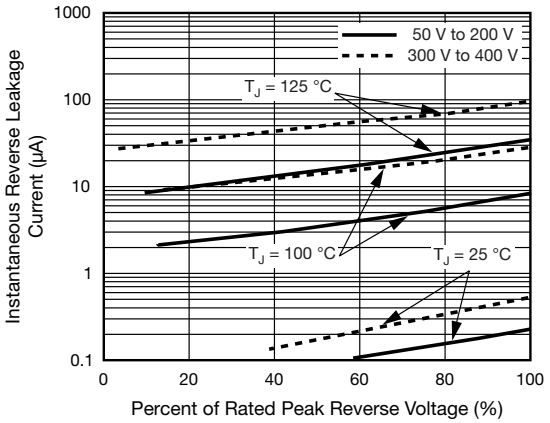


Fig. 4 - Typical Reverse Leakage Characteristics

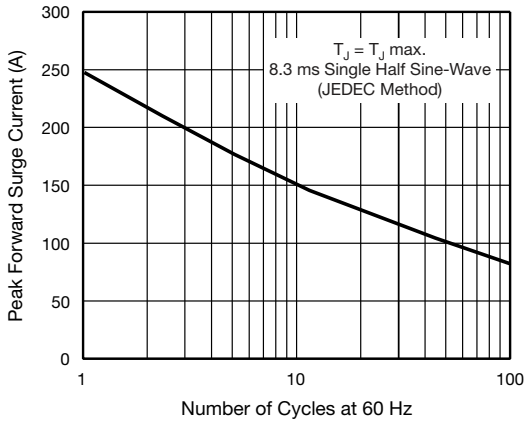


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

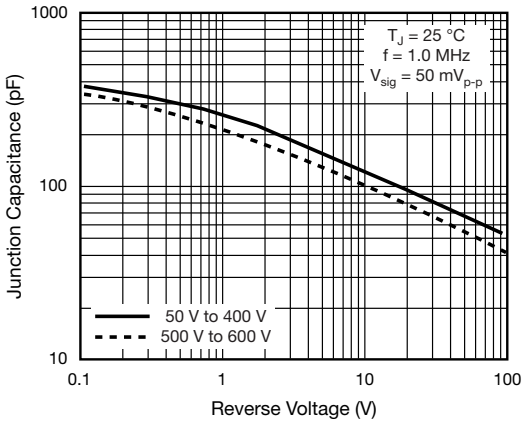


Fig. 5 - Typical Junction Capacitance

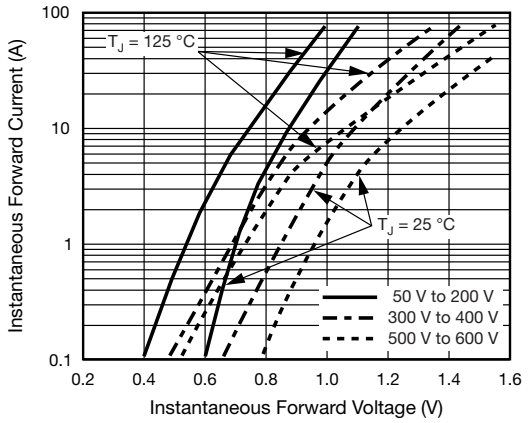
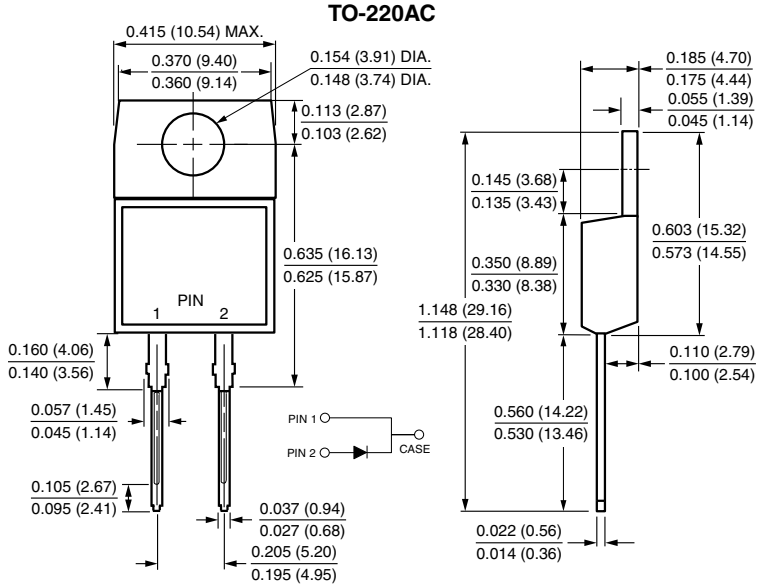


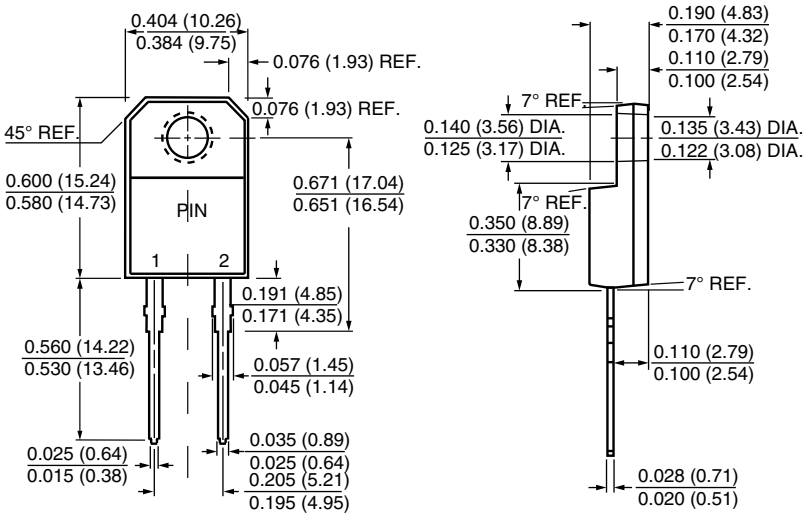
Fig. 3 - Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

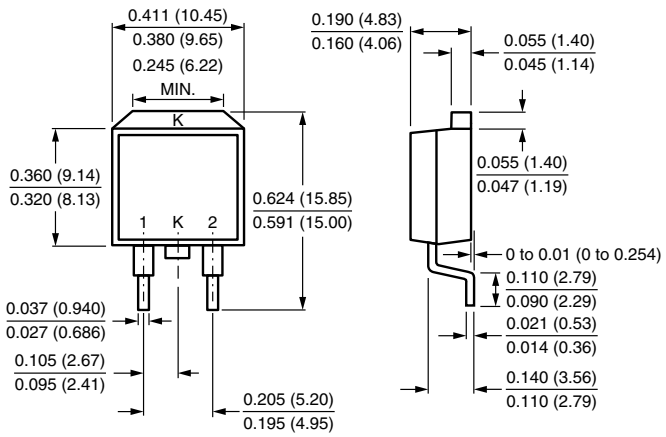
TO-220AC



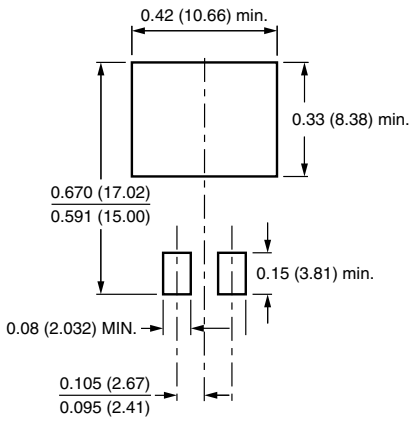
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout



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