

VS-T70HF40 Datasheet



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| | |
|------------------------------|--|
| DiGi Electronics Part Number | VS-T70HF40-DG |
| Manufacturer | Vishay General Semiconductor - Diodes Division |
| Manufacturer Product Number | VS-T70HF40 |
| Description | DIODE GEN PURP 400V 70A D-55 |
| Detailed Description | Diode 400 V 70A Chassis Mount D-55 |

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Purchase and inquiry

Manufacturer Product Number:

VS-T70HF40

Series:

-

Technology:

Standard

Current - Average Rectified (Io):

70A

Current - Reverse Leakage @ Vr:

15 mA @ 400 V

Mounting Type:

Chassis Mount

Supplier Device Package:

D-55

Manufacturer:

Vishay General Semiconductor - Diodes Division

Product Status:

Active

Voltage - DC Reverse (Vr) (Max):

400 V

Speed:

Standard Recovery >500ns, > 200mA (Io)

Capacitance @ Vr, F:

-

Package / Case:

D-55 T-Module

Base Product Number:

T70

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0080

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



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Power Rectifiers Diodes (T-modules), 40 A to 110 A



D-55 (T-module)

FEATURES

- Electrically isolated base plate
- Types up to 1200 V_{RRM}
- 3500 V_{RMS} isolating voltage
- Simplified mechanical designs, rapid assembly
- High surge capability
- Large creepage distances
- UL E78996 approved 
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

| PRIMARY CHARACTERISTICS | |
|-------------------------|-------------------------------|
| I _{F(AV)} | 40 A to 110 A |
| Type | Modules - diode, high voltage |
| V _{RRM} | 100 V to 1200 V |
| Package | D-55 (T-module) |
| Circuit configuration | Single diode |

DESCRIPTION / APPLICATIONS

These series of T-modules use standard recovery power rectifier diodes. The semiconductors are electrically isolated from the metal base, allowing common heatsink and compact assembly to be built.

Applications include power supplies, battery charges, welders, motor controls and general industrial current rectification.

| MAJOR RATINGS AND CHARACTERISTICS | | | | | | |
|-----------------------------------|-----------------|-------------|--------|---------|---------|-------------------|
| SYMBOL | CHARACTERISTICS | T40HF | T70HF | T85HF | T110HF | UNITS |
| I _{F(AV)} | | 40 | 70 | 85 | 110 | A |
| | T _C | 85 | 85 | 85 | 85 | °C |
| I _{F(RMS)} | | 63 | 110 | 134 | 173 | A |
| I _{FSM} | 50 Hz | 570 | 1200 | 1700 | 2000 | A |
| | 60 Hz | 600 | 1250 | 1800 | 2100 | |
| I ² _t | 50 Hz | 1630 | 7100 | 14 500 | 20 500 | A ² s |
| | 60 Hz | 1500 | 6450 | 13 500 | 18 600 | |
| I ² √t | | 16 300 | 70 700 | 148 700 | 204 300 | A ² √s |
| V _{RRM} | | 100 to 1200 | | | | V |
| T _J | | -40 to +150 | | | | °C |

ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS | | | | |
|---|--------------|---|---|--|
| TYPE NUMBER | VOLTAGE CODE | V _{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V _{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I _{RRM} MAXIMUM AT T _J = 25 °C μA |
| VS-T40HF... VS-T70HF... VS-T85HF... VS-T110HF... | 10 | 100 | 150 | 100 |
| | 20 | 200 | 300 | |
| | 40 | 400 | 500 | |
| | 60 | 600 | 700 | |
| | 80 | 800 | 900 | |
| | 100 | 1000 | 1100 | |
| | 120 | 1200 | 1300 | |



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| FORWARD CONDUCTION | | | | | | | | | |
|---|---------------|--|-----------------------|---|--------|---------|---------|-------------------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | | | | UNITS | |
| | | | | T40HF | T70HF | T85HF | T110HF | | |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 40 | 70 | 85 | 110 | A | |
| | | | | 85 | 85 | 85 | 85 | °C | |
| Maximum RMS forward current | $I_{F(RMS)}$ | | | 63 | 110 | 134 | 173 | A | |
| Maximum peak, one-cycle forward, non-repetitive surge current | I_{FSM} | t = 10 ms t = 8.3 ms | No voltage reappplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 570 | 1200 | 1700 | 2000 | A |
| | | | | | 600 | 1250 | 1800 | 2100 | |
| | | | | | 480 | 1000 | 1450 | 1700 | |
| | | | | | 500 | 1050 | 1500 | 1780 | |
| Maximum I^2t for fusing | I^2t | t = 10 ms t = 8.3 ms | No voltage reappplied | | 1630 | 7100 | 14 500 | 20 500 | A ² s |
| | | | | | 1500 | 6450 | 13 500 | 18 600 | |
| | | | | | 1150 | 5000 | 10 500 | 14 500 | |
| | | | | | 1050 | 4570 | 9600 | 13 200 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reappplied | | 16 300 | 70 700 | 148 700 | 204 300 | A ² √s | |
| Low level value of threshold voltage | $V_{F(TO)1}$ | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$, T_J maximum) | | 0.66 | 0.76 | 0.68 | 0.68 | V | |
| High level value of threshold voltage | $V_{F(TO)2}$ | (I > $\pi \times I_{F(AV)}$, T_J maximum) | | 0.84 | 0.95 | 0.90 | 0.86 | | |
| Low level value of forward slope resistance | r_{f1} | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$, T_J maximum) | | 4.3 | 2.4 | 1.76 | 1.56 | mΩ | |
| High level value of forward slope resistance | r_{f2} | (I > $\pi \times I_{F(AV)}$, T_J maximum) | | 3.1 | 1.7 | 1.08 | 1.12 | | |
| Maximum forward voltage drop | V_{FM} | $I_{FM} = \pi \times I_{F(AV)}$, $T_J = 25^\circ\text{C}$, $t_p = 400 \mu\text{s}$ square pulse Average power = $V_{F(TO)} \times I_{F(AV)} + r_f \times (I_{F(RMS)})^2$ | | 1.30 | 1.35 | 1.27 | 1.35 | V | |

| BLOCKING | | | | | | | |
|--------------------------------------|------------|---|-------|-------|-------|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | T40HF | T70HF | T85HF | T110HF | UNITS |
| Maximum peak reverse leakage current | I_{RRM} | $T_J = 150^\circ\text{C}$ | 15 | 15 | 20 | 20 | mA |
| RMS isolation voltage | V_{ISOL} | 50 Hz, circuit to base, all terminals shorted $T_J = 25^\circ\text{C}$, t = 1 s | 3500 | 3500 | 3500 | 3500 | V |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | | | | |
|---|----------------|---|-------------------------------------|-----------------|-------|-------|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | | | | UNITS |
| | | | | T40HF | T70HF | T85HF | T110HF | |
| Maximum junction operating and storage temperature range | T_J, T_{Stg} | | | -40 to +150 | | | | °C |
| Maximum thermal resistance, junction to case per junction | R_{thJC} | DC operation | | 1.36 | 0.69 | 0.62 | 0.47 | K/W |
| Maximum thermal resistance, case to heatsink | R_{thCS} | Mounting surface smooth, flat and greased | | 0.2 | | | | |
| Mounting torque, $\pm 10\%$ to heatsink terminals | | Non-lubricated threads | M3.5 mounting screws ⁽¹⁾ | 1.3 \pm 10 % | | | | Nm |
| | | | M5 screw terminals | 3 \pm 10 % | | | | |
| Approximate weight | | See dimensions - link at the end of datasheet | | 54 | | | | g |
| Case style | | | | D-55 (T-module) | | | | |

Note

⁽¹⁾ A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound



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| ΔR CONDUCTION PER JUNCTION | | | | | | | | | | | |
|-----------------------------------|---|------|------|------|------|--|------|------|------|------|-------|
| DEVICES | SINUSOIDAL CONDUCTION AT T _J MAXIMUM | | | | | RECTANGULAR CONDUCTION AT T _J MAXIMUM | | | | | UNITS |
| | 180° | 120° | 90° | 60° | 30° | 180° | 120° | 90° | 60° | 30° | |
| T40HF... | 0.12 | 0.14 | 0.18 | 0.27 | 0.46 | 0.09 | 0.15 | 0.20 | 0.28 | 0.46 | K/W |
| T70HF... | 0.09 | 0.11 | 0.14 | 0.20 | 0.35 | 0.07 | 0.11 | 0.15 | 0.21 | 0.35 | |
| T85HF... | 0.08 | 0.09 | 0.12 | 0.18 | 0.31 | 0.06 | 0.10 | 0.13 | 0.19 | 0.31 | |
| T110HF... | 0.05 | 0.07 | 0.09 | 0.14 | 0.23 | 0.05 | 0.08 | 0.10 | 0.15 | 0.24 | |

Note

- Table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

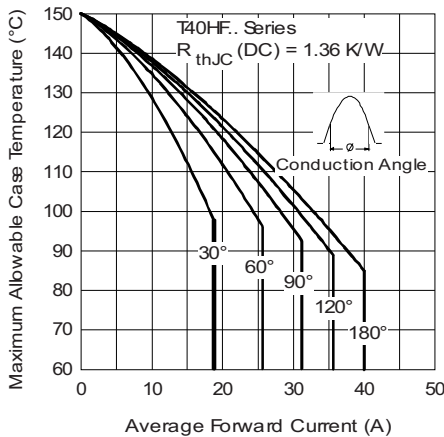


Fig. 1 - Current Ratings Characteristics

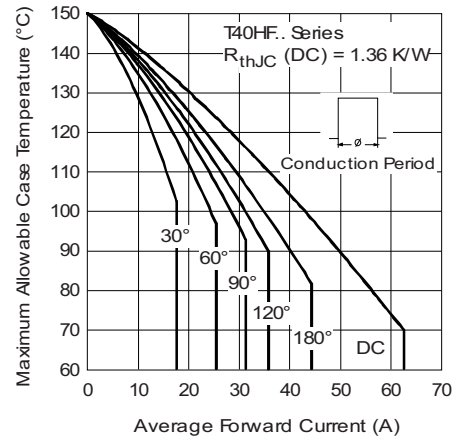


Fig. 2 - Current Ratings Characteristics

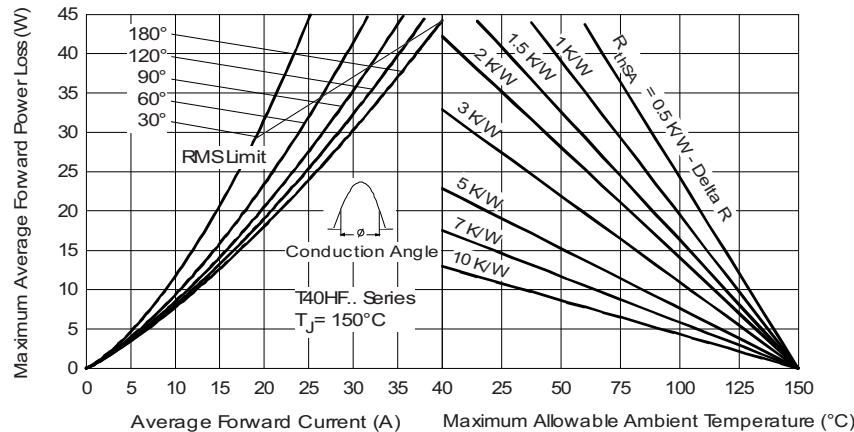


Fig. 3 - Forward Power Loss Characteristics



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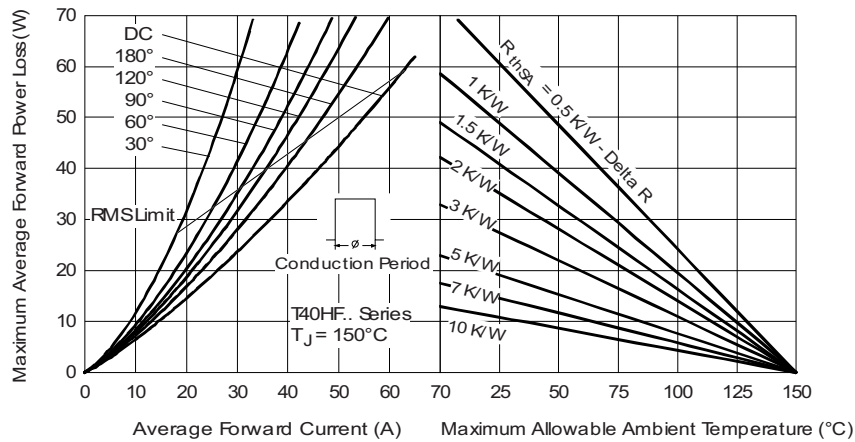


Fig. 4 - Forward Power Loss Characteristics

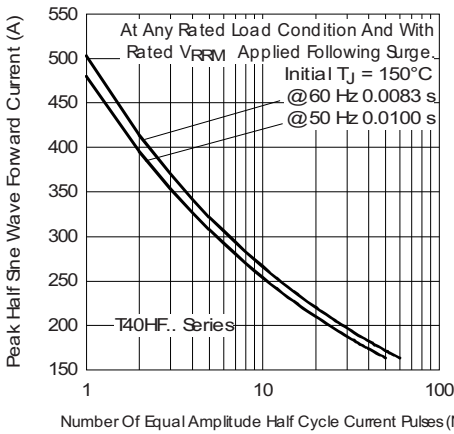


Fig. 5 - Maximum Non-Repetitive Surge Current

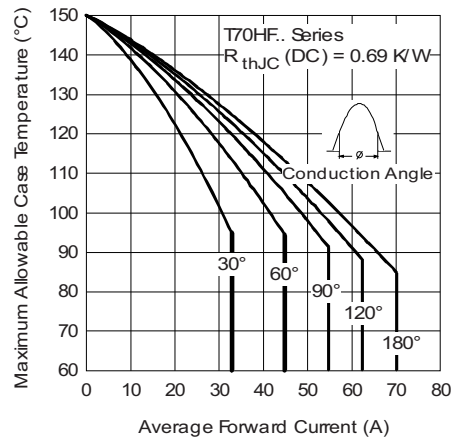


Fig. 7 - Current Ratings Characteristics

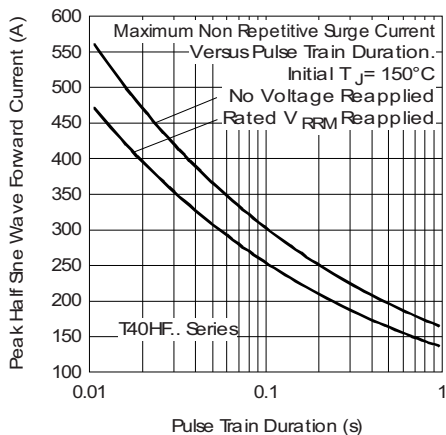


Fig. 6 - Maximum Non-Repetitive Surge Current

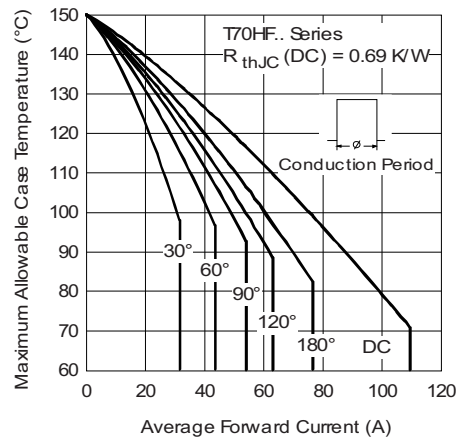


Fig. 8 - Current Ratings Characteristics



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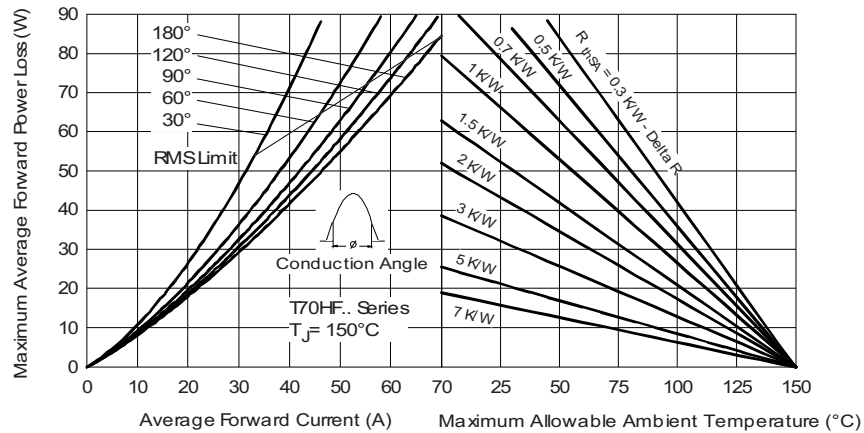


Fig. 9 - Forward Power Loss Characteristics

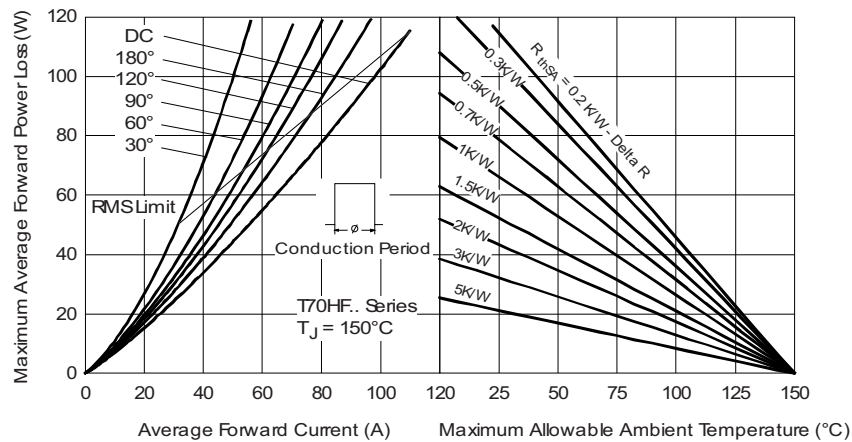


Fig. 10 - Forward Power Loss Characteristics

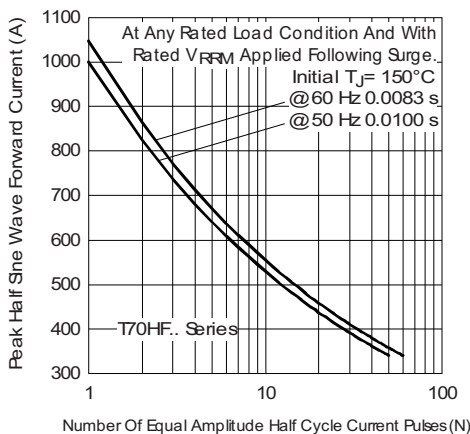


Fig. 11 - Maximum Non-Repetitive Surge Current

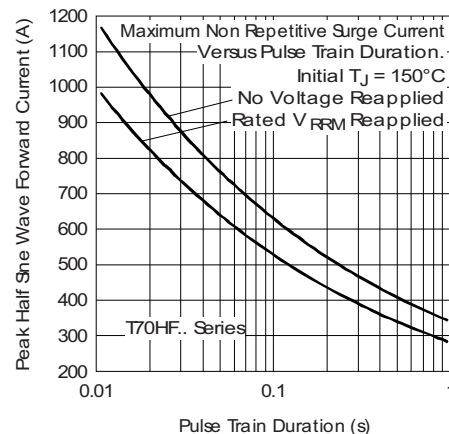


Fig. 12 - Maximum Non-Repetitive Surge Current



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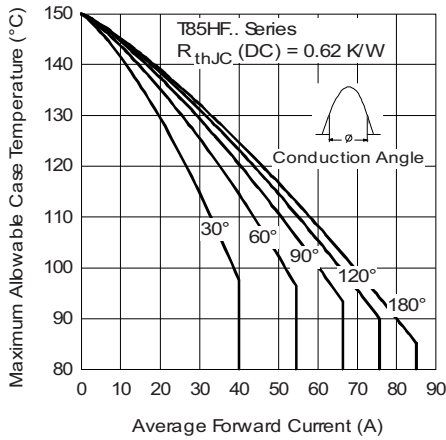


Fig. 13 - Current Ratings Characteristics

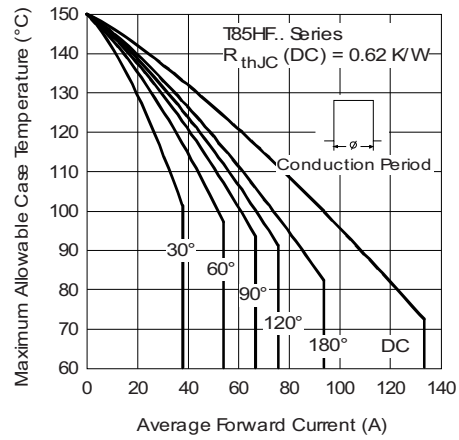


Fig. 14 - Current Ratings Characteristics

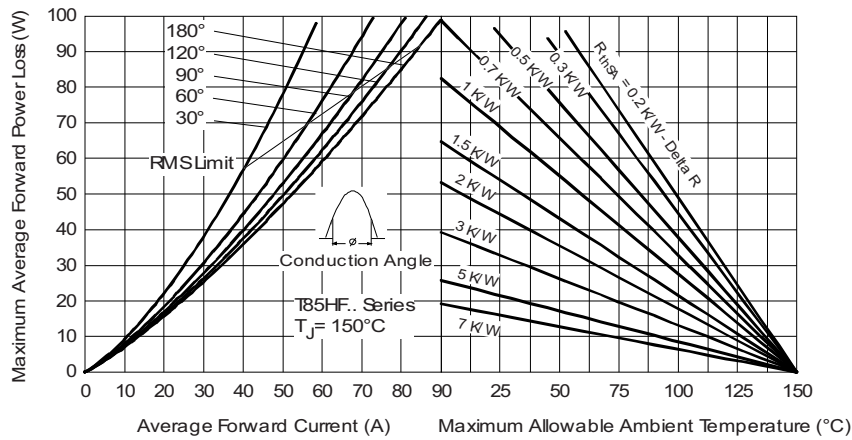


Fig. 15 - Forward Power Loss Characteristics

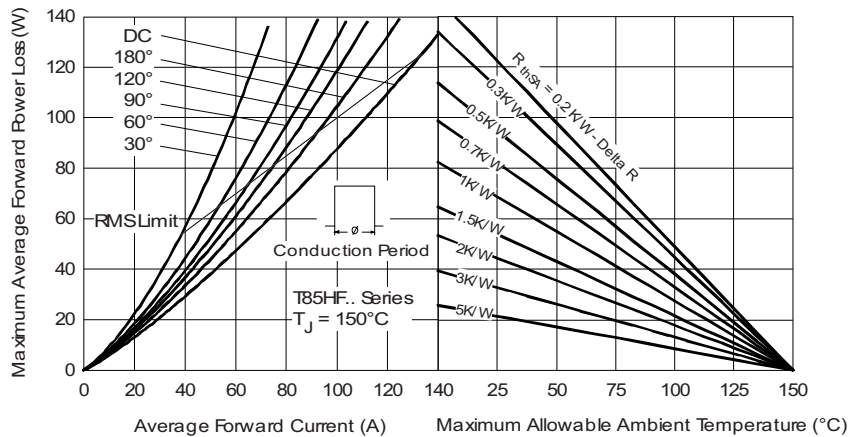


Fig. 16 - Forward Power Loss Characteristics



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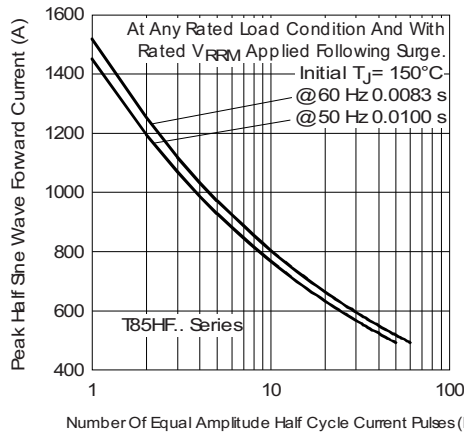


Fig. 17 - Maximum Non-Repetitive Surge Current

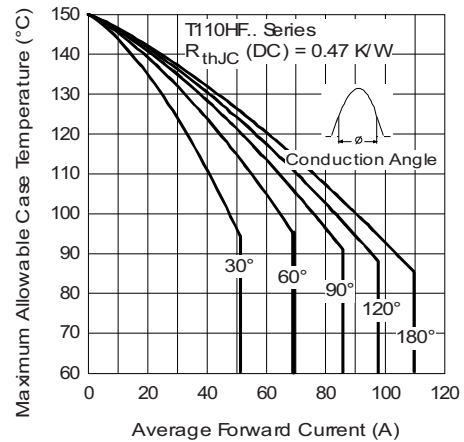


Fig. 19 - Current Ratings Characteristics

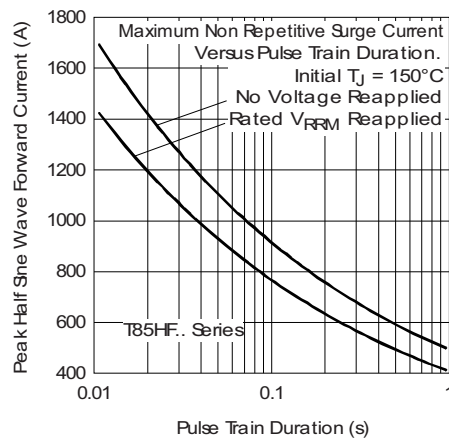


Fig. 18 - Maximum Non-Repetitive Surge Current

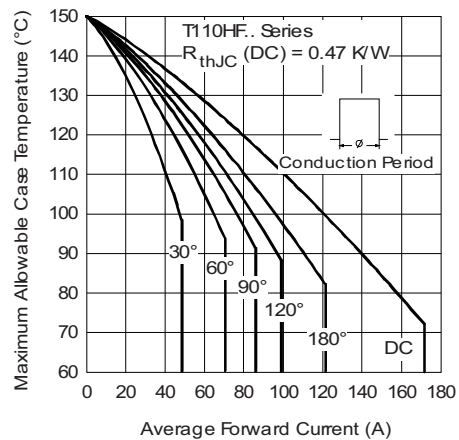


Fig. 20 - Current Ratings Characteristics

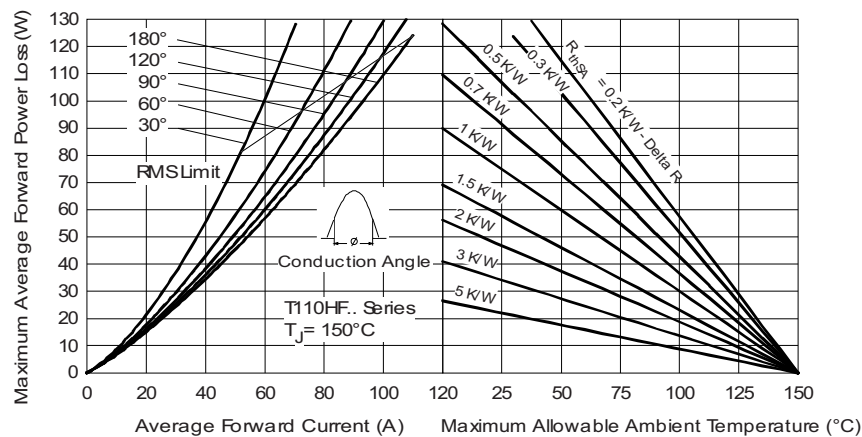


Fig. 21 - Forward Power Loss Characteristics



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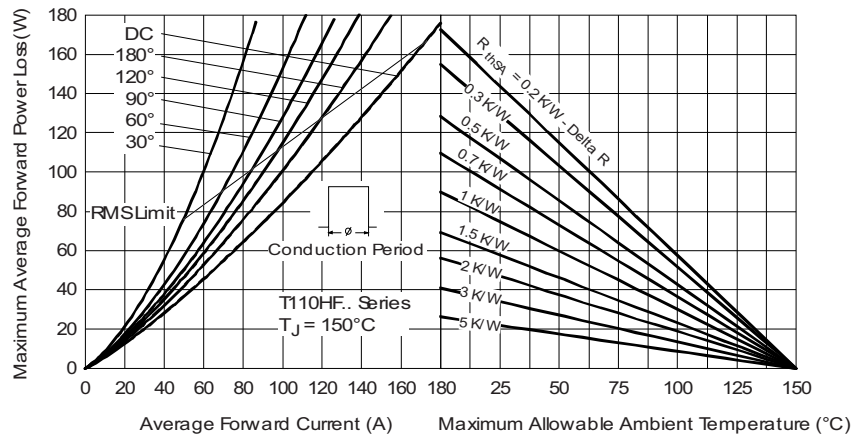


Fig. 22 - Forward Power Loss Characteristics

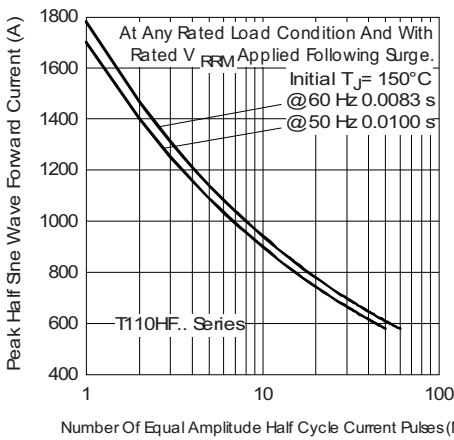


Fig. 23 - Maximum Non-Repetitive Surge Current

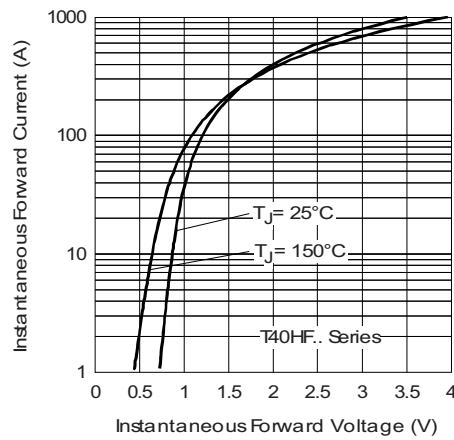


Fig. 25 - Forward Voltage Drop Characteristics

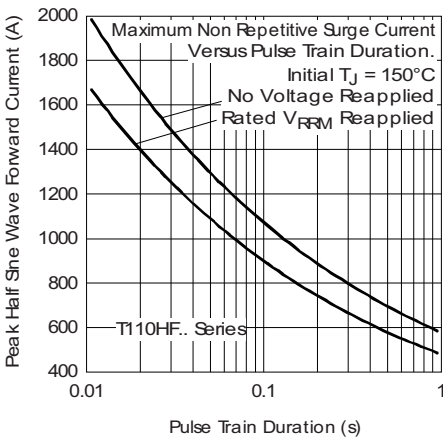


Fig. 24 - Maximum Non-Repetitive Surge Current

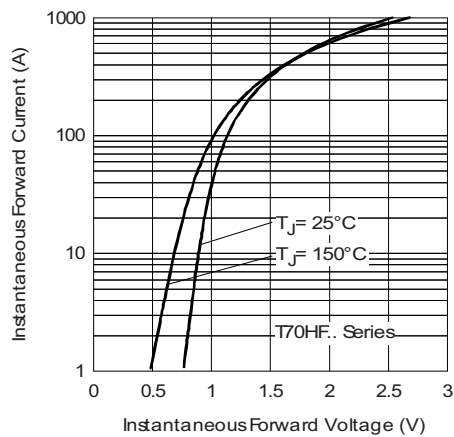


Fig. 26 - Forward Voltage Drop Characteristics



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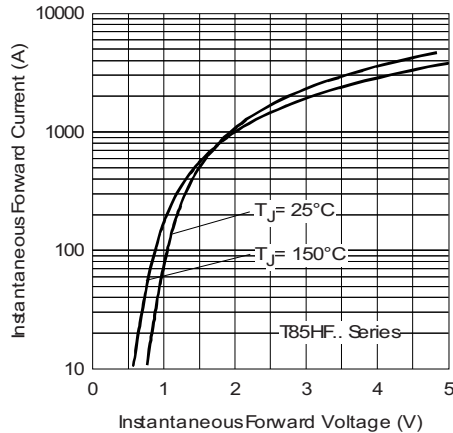


Fig. 27 - Forward Voltage Drop Characteristics

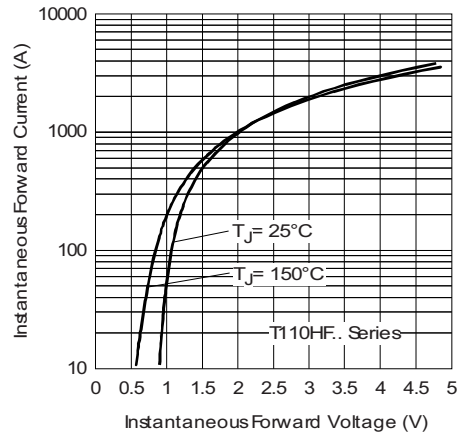


Fig. 28 - Forward Voltage Drop Characteristics

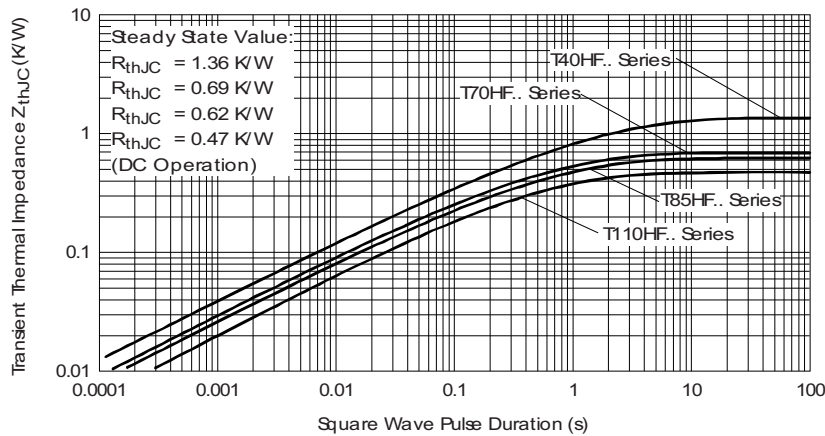


Fig. 29 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

| | | | | | |
|-------------|-------------------------------|-------------|----------------|---|-------------------------------|
| Device code | VS- | T | 110 | HF | 120 |
| | ① | ② | ③ | ④ | ⑤ |
| | 1 | 2 | 3 | 4 | 5 |
| | - | - | - | - | - |
| | Vishay Semiconductors product | Module type | Current rating | Circuit configuration (see Circuit Configuration table) | Voltage code x 10 = V_{RRM} |

| CIRCUIT CONFIGURATION | | |
|-----------------------|----------------------------|-----------------|
| CIRCUIT DESCRIPTION | CIRCUIT CONFIGURATION CODE | CIRCUIT DRAWING |
| Single diode | HF | |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95313 |

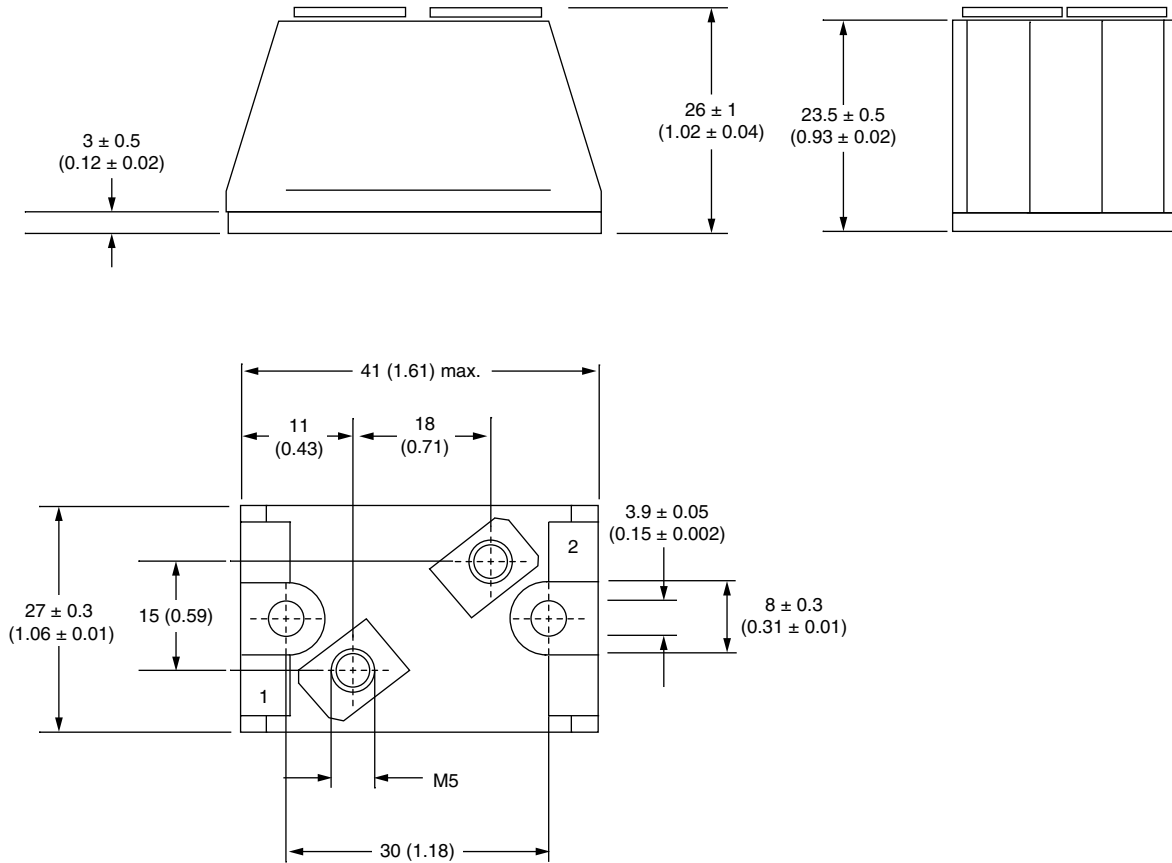

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Outline Dimensions

Vishay Semiconductors

D-55 T-Module Diode Standard and Fast Recovery

DIMENSIONS in millimeters (inches)



Note

- 1 = Anode
- 2 = Cathode



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