

# FRED Module

$V_{RRM} = 600\text{ V}$   
 $I_{FAV} = 95\text{ A}$   
 $t_{rr} = 110\text{ ns}$

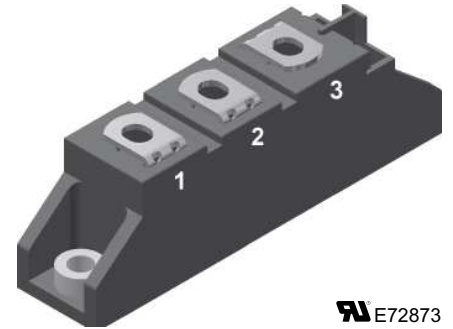
## Fast Recovery Epitaxial Diode


### Part number

MEA 95-06DA

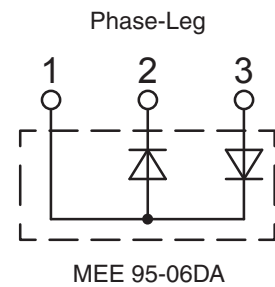
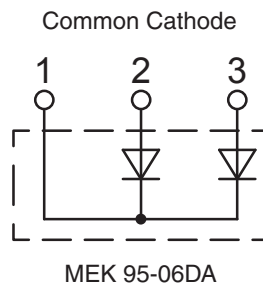
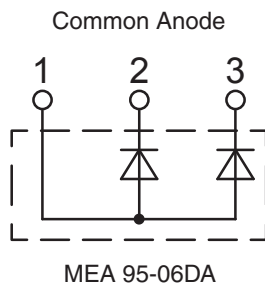
MEK 95-06DA

MEE 95-06DA



 E72873

Backside: isolated



### Features / Advantages:

- Planar passivated chips
- Low switching losses
- Soft recovery behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses

### Applications:

- Antiparallel diode for high frequency switching devices
- Free wheeling diode in converters and motor control circuits
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

### Package: TO-240AA

- Isolation voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

### Disclaimer Notice

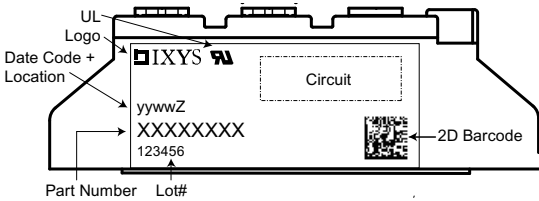
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| Diode       |  |  |                         | Ratings |      |     |                  |
|-------------|--|--|-------------------------|---------|------|-----|------------------|
| Symbol      | Definitions                                  | Conditions   | min.                    | typ.    | max. |     |                  |
| $V_{RSM}$   | max. non-repetitive reverse blocking voltage |  | $T_{VJ} = 25^{\circ}C$  |         | 600  |     | V                |
| $V_{RRM}$   | max. repetitive reverse blocking voltage     |  | $T_{VJ} = 25^{\circ}C$  |         | 600  |     | V                |
| $I_R$       | reverse current                              | $V_R = V_{RRM}$<br>$V_R = 0.8 \cdot V_{RRM}$<br>$V_R = 0.8 \cdot V_{RRM}$                                  | $T_{VJ} = 25^{\circ}C$  |         | 2    |     | mA               |
|             |  |  | $T_{VJ} = 25^{\circ}C$  |         | 0.5  |     | mA               |
|             |  |  | $T_{VJ} = 125^{\circ}C$ |         | 34   |     | mA               |
| $V_F$       | forward voltage                              | $I_F = 100 A$<br><br>$I_F = 300 A$   | $T_{VJ} = 25^{\circ}C$  |         | 1.55 |     | V                |
|             |  |  | $T_{VJ} = 125^{\circ}C$ |         | 1.36 |     | V                |
|             |  |  | $T_{VJ} = 25^{\circ}C$  |         | 2.09 |     | V                |
|             |  |  | $T_{VJ} = 125^{\circ}C$ |         | 2.05 |     | V                |
| $I_{FRMS}$  | RMS forward current                          |  | $T_C = 75^{\circ}C$     |         | 142  |     | A                |
| $I_{FAV}$ ① | average forward current                      | $T_C = 75^{\circ}C$<br>rectangular, d = 0.5  | $T_{VJ} = 150^{\circ}C$ |         | 95   |     | A                |
| $V_{TO}$    | threshold voltage                            | for power-loss calculations only   | $T_{VJ} = T_{VJM}$      |         | 1.01 |     | V                |
| $r_T$       | slope resistance                             |  |                         |         | 2.85 |     | m $\Omega$       |
| $R_{thJC}$  | thermal resistance junction to case          |  |                         | 0.10    | 0.45 |     | K/W              |
| $R_{thCH}$  | thermal resistance junction to heatsink      |  |                         |         |      |     | K/W              |
| $P_{tot}$   |  |  | $T_C = 25^{\circ}C$     |         | 280  |     | W                |
| $I_{FSM}$   | max. surge forward current                   | t = 10 ms (50 Hz), sine<br>t = 8.3 ms (60 Hz), sine<br>t = 10 ms (50 Hz), sine<br>t = 8.3 ms (60 Hz), sine | $T_{VJ} = 45^{\circ}C$  |         | 1200 |     | A                |
|             |  |  |                         |         | 1300 |     | A                |
|             |  |  | $T_{VJ} = 150^{\circ}C$ |         | 1080 |     | A                |
|             |  |  |                         |         | 1170 |     | A                |
| $I^2t$      | $I^2t$ value for fusing                      | t = 10 ms (50 Hz), sine<br>t = 8.3 ms (60 Hz), sine<br>t = 10 ms (50 Hz), sine<br>t = 8.3 ms (60 Hz), sine | $T_{VJ} = 45^{\circ}C$  |         | 7200 |     | A <sup>2</sup> s |
|             |  |  |                         |         | 7100 |     | A <sup>2</sup> s |
|             |  |  | $T_{VJ} = 150^{\circ}C$ |         | 5800 |     | A <sup>2</sup> s |
|             |  |  |                         |         | 5700 |     | A <sup>2</sup> s |
| $t_{rr}$    | max. reverse recovery current                | $I_F = 95 A; V_R = 300 V$  | $T_{VJ} = 25^{\circ}C$  |         | 55   | 100 | ns               |
|             |  |  | $T_{VJ} = 100^{\circ}C$ |         | 110  | 150 | ns               |
| $I_{RM}$    | reverse recovery time                        | -di/dt = 400 A/ $\mu$ s; L $\leq$ 0.05 $\mu$ H   | $T_{VJ} = 25^{\circ}C$  |         | 11   | 15  | A                |
|             |  |  | $T_{VJ} = 100^{\circ}C$ |         | 21   | 25  | A                |

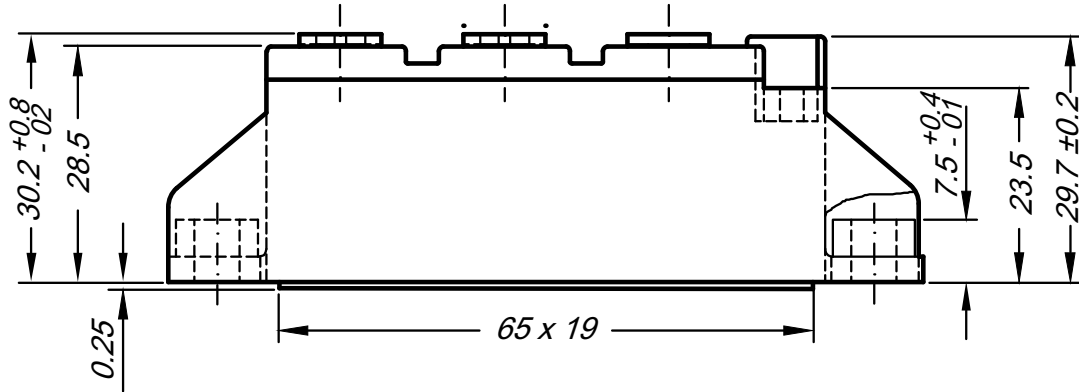
①  $I_{FAVM}$  rating includes reverse blocking losses at  $T_{VJM}$ ,  $V_R = 0.8 V_{RRM}$ , duty cycle d = 0.5



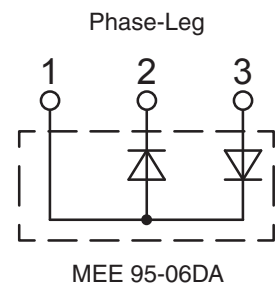
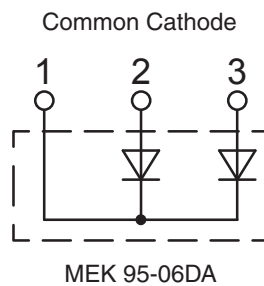
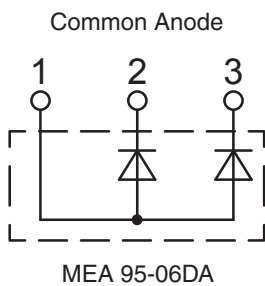
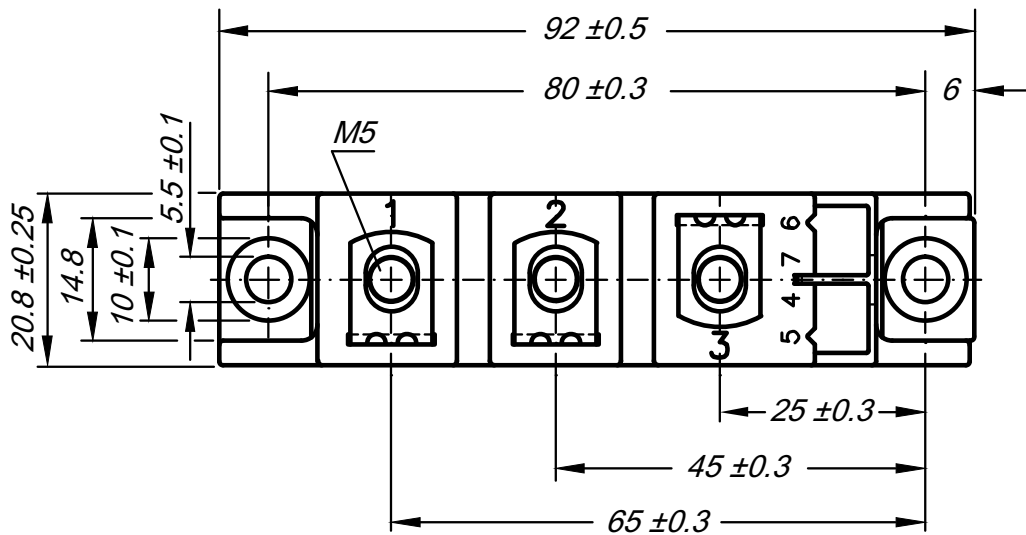
| Package TO-240AA |  |                      | Ratings                             |      |      |    |
|------------------|--|----------------------|-------------------------------------|------|------|----|
| Symbol           | Definitions  | Conditions           | min.                                | typ. | max. |    |
| $I_{RMS}$        | RMS current  | per terminal         |                                     |      | 200  | A  |
| $T_{VJ}$         | virtual junction temperature                                 |                      | -40                                 |      | 150  | °C |
| $T_{op}$         | operation temperature  |                      | -40                                 |      | 125  | °C |
| $T_{stg}$        | storage temperature  |                      | -40                                 |      | 125  | °C |
| <b>Weight</b>    |  |                      |                                     | 76   |      | g  |
| $M_D$            | mounting torque  |                      | 2.5                                 |      | 4    | Nm |
| $M_T$            | terminal torque  |                      | 2.5                                 |      | 4    | Nm |
| $d_{Spp/App}$    | creepage distance on surface   striking distance through air | terminal to terminal | 13.0                                | 9.7  |      | mm |
| $d_{Spb/Appb}$   |  | terminal to backside | 16.0                                | 16.0 |      | mm |
| $V_{ISOL}$       | isolation voltage  | t = 1 second         | 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA |      | 4800 | V  |
|                  |  | t = 1 minute         |                                     |      | 4000 | V  |



| Ordering | Part Name   | Marking on Product | Delivering Mode | Base Qty | Ordering Code |
|----------|-------------|--------------------|-----------------|----------|---------------|
| Standard | MEA 95-06DA | MEA 95-06DA        | Box             | 36       | 467286        |
| Standard | MEK 95-06DA | MEK 95-06DA        | Box             | 36       | 466492        |
| Standard | MEE 95-06DA | MEE 95-06DA        | Box             | 36       | 468568        |

**Outlines TO-240AA**


General tolerance: DIN ISO 2768 class „c“



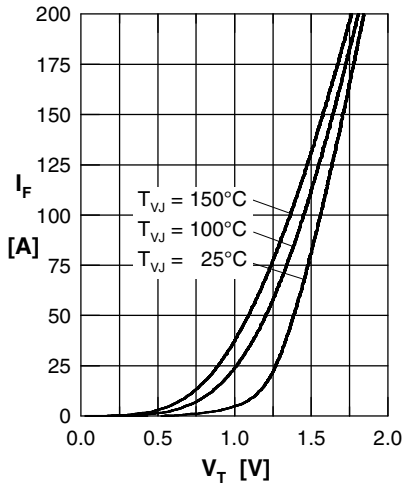
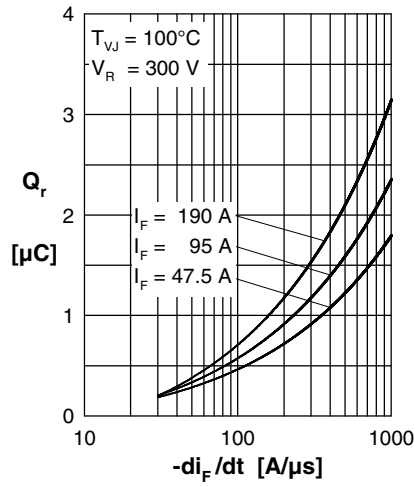
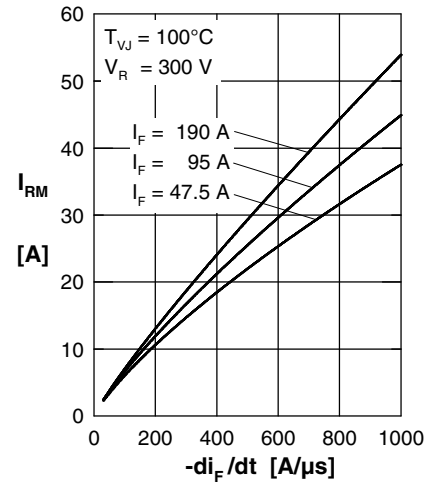
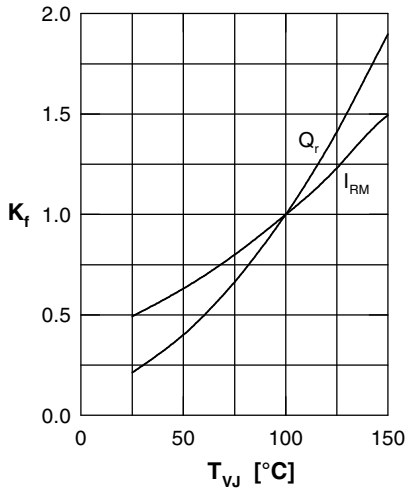
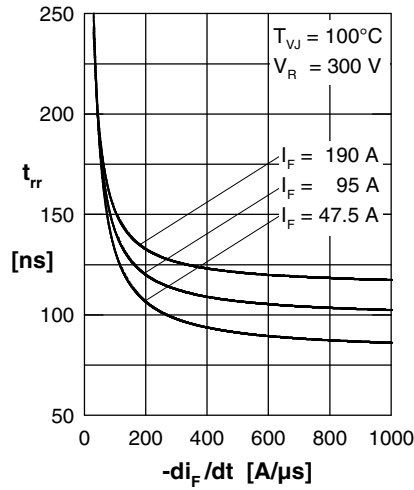
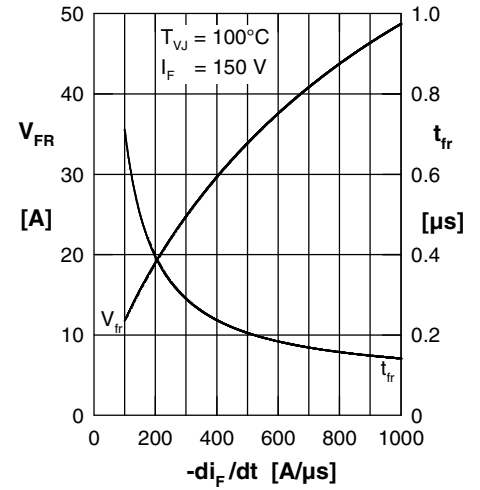
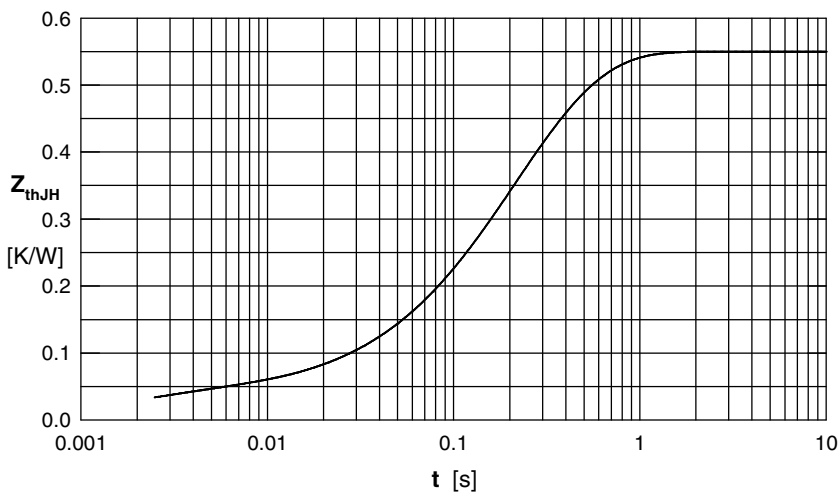
**Curves**

 Fig. 1 Typ. forward current  $I_F$  vs. voltage drop  $V_T$  per leg

 Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$ 

 Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$ 

 Fig. 4 Typ. dynamic parameters  $Q_r$ ,  $I_{RM}$  vs. junction temperature  $T_{VJ}$ 

 Fig. 5 Typ. recovery time  $t_{tr}$  vs.  $-di_F/dt$ 

 Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{tr}$  versus  $di_F/dt$ 


Fig. 7 Typ. transient thermal impedance junction to heatsink

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.037           | 0.002     |
| 2 | 0.138           | 0.134     |
| 3 | 0.093           | 0.250     |
| 4 | 0.282           | 0.274     |