



迈长铭科技

# MPBW15N120B

## 1200V 15A Trench and Field Stop IGBT

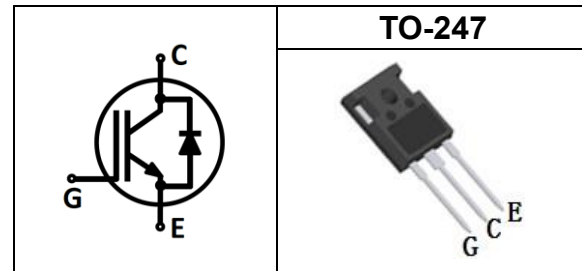
### Features

- High speed switching
- $V_{ce(sat)}$  with positive temperature coefficient
- High ruggedness, good thermal stability

### Application

- Inductive cooking
- microwave ovens
- Soft Switching

| Type        | Marking   | Package Code |
|-------------|-----------|--------------|
| MPBW15N120B | MP15N120B | TO-247       |



### Maximum Rated Values <sup>1</sup>

| Parameter   | Symbol    | Value             | Unit |
|---|-----------|-------------------|------|
| Collector-emitter voltage   | $V_{CE}$  | 1200              | V    |
| DC collector current <sup>2</sup>                                   | $I_C$     | $T_C=25^\circ C$  | A    |
|   |           | $T_C=100^\circ C$ |      |
| Pulsed collector current <sup>2</sup> , $t_p$ limited by $T_{jmax}$ |           | $I_{Cpuls}$       |      |
| Diode forward current <sup>2</sup>                                  | $I_F$     | $T_C=25^\circ C$  | A    |
|   |           | $T_C=100^\circ C$ |      |
| Diode pulsed current <sup>2</sup> , $t_p$ limited by $T_{jmax}$     |           | $I_{Fpuls}$       |      |
| Gate-emitter voltage  | $V_{GE}$  | $\pm 20$          | V    |
| Power dissipation   | $P_{tot}$ | $T_C=25^\circ C$  | W    |
|   |           | $T_C=100^\circ C$ |      |
| Operating junction temperature                                      |           | $T_j$             |      |
| Storage temperature   | $T_{stg}$ | -55~150           |      |

1: Reference standard: JESD-022 2: Limited by  $T_{jmax}$

## Thermal Characteristics

| Parameter                              | Symbol     | Condition | Max | Unit |
|--|------------|-----------|-----|------|
| IGBT thermal resistance, junction-case | $R_{thJC}$ |           | 0.7 | K/W  |
| Thermal Resistance, junction-ambient   | $R_{thJA}$ |           | 40  |      |

## Electrical Characteristics (at $T_j=25^\circ\text{C}$ , unless otherwise specified)

### Static Characteristics

| Parameter                            | Symbol        | Condition  | Min  | Typ | Max       | Unit |
|--------------------------------------|---------------|--|------|-----|-----------|------|
| Collector-emitter breakdown voltage  | $V_{(BR)CES}$ | $V_{GE}=0V, I_C=0.25mA$  | 1200 | -   | -         | V    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=15A$<br>$T_j=25^\circ\text{C}$                                | -    | 1.9 | 2.3       |      |
| G-E threshold voltage                | $V_{GE(th)}$  | $I_C=0.5mA, V_{CE}=V_{GE}$   | 4.5  | 5.5 | 6.5       |      |
| C-E leakage current                  | $I_{CES}$     | $V_{CE}=1200V, V_{GE}=0V$<br>$T_j=25^\circ\text{C}$<br>$T_j=150^\circ\text{C}$ | -    | -   | 0.01<br>1 | mA   |
| G-E leakage current                  | $I_{GES}$     | $V_{CE}=0V, V_{GE}=20V$  | -    | -   | 100       | nA   |

### Dynamic Characteristics

| Parameter                    | Symbol    | Condition                               | Min | Typ  | Max | Unit |
|------------------------------|-----------|---|-----|------|-----|------|
| Input capacitance            | $C_{iss}$ | $V_{CE}=25V,$                           | -   | 2527 | -   | pF   |
| Output capacitance           | $C_{oss}$ | $V_{GE}=0V,$                            | -   | 50   | -   |      |
| Reverse transfer capacitance | $C_{rss}$ | $f=1MHz$                                | -   | 21   | -   |      |
| Gate charge                  | $Q_G$     | $V_{CC}=600V, I_C=15A,$<br>$V_{GE}=15V$ | -   | 71   | -   | nC   |

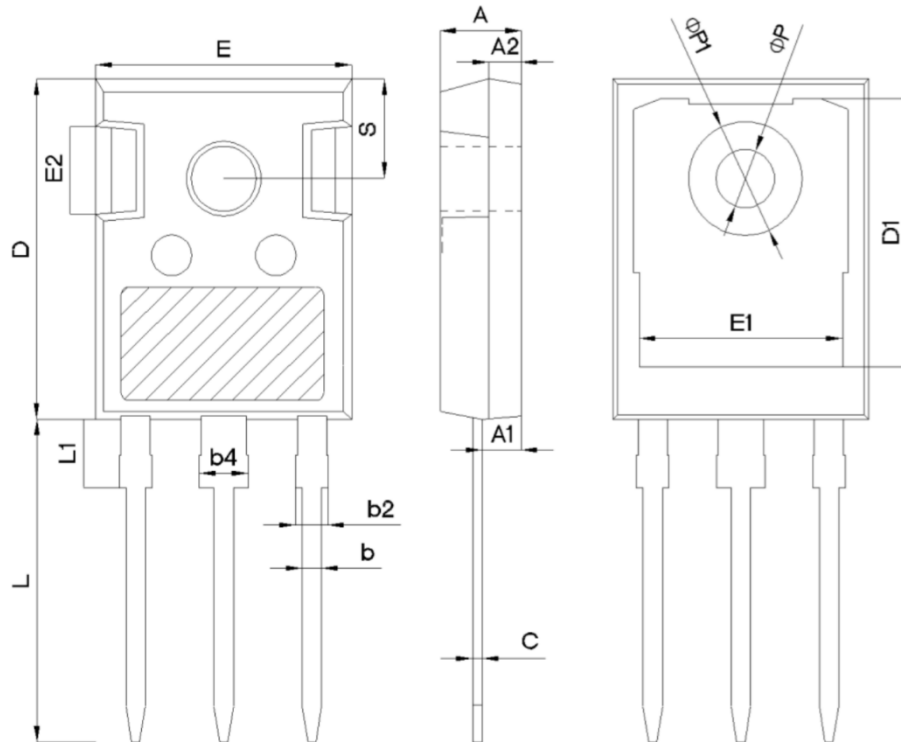
**IGBT Switching Characteristics**

| Parameter           | Symbol       | Condition  | Min | Typ  | Max | Unit |
|---------------------|--------------|--|-----|------|-----|------|
| Turn-off delay time | $t_{d(off)}$ | $T_j=25^\circ\text{C}$ , $V_{CC}=600\text{V}$ ,<br>$I_C=15\text{A}$ , $V_{GE}=0/15\text{V}$ ,<br>$R_G=10\ \Omega$ ,<br>Inductive load  | -   | 170  | -   | ns   |
| Fall time           | $t_f$        |  | -   | 157  | -   | ns   |
| Turn-off energy     | $E_{off}$    |  | -   | 0.89 | -   | mJ   |
| Turn-off delay time | $t_{d(off)}$ | $T_j=150^\circ\text{C}$ , $V_{CC}=600\text{V}$ ,<br>$I_C=15\text{A}$ , $V_{GE}=0/15\text{V}$ ,<br>$R_G=10\ \Omega$ ,<br>Inductive load | -   | -    | -   | ns   |
| Fall time           | $t_f$        |  | -   | -    | -   | ns   |
| Turn-off energy     | $E_{off}$    |  | -   | -    | -   | mJ   |

**Diode Characteristics**

| Parameter             | Symbol | Condition                            | Min | Typ | Max | Unit |
|-----------------------|--------|--------------------------------------|-----|-----|-----|------|
| Diode forward voltage | $V_F$  | $V_{GE}=0\text{V}$ , $I_F=4\text{A}$ | -   | 2.0 | -   | V    |

TO-247



| SYMBOL | mm      |       |       |
|--------|---------|-------|-------|
|        | MIN     | NOM   | MAX   |
| A      | 4.80    | 5.00  | 5.20  |
| A1     | 2.21    | 2.41  | 2.61  |
| A2     | 1.85    | 2.00  | 2.15  |
| b      | 1.11    | 1.21  | 1.36  |
| b2     | 1.91    | 2.01  | 2.21  |
| b4     | 2.91    | 3.01  | 3.21  |
| c      | 0.51    | 0.61  | 0.75  |
| D      | 20.70   | 21.00 | 21.30 |
| D1     | 16.25   | 16.55 | 16.85 |
| E      | 15.50   | 15.80 | 16.10 |
| E1     | 13.00   | 13.30 | 13.60 |
| E2     | 4.80    | 5.00  | 5.20  |
| E3     | 2.30    | 2.50  | 2.70  |
| e      | 5.44BSC |       |       |
| L      | 19.62   | 19.92 | 20.22 |
| L1     | -       | -     | 4.30  |
| ΦP     | 3.40    | 3.60  | 3.80  |
| ΦP1    | -       | -     | 7.30  |
| S      | 6.15BSC |       |       |

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