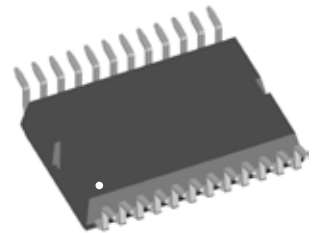
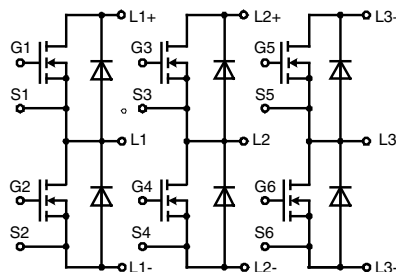


# Three phase full Bridge

with Trench MOSFETs  
in DCB isolated high current package

$V_{DSS} = 55 \text{ V}$   
 $I_{D25} = 150 \text{ A}$   
 $R_{DSon \text{ typ.}} = 2.2 \text{ m}\Omega$



| MOSFETs   |   | Maximum Ratings |   |
|-----------|---|-----------------|---|
| Symbol    | Conditions  |                 |   |
| $V_{DSS}$ | $T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$ | 55              | V |
| $V_{GS}$  |   | $\pm 20$        | V |
| $I_{D25}$ | $T_C = 25^\circ\text{C}$                          | 150             | A |
| $I_{D90}$ | $T_C = 90^\circ\text{C}$                          | 115             | A |
| $I_{F25}$ | $T_C = 25^\circ\text{C (diode)}$                  | 140             | A |
| $I_{F90}$ | $T_C = 90^\circ\text{C (diode)}$                  | 90              | A |

### Applications

- AC drives
- in automobiles
    - electric power steering
    - starter generator
  - in industrial vehicles
    - propulsion drives
    - fork lift drives
  - in battery supplied equipment

| Symbol          | Conditions   | Characteristic Values        |      |      |               |
|-----------------|--|------------------------------|------|------|---------------|
|                 |  | min.                         | typ. | max. |               |
| $R_{DSon}^{1)}$ | on chip level at }<br>$V_{GS} = 10 \text{ V}$  | $T_{VJ} = 25^\circ\text{C}$  | 2.2  | 3.1  | m $\Omega$    |
|                 |  | $T_{VJ} = 125^\circ\text{C}$ | 3.7  | 5.3  | m $\Omega$    |
| $V_{GS(th)}$    | $V_{DS} = 20 \text{ V}; I_D = 1 \text{ mA}$  |                              | 2.0  | 4.0  | V             |
| $I_{DSS}$       | $V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}$   | $T_{VJ} = 25^\circ\text{C}$  |      | 1    | $\mu\text{A}$ |
|                 |  | $T_{VJ} = 125^\circ\text{C}$ |      | 50   | $\mu\text{A}$ |
| $I_{GSS}$       | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$  |                              |      | 0.2  | $\mu\text{A}$ |
| $Q_g$           | } $V_{GS} = 10 \text{ V}; V_{DS} = 28 \text{ V}; I_D = 100 \text{ A}$  |                              | 110  |      | nC            |
| $Q_{gs}$        |  |                              | 35   |      | nC            |
| $Q_{gd}$        |  |                              | 25   |      | nC            |
| $t_{d(on)}$     | } inductive load<br>$V_{GS} = 10 \text{ V}; V_{DS} = 24 \text{ V}$<br>$I_D = 100 \text{ A}; R_G = 39 \Omega;$<br>$T_J = 125^\circ\text{C}$ |                              | 100  |      | ns            |
| $t_r$           |  |                              | 110  |      | ns            |
| $t_{d(off)}$    |  |                              | 500  |      | ns            |
| $t_f$           |  |                              | 100  |      | ns            |
| $E_{on}$        |  |                              | 0.12 |      | mJ            |
| $E_{off}$       |  |                              | 0.53 |      | mJ            |
| $E_{recoff}$    |  | 0.01                         |      | mJ   |               |
| $R_{thJC}$      |  |                              |      | 1.0  | K/W           |
| $R_{thJH}$      | with heat transfer paste (IXYS test setup)   |                              | 1.3  | 1.6  | K/W           |

### Features

- MOSFETs in trench technology:
  - low  $R_{DSon}$
  - optimized intrinsic reverse diode
- package:
  - high level of integration
  - high current capability
  - aux. terminals for MOSFET control
  - terminals for soldering or welding connections
  - isolated DCB ceramic base plate with optimized heat transfer
- Space and weight savings

<sup>1)</sup>  $V_{DS} = I_D \cdot (R_{DS(on)} + 2R_{Pin \text{ to chip}})$

Recommended replacement: MTI120WX55GD

**Source-Drain Diode**

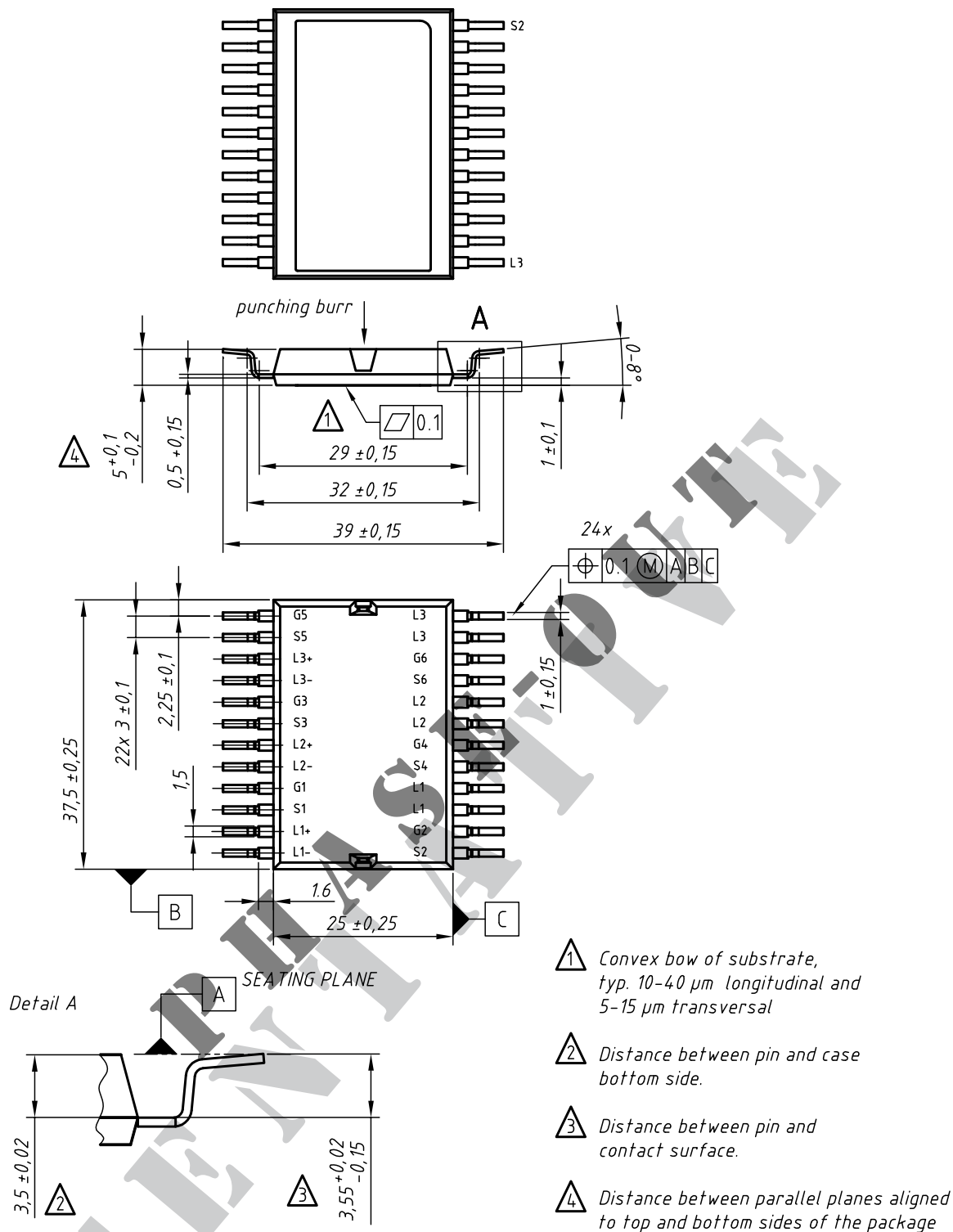
| Symbol  | Conditions   | Characteristic Values |      |      |    |
|---|--|-----------------------|------|------|----|
|   |  | min.                  | typ. | max. |    |
| (T <sub>J</sub> = 25°C, unless otherwise specified) |  |                       |      |      |    |
| V <sub>SD</sub>                                     | (diode) I <sub>F</sub> = 80 A; V <sub>GS</sub> = 0 V   |                       | 0.9  | 1.2  | V  |
| t <sub>rr</sub>                                     | I <sub>F</sub> = 100 A; -di <sub>F</sub> /dt = 800 A/μs<br>V <sub>R</sub> = 24 V; T <sub>J</sub> = 125°C |                       | 38   |      | ns |
| Q <sub>RM</sub>                                     |  |                       | 0.45 |      | μC |
| I <sub>RM</sub>                                     |  |                       | 22   |      | A  |

**Component**

| Symbol            | Conditions  | Maximum Ratings |    |
|-------------------|---|-----------------|----|
| I <sub>RMS</sub>  | per pin in main current paths (P+, N-, L1, L2, L3)<br>may be additionally limited by external connections<br>2 pins for output L1, L2, L3 | 75              | A  |
| T <sub>J</sub>    |   | -55...+175      | °C |
| T <sub>stg</sub>  |   | -55...+125      | °C |
| V <sub>ISOL</sub> | I <sub>ISOL</sub> ≤ 1 mA, 50/60 Hz, f = 1 minute  | 1000            | V~ |
| F <sub>C</sub>    | mounting force with clip  | 50 - 250        | N  |

| Symbol                                 | Conditions  | Characteristic Values |      |      |
|--|---|-----------------------|------|------|
|  |   | min.                  | typ. | max. |
| R <sub>pin to chip</sub> <sup>1)</sup> |   |                       | tbd  | mΩ   |
| C <sub>P</sub>                         | coupling capacity between shorted<br>pins and back side metallization |                       | 160  | pF   |
| Weight                                 |   |                       | 25   | g    |

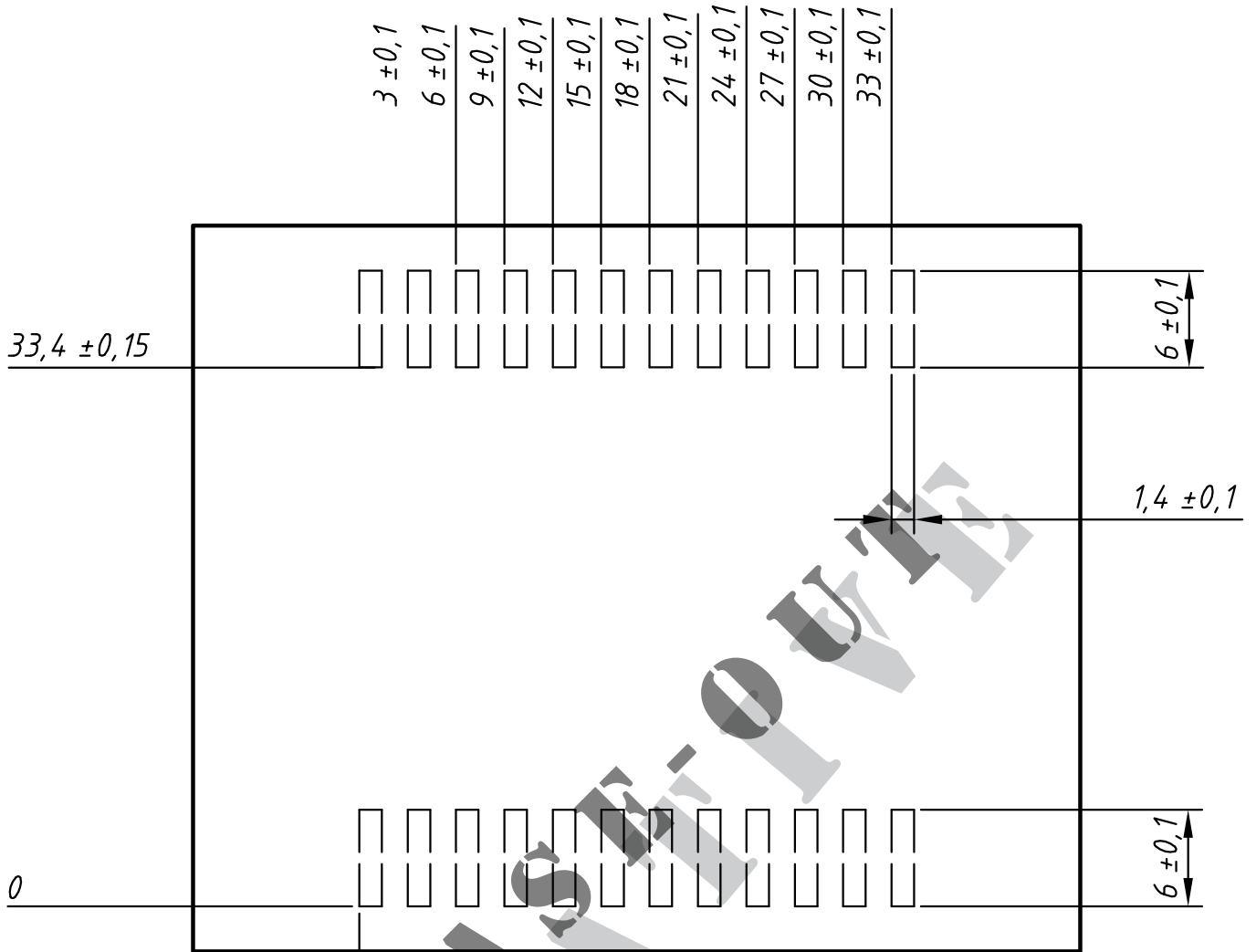
<sup>1)</sup> V<sub>DS</sub> = I<sub>D</sub> · (R<sub>DS(on)</sub> + 2R<sub>Pin to Chip</sub>)



contact pin:

- galv. tin plating, per pin side: Sn 10...25  $\mu\text{m}$ , undercoating Ni 0,2...1  $\mu\text{m}$
- stamping edges may be free of tin
- punching burr:  $\leq 0,05\text{mm}$

| Leads | Ordering | Part Name & Packing Unit Marking | Part Marking     | Delivering Mode | Base Qty. | Ordering Code |
|-------|----------|----------------------------------|------------------|-----------------|-----------|---------------|
| SMD   | Standard | GMM 3x160-0055X2 - SMD           | GMM 3x160-0055X2 | Blister         | 28        | 507 504       |



Remarks:

- 1) pin layout / dimensions are conditionally
- 2) soldering paste thickness:  $200\mu\text{m}$