

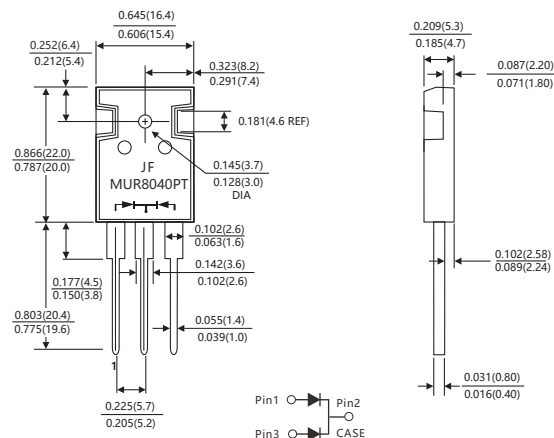
FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Ultrafast and soft recovery time for high efficiency
- Low VF ,Low IRRM,Low power loss
- Polyimide passivation
- High surge capability
- Soft reverse recovery for low EMI/RFI
- High temperature soldering guaranteed:260°C/10 seconds at terminals
- Component in accordance to RoHS 2011/65/EU

TO-247AB

MECHANICAL DATA

- Case: JEDEC TO-247AB molded plastic body
- Terminals: Lead solderable per MIL-STD-750,method 2026
- Polarity: As marked
- Weight: 0.22ounce, 6 grams
- Mounting Position: Any



Dimensions in inches and (millimeters)

TYPICAL APPLICATIONS

- For use in boost stage in SMPS
- high frequency inverters for solar inverters
- DC/DC converters
- high frequency output rectification of battery chargers
- free wheeling diodes in motor drivers

PRIMARY CHARACTERISTICS

| | |
|--------------|----------------|
| $I_F(AV)$ | $2 \times 40A$ |
| V_R | 400V |
| T_{rr} typ | 45ns |

MAXIMUM RATINGS

(Ratings at 25°C ambient temperature unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------|
| Maximum repetitive peak reverse voltage | V_{RRM} | 400 | V |
| Maximum average forward rectified current | $I_F(AV)$ | 80 | A |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated T_J) | I_{FSM} | 400 | A |
| Operating junction temperature range | T_J | -55 to +175 | °C |
| Storage temperature range | T_{stg} | -55 to +175 | °C |

RATINGS AND CHARACTERISTIC OF MUR8040PT

ELECTRICAL CHARACTERISTICS (T_J=25°C Unless otherwise noted)

| Parameter | Test Conditions | | Symbol | Min. | Typ. | Max. | Unit |
|---------------------------------------|-----------------------|-----------------------|-----------------------------------|------|------|------|------|
| Breakdown voltage Blocking voltage | I _R =100μA | | V _{BR} V _R | 400 | – | – | V |
| Instaneous forward voltage Per Leg | T _J =25°C | I _F =5.0A | V _F ¹⁾ | – | 0.85 | – | V |
| | | I _F =10.0A | | – | 0.95 | – | |
| | | I _F =40.0A | | – | 1.23 | 1.43 | |
| | T _J =125°C | I _F =5.0A | | – | 0.66 | – | |
| | | I _F =10.0A | | – | 0.77 | – | |
| | | I _F =40.0A | | – | 1.08 | – | |
| Reverse Current Per Leg | T _J =25°C | V _R =400V | I _R ²⁾ | – | 0.1 | 1.0 | μA |
| | T _J =125°C | | | – | 10.0 | – | μA |
| | T _J =150°C | | | – | 400 | – | μA |
| Junction capacitance | 4V, 1MHz, Per Leg | | C _J | – | 277 | – | pF |

Notes: 1. Pulse test: 300 μs pulse width, 1% duty cycle

2. Pulse test: pulse width ≤ 40ms

DYNAMIC RECOVERY CHARACTERISTICS (T_J=25°C Unless otherwise noted)

| Parameter | Test Conditions | | Symbol | Min. | Typ. | Max. | Unit |
|-------------------------|---|--|------------------|------|------|------|------|
| Reverse recovery time | I _F =0.5A, I _R =1.0A, I _R =0.25A | | t _{rr} | – | 37 | 45 | ns |
| | T _J =25°C | I _F =40A dI _F /dt=200A/μS V _R =270V | | – | 50 | – | |
| | T _J =125°C | | | – | 79 | – | |
| Peak recovery current | T _J =25°C | I _F =40A dI _F /dt=200A/μS V _R =270V | I _{RRM} | – | 4.3 | – | A |
| | T _J =125°C | | | – | 8.5 | – | |
| Reverse recovery charge | T _J =25°C | I _F =40A dI _F /dt=200A/μS V _R =270V | Q _{rr} | – | 110 | – | nC |
| | T _J =125°C | | | – | 350 | – | |

RATINGS AND CHARACTERISTIC OF MUR8040PT

THERMAL CHARACTERISTICS

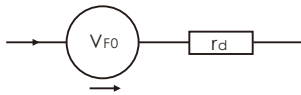
| Parameter | Symbol | TO-247AB | Unit |
|--|-----------------|-----------------------|------|
| Typical thermal resistance ³⁾ | $R_{\theta JC}$ | 0.44 Typ. 0.90 MAX | °C/W |

3.Thermal resistance from junction to case

AVAILABLE PACK INFORMATION

| Product code | Pack | Box Size L×W×H(mm) | Quantity (pcs/box) | Carton SizeL×W×H(mm) | Quantity (box/carton) |
|--------------------|------|--------------------|--------------------|----------------------|-----------------------|
| MUR8040PT-TO-247AB | P/T | 530×110×60 | 360 | 550×330×130 | 5 |

Equivalent circuits for power loss calculation



V_{F0} : threshold voltage 0.79V

r_d : Dynamic resistance 0.007 Ω

Forward power loss of diode= $V_{F0} \times I_F(AV) + r_d \times I_F^2(RMS)$

FIG.1-FORWARD CURRENT DERATING CURVE

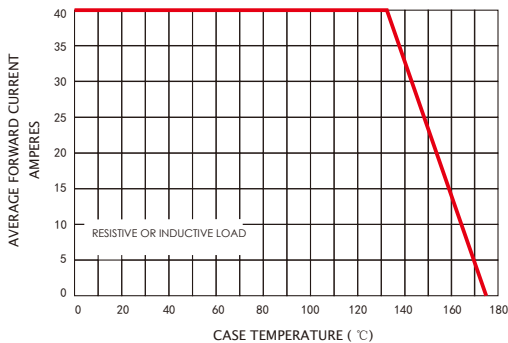
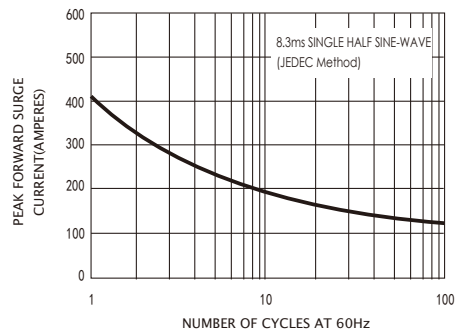


FIG.2-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



RATINGS AND CHARACTERISTIC OF MUR8040PT

FIG.3-TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

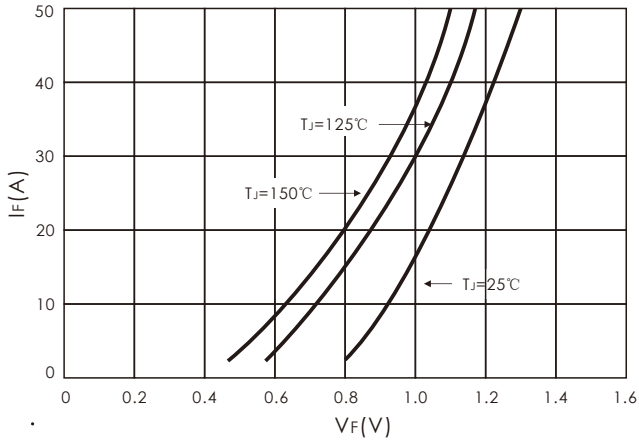


FIG.4-TYPICAL REVERSE CHARACTERISTICS

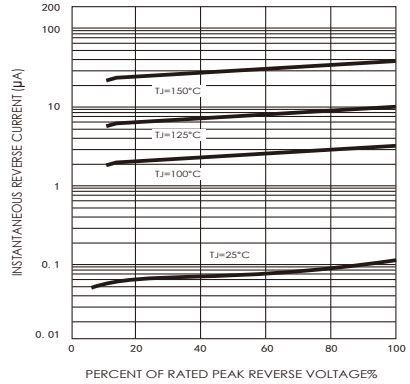


FIG.5-TYPICAL JUNCTION CAPACITANCE

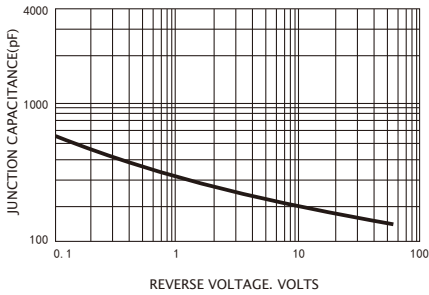


FIG.6- TYPICAL REVERSE RECOVERY TIME vs. dI_F/dt

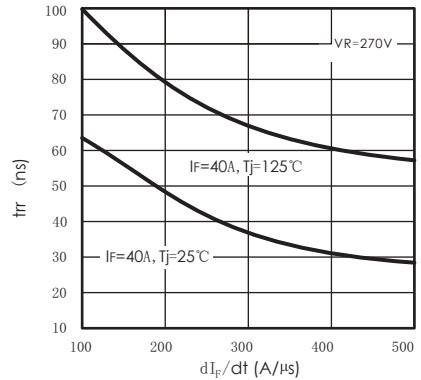


FIG.7- TYPICAL STORED CHARGE VS. dI_F/dt

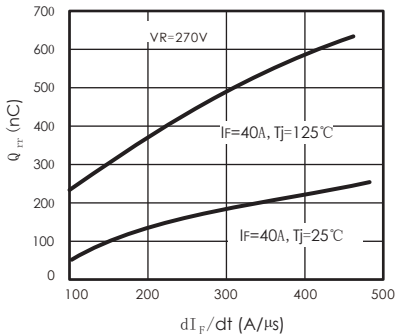
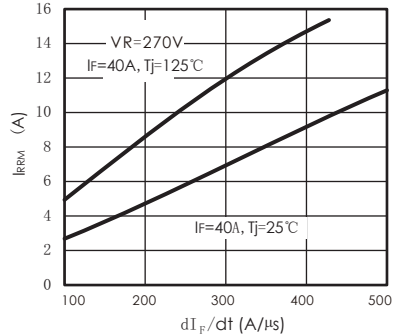
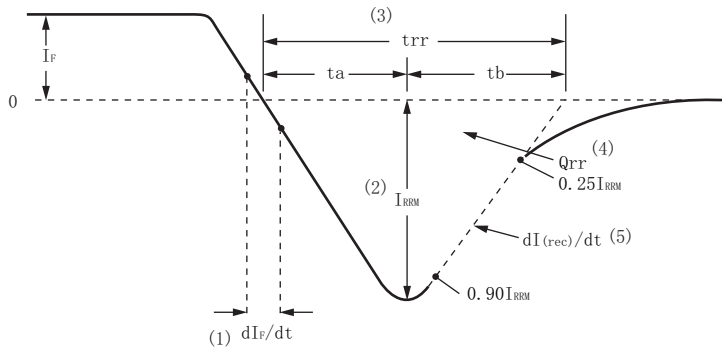
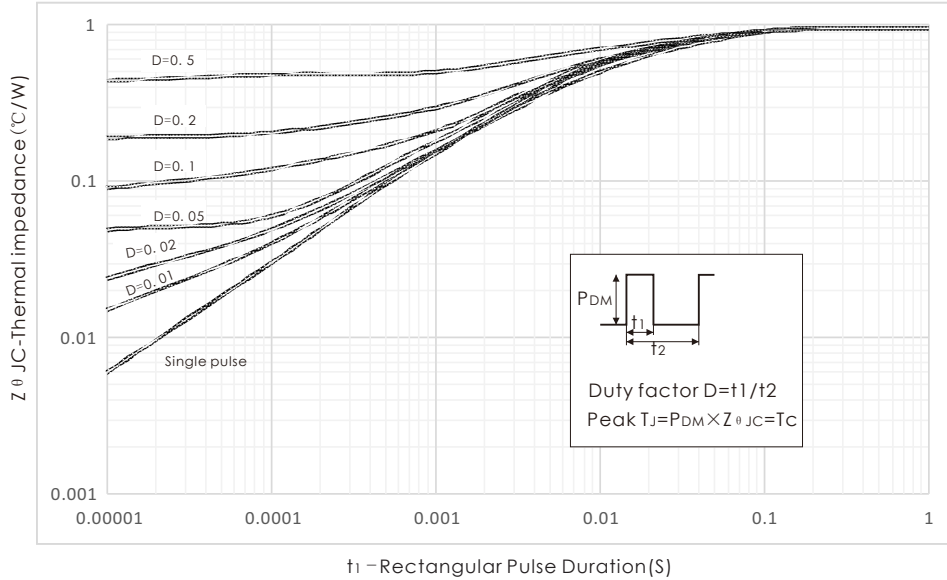


FIG.8- TYPICAL REVERSE RECOVERY CURRENT VS. dI_F/dt



RATINGS AND CHARACTERISTIC OF MUR8040PT

FIG.9- Maximum Thermal Impedance $Z_{\theta JC}$ characteristics



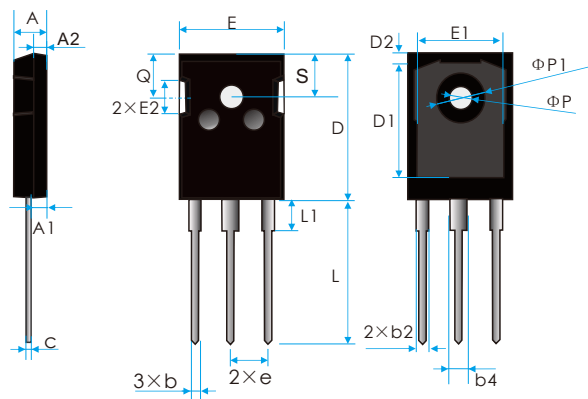
- (1) dI_F/dt -rate of change of current through zero crossing
- (2) I_{RRM} -peak reverse recovery current
- (3) t_{rr} - reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through $0.90I_{RRM}$ and $0.25I_{RRM}$ extrapolated to zero current
- (4) Q_{rr} -area under curve defined by t_{rr} and I_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

- (5) $dI_{(rec)}/dt$ -peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

PACKAGE OUTLINE DIMENSIONS



| Symbol | millimeter | | |
|--------|------------|------|-------|
| | Min. | Typ. | MAX |
| A | 4.70 | | 5.30 |
| A1 | 2.21 | | 2.59 |
| A2 | 1.50 | | 2.49 |
| D | 20.30 | | 20.70 |
| E | 15.48 | | 16.24 |
| E2 | 4.30 | | 5.50 |
| e | | 5.46 | |
| L | 19.80 | | 20.30 |
| L1 | 4.40 | | 4.60 |
| ΦP | | 3.50 | |
| Q | 5.38 | | 6.19 |
| S | | 6.14 | |
| b | 0.99 | | 1.40 |
| b2 | 1.65 | | 2.39 |
| b4 | 2.59 | | 3.43 |
| c | 0.38 | | 0.89 |
| D1 | 13.07 | | |
| D2 | 0.51 | | 1.35 |
| E1 | 13.45 | | |
| ΦP1 | | 7.20 | |