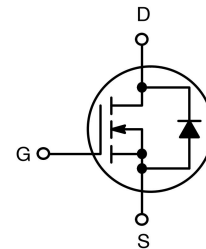
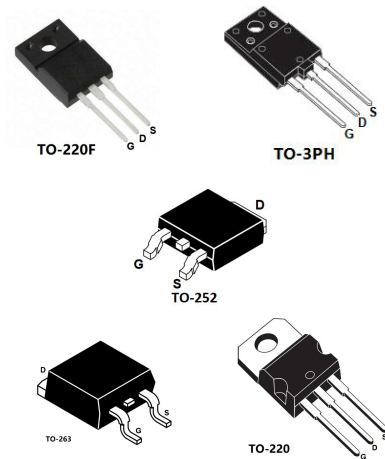


## General features

| Type      | V <sub>DSS</sub> (@T <sub>Jmax</sub> ) | R <sub>DS(on)</sub> | I <sub>D</sub> |
|-----------|--|---------------------|----------------|
| MS5N100   | 1000 V                                 | < 4.2 Ω             | 5A             |
| MS5N100S  | 1000 V                                 | < 4.2 Ω             | 5A             |
| MS5N100FT | 1000 V                                 | < 4.2 Ω             | 5A             |
| MS5N100FE | 1000 V                                 | < 4.2 Ω             | 5A             |
| MS5N100FD | 1000 V                                 | < 4.2 Ω             | 5A             |

- Extremely high dv/dt capability
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatability



## Applications

- Switching application

## Order codes

| Partnumber | Marking   | Package      |
|------------|-----------|--------------|
| MS5N100    | MS5N100   | TO-3PH       |
| MS5N100S   | MS5N100S  | TO-220F      |
| MS5N100FT  | MS5N100FT | TO-220       |
| MS5N100FE  | MS5N100FE | TO-263/D2PAK |
| MS5N100FD  | MS5N100FD | TO-252/DPAK  |

## Electrical ratings

### Absolute maximum ratings

| Parameter                                 | Symbol          | Value  |          |                   |        | Unit |
|---|-----------------|--------|----------|-------------------|--------|------|
|   |                 | TO-3PH | TO-220FP | TO-220/<br>TO-252 | TO-263 |      |
| Drain-source voltage (V <sub>GS</sub> =0) | V <sub>DS</sub> | 1000   |          |                   |        | V    |
| Gate-source voltage                       | V <sub>GS</sub> | ±30    |          |                   |        |      |
| Drain current (continuous) at TC=25°C     | I <sub>D</sub>  | 5      |          |                   |        | A    |
| Drain current (continuous) at TC=100°C    | I <sub>D</sub>  | 3      |          |                   |        |      |
| Drain current (pulsed)                    | I <sub>DM</sub> | 18     | 18       | 18                | 18     |      |
| Total dissipation at TC=25°C              | PTOT            | 125    | 30       | 68                | 56     | W    |
| Derating factor                           |                 | 1      | 0.24     | 1                 | 0.63   | W/°C |

|   |               |            |      |
|---|---------------|------------|------|
| Drain source ESD<br>(HBM-C=100pF,R=1.5KΩ)   | $V_{ESD(GS)}$ | 4000       | V    |
| Peak diode recovery voltage<br>slope  | dv/dt         | 4.5        | V/ns |
| Insulation withstand<br>voltage(RMS)from all three<br>leads to external heat sink<br>(t=1s TC=25°C) | $V_{ISO}$     | 2500       | v    |
| Operating junction temperature  | $T_J$         | -55 to 175 | °C   |
| Storage temperature   | $T_{STG}$     |            |      |

### Thermal data

| Parameter   | Symbol    | Value    |        |                   |        | Unit |
|---|-----------|----------|--------|-------------------|--------|------|
|   |           | TO-220FP | TO-3PH | TO-220/<br>TO-252 | TO-263 |      |
| Thermal resistance junction<br>max                | Rthj-case | 4.2      | 1      | 1                 | 0.86   | °C/W |
| Thermal resistance<br>junction-ambient max        | Rthj-case | 5        |        |                   |        | A    |
| Maximum lead temperature<br>for soldering purpose | T         | 350      |        |                   |        | mJ   |

### Avalanche characteristics

| Parameter   | Symbol   | Value | Unit |
|---|----------|-------|------|
| Avalanche current repetitive or not-repetitive<br>(pulse width limited by Tj Max) | $I_{AR}$ | 5     | A    |
| Single pulse avalanche energy<br>(starting Tj=25°C Id=Iar Vdd=50V)                | $E_{AS}$ | 350   | mJ   |

**Electrical characteristics** ( $T_{CASE}=25^{\circ}C$  unless otherwise specified)

**On/off states**

| Parameter   | Symbol        | Test conditions                | Min  | Typ | Max      | Unit     |
|---|---------------|--------------------------------|------|-----|----------|----------|
| Drain-source breakdown voltage                    | $V_{(BR)DSS}$ | $I_D=1mA$ $V_{GS}=0$           | 1000 |     |          | V        |
| Zero gate voltage drain current<br>( $V_{GS}=0$ ) | $I_{DSS}$     | $V_{DS}=\text{Max rating}$     |      |     | 1        | $\mu A$  |
|   |               | $T_C=125^{\circ}C$             |      |     | 50       | $\mu A$  |
| Gate body leakage current ( $V_{GS}=0$ )          | $I_{GSS}$     | $V_{GS}=\pm 20V$               |      |     | $\pm 10$ | $\mu A$  |
| Gate threshold voltage                            | $V_{GS(th)}$  | $V_{DS}=V_{GS}$ $I_D=100\mu A$ | 3    | 3.5 | 4.5      | V        |
| Static drain-source on resistance                 | $R_{DS(on)}$  | $V_{GS}=10V$ $I_D=1.75A$       |      | 3.5 | 4.2      | $\Omega$ |

**Dynamic**

| Parameter                     | Symbol        | Test conditions  | Min | Typ  | Max | Unit     |
|-------------------------------|---------------|--|-----|------|-----|----------|
| Forward transconductance      | $g_{fs}$      | $V_{DS} = 15 V, I_D = 1.75A$   |     | 3    |     | S        |
| Input capacitance             | $C_{iss}$     | $V_{DS}=25V, f=1MHz, V_{GS}=0$                                       |     | 1154 |     | pF       |
| Output capacitance            | $C_{oss}$     |  |     | 106  |     |          |
| Reverse transfer capacitance  | $C_{rss}$     |  |     | 21.3 |     |          |
| Equivalent Output capacitance | $C_{oss eq.}$ | $V_{GS}=0, V_{DS}=0$ to 800V   |     | 46.8 |     |          |
| Gate input resistance         | $R_g$         | $f=1MHz$ Gate DC Bias=0<br>Test signal level=20mV<br>open drain      |     | 2.2  |     | $\Omega$ |
| Total gate charge             | $Q_g$         | $V_{DD}=800V, I_D=3.5A$<br>$V_{GS}=10V$                              |     | 42   |     | nC       |
| Gate-source charge            | $Q_{gs}$      |  |     | 7.3  |     |          |
| Gate-drain charge             | $Q_{gd}$      |  |     | 21.7 |     |          |
| Turn-on delay time            | $t_{d(on)}$   | $V_{DD} = 500 V, I_D = 1.75 A,$<br>$R_G = 4.7 \Omega, V_{GS} = 10 V$ |     | 22.5 |     | ns       |
| Rise time                     | $t_r$         |  |     | 7.7  |     |          |
| Turn-off-delay time           | $t_{d(off)}$  |  |     | 51.5 |     |          |
| Fall time                     | $t_f$         |  |     | 19   |     |          |

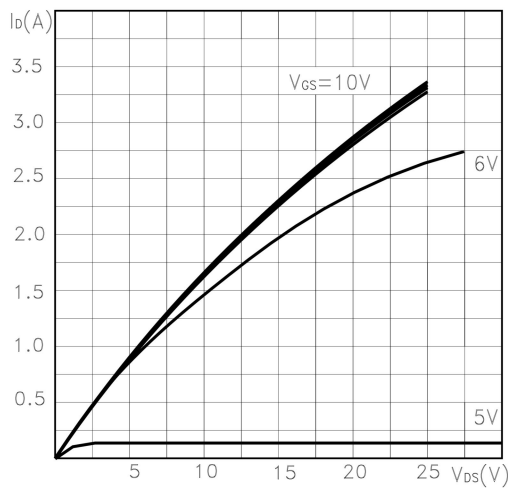
**Source Drain Diode**

| Parameter            | Symbol   | Test conditions | Min | Typ | Max | Unit |
|----------------------|----------|-----------------|-----|-----|-----|------|
| Source Drain Current | $I_{SD}$ |                 |     |     | 5   | A    |

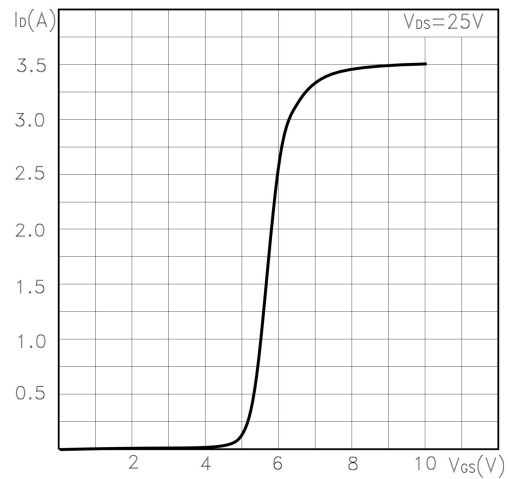
|                              |           |                               |     |     |         |
|------------------------------|-----------|-------------------------------|-----|-----|---------|
| Source Drain Current(Pulsed) | $I_{SDM}$ |                               |     | 20  | A       |
| Forward On Voltage           | $V_{SD}$  | $I_{SD}=5A, V_{GS}=0V$        |     | 1.2 | V       |
| Reverse Recovery Time        | $T_{rr}$  | $I_{SD}=4A, di/dt=100A/\mu S$ | 500 |     | ns      |
| Reverse Recovery Charge      | $Q_{rr}$  | $V_R=100V, T_j=150^\circ C$   | 4.3 |     | $\mu C$ |
| Reverse Recovery Current     | $I_{RRM}$ |                               | 20  |     | A       |

## Electrical characteristics (curves)

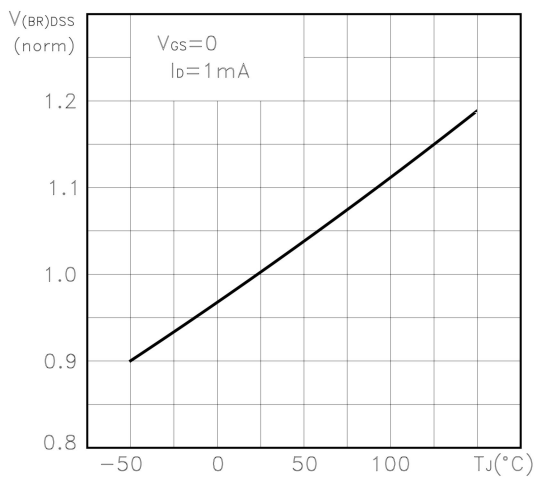
### Output characteristics



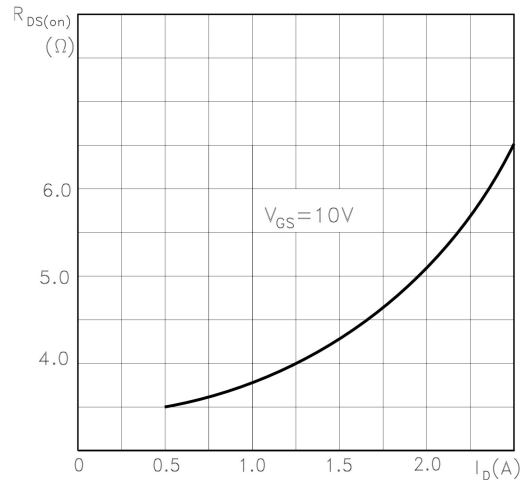
### Transfer characteristics



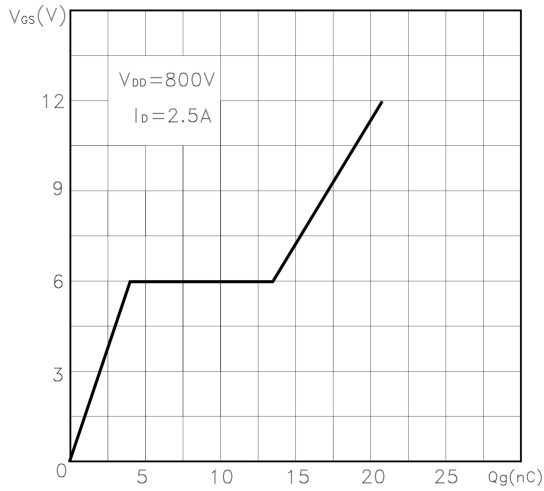
### Normalized $BV_{DSS}$ vs. temperature



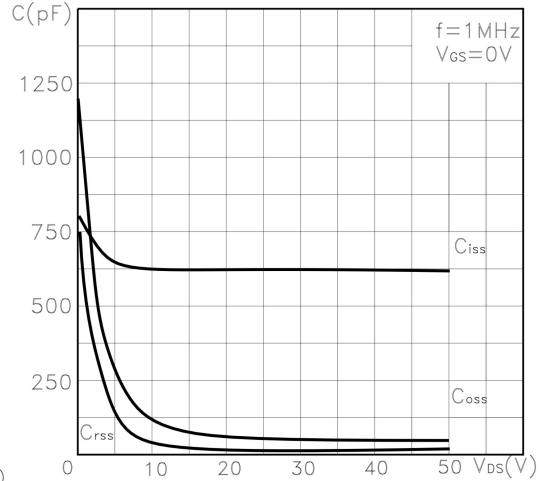
### Static drain-source on resistance



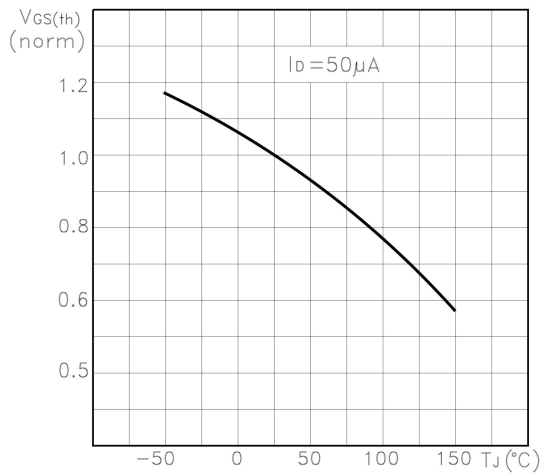
**Gate charge vs. gate-source voltage**



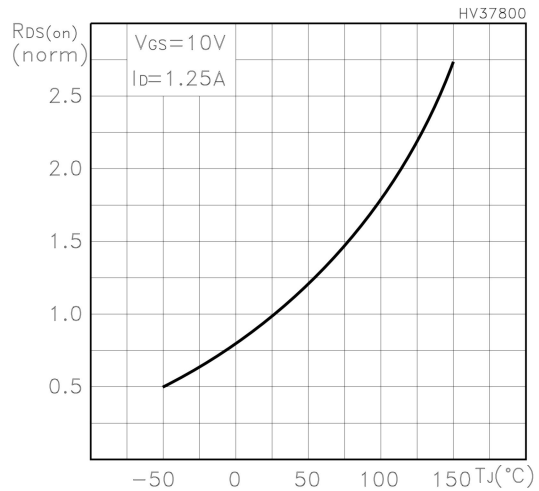
**Capacitance variations**



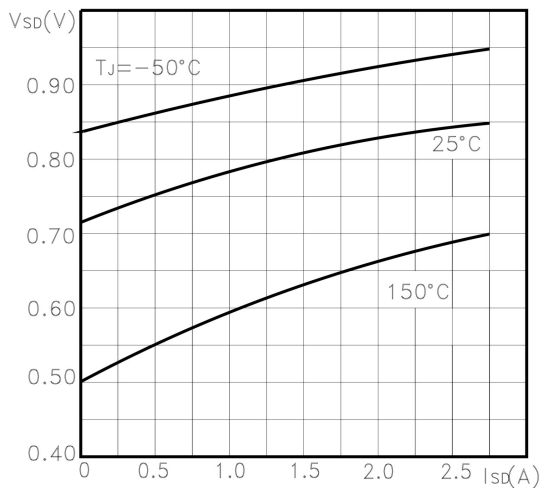
**Normalized gate threshold voltage vs. temperature**



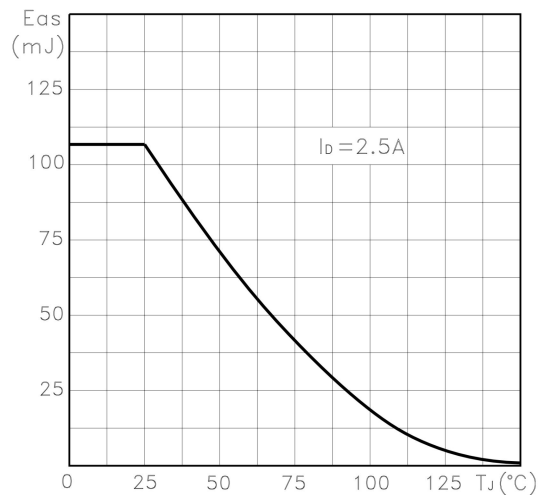
**Normalized on resistance vs. temperature**



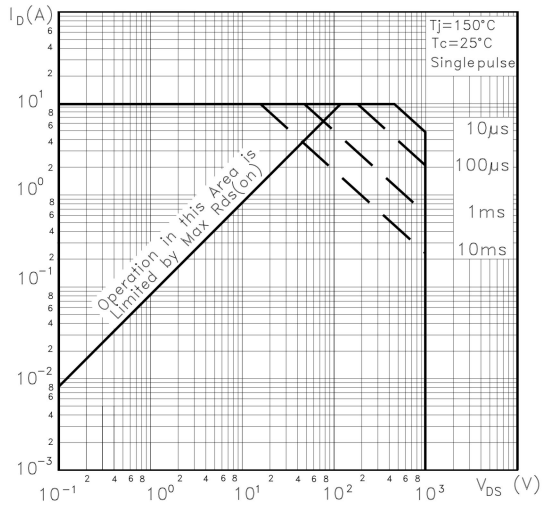
**Source-drain diode forward characteristics**



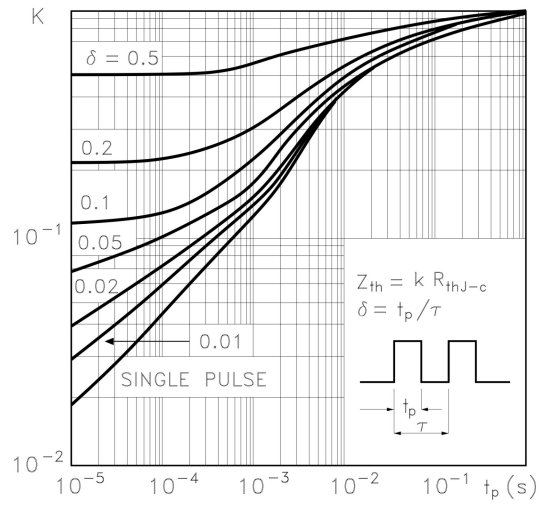
**Maximum avalanche energy vs Tj**



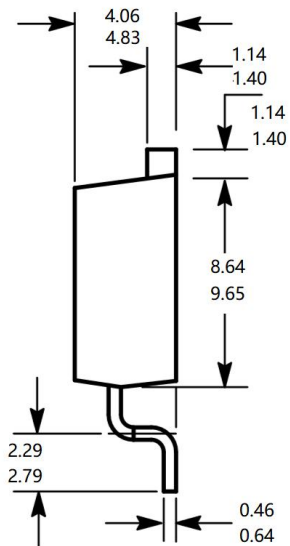
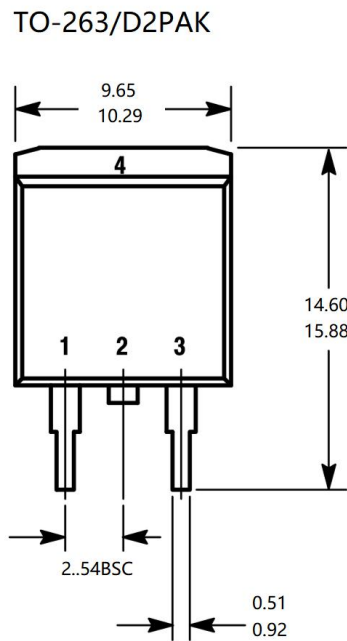
### Safe operating area



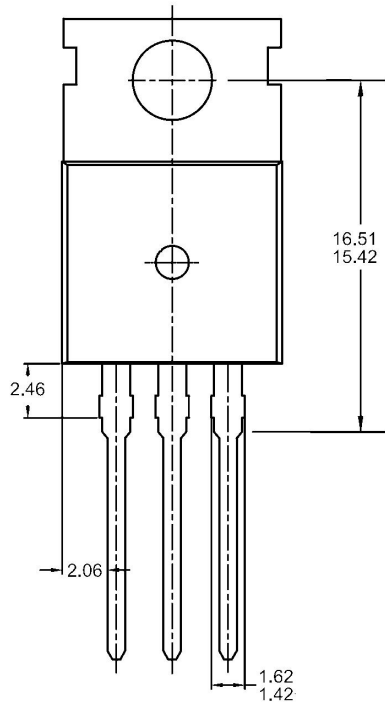
### Thermal impedance



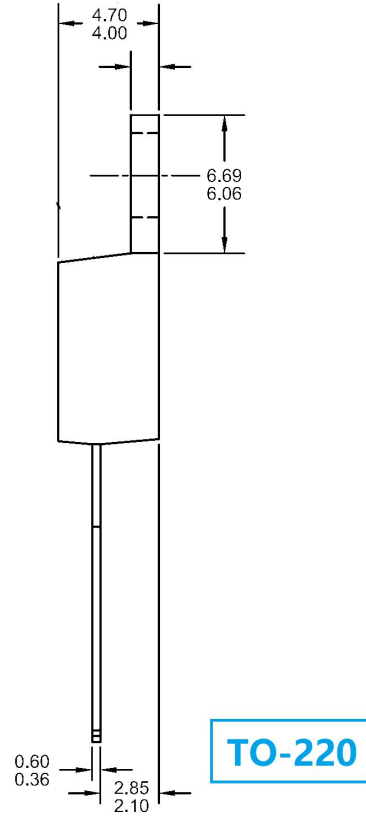
### Package outline dimension



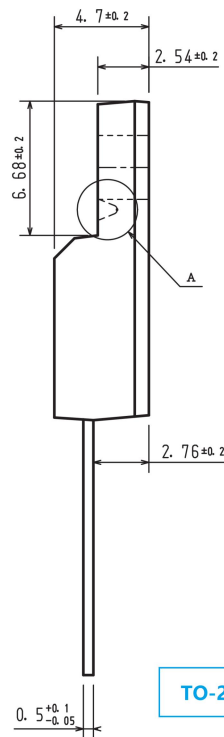
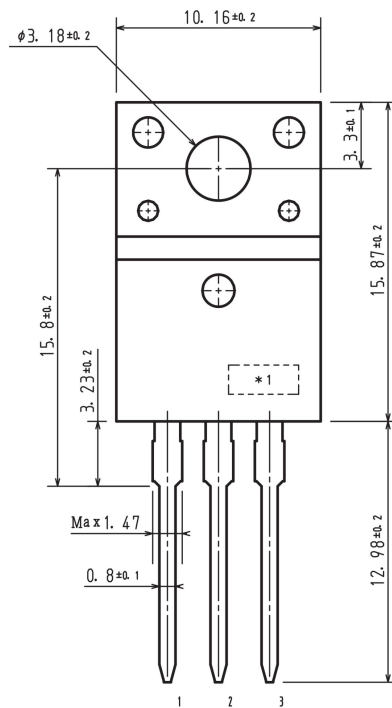
**TO-263/D2PAK**



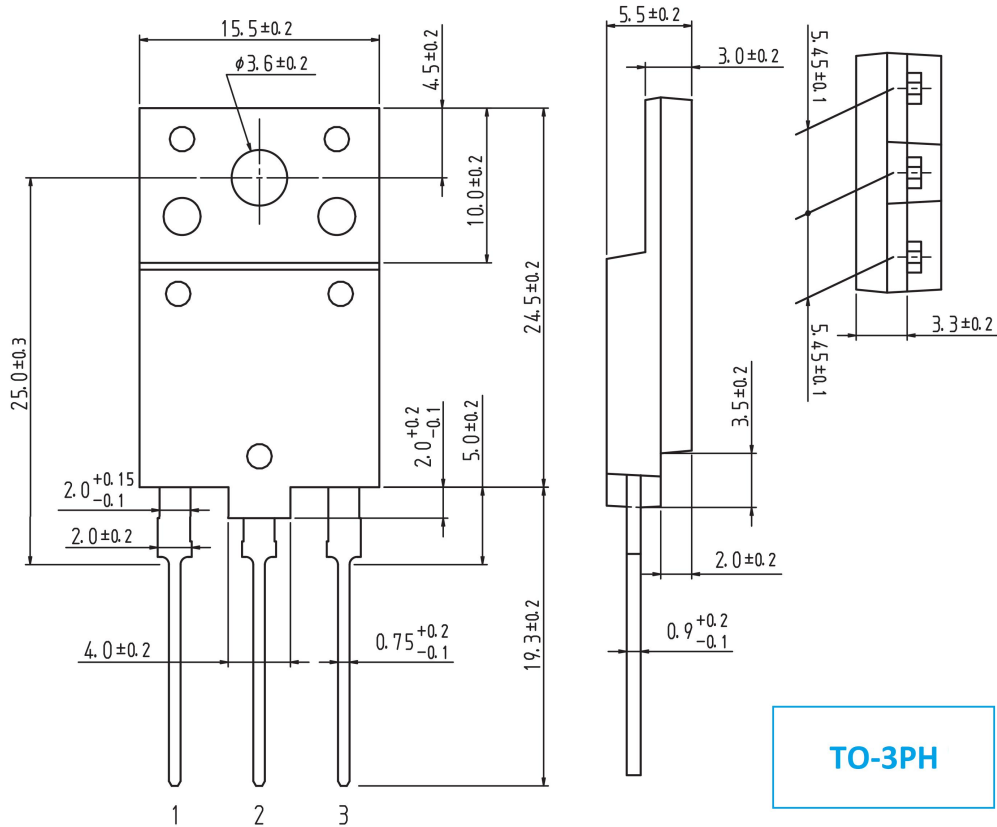
**TO-220**



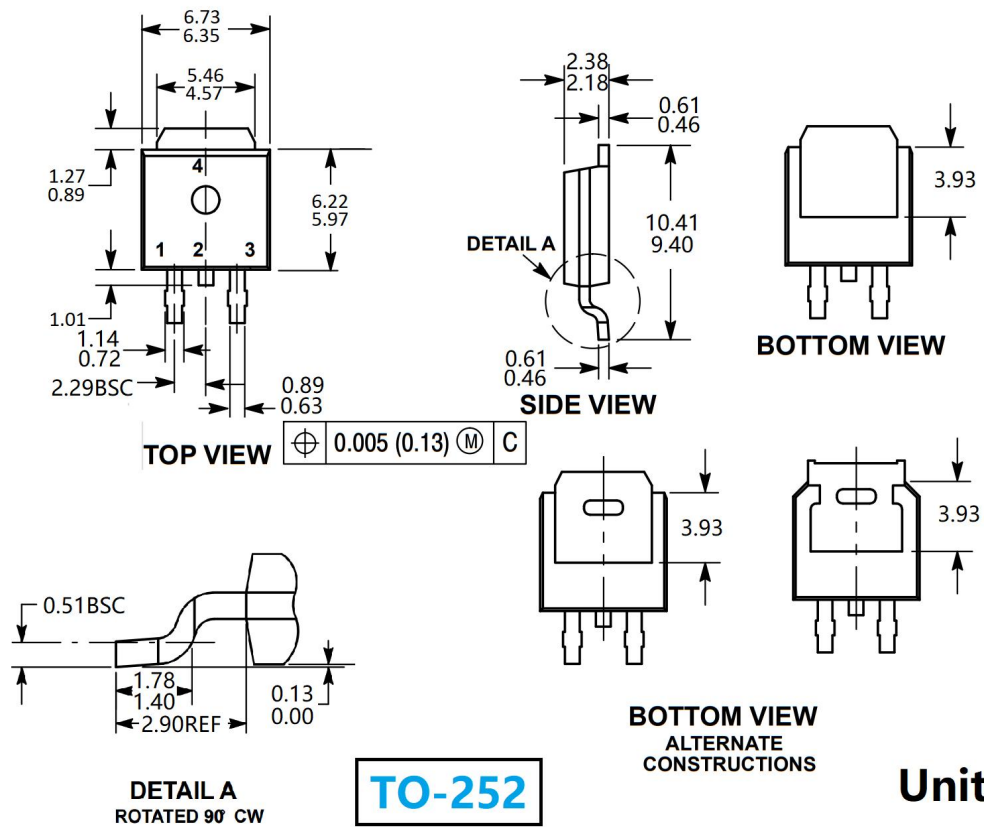
**TO-220**



**TO-220F**



**TO-3PH**



**TO-252**

**BOTTOM VIEW  
 ALTERNATE  
 CONSTRUCTIONS**

**Unit:mm**



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [MASPOWER](#) manufacturer:*

Other Similar products are found below :

[IRFD120](#) [IRFY240C](#) [JANTX2N5237](#) [BUK455-60A/B](#) [MIC4420CM-TR](#) [VN1206L](#) [NDP4060](#) [SI4482DY](#) [IPS70R2K0CEAKMA1](#)  
[SQD23N06-31L-GE3](#) [TK16J60W,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [DMN1053UCP4-7](#) [SQJ469EP-](#)  
[T1-GE3](#) [NTE2384](#) [DMC2700UDMQ-7](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#) [DMP22D4UFO-7B](#)  
[DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [IRF40H233XTMA1](#) [STU5N65M6](#) [DMN6022SSD-13](#) [DMN13M9UCA6-7](#)  
[DMTH10H4M6SPS-13](#) [DMN2990UFB-7B](#) [IPB80P04P405ATMA2](#) [2N7002W-G](#) [MCAC30N06Y-TP](#) [MCQ7328-TP](#) [NTMC083NP10M5L](#)  
[NVMFS2D3P04M8LT1G](#) [BXP7N65D](#) [BXP4N65F](#) [AOL1454G](#) [WMJ80N60C4](#) [BXP2N20L](#) [BXP2N65D](#) [BXT1150N10J](#) [BXT1700P06M](#)  
[TSM60NB380CP](#) [ROG](#) [RQ7L055BGTCR](#) [DMNH15H110SK3-13](#) [SLF10N65ABV2](#)