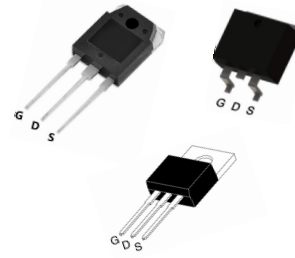


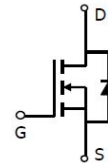
Features

- $V_{DS}=150V$
- $I_D=120A @V_{GS}=10V$
- Very low on-resistance $R_{DS(ON)}$
 $<7.2m\Omega @V_{GS}=10V$



Applications

Switching applications



Absolute Maximum Ratings($T_a=25^\circ C$)

| Characteristics | | Symbol | Rating | Unit |
|--|------------------------------------|----------------|----------|------------|
| Drain-source Voltage | | V_{DSS} | 150 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Continuous Drain Current ⁽¹⁾ | $T_C=25^\circ C$ (Silicon Limited) | I_D | 150 | A |
| | $T_C=25^\circ C$ (Package Limited) | | 120 | |
| | $T_C=100^\circ C$ | | 90 | |
| Pulsed Drain Current ⁽³⁾ | | I_{DM} | 460 | |
| Power Dissipation | $T_C=25^\circ C$ | P_D | 312 | W |
| | $T_C=100^\circ C$ | | 125 | |
| Single Pulse Avalanche Energy ⁽²⁾ | | E_{AS} | 520 | mJ |
| Junction and Storage Temperature Range | | T_J, T_{stg} | -55~150 | $^\circ C$ |

Thermal Characteristics

| Characteristics | Symbol | Rating | Unit |
|--|-----------------|--------|--------------|
| Thermal Resistance, Junction-to-Ambient ⁽¹⁾ | $R_{\theta JA}$ | 62.5 | $^\circ C/W$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.4 | |

Ordering Information

| Part Number | Temp. Range | Package | Packing | RoHS |
|-------------|--------------------|---------|---------|------|
| MS120N15FT | -55~150 $^\circ C$ | TO-220 | Tube | Free |
| MS120N15FE | -55~150 $^\circ C$ | TO-263 | Tube | Free |
| MS120N15FB | -55~150 $^\circ C$ | TO-3PB | Tube | Free |

Electrical Characteristics(T_J=25°C)

| Characteristics | Symbol | Test Condition | Min | Typ | Max | Unit |
|--|---------------------|--|-----|-------|------|------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =250UA,V _{GS} =0V | 150 | - | - | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} ,I _D =250uA | 1.8 | - | 3.9 | |
| Drain Cut-Off Current | I _{DSS} | V _{DS} =120V,V _{GS} =0V | - | - | 1 | uA |
| Gate Leakage Current | I _{GSS} | V _{GS} =±20V,V _{DS} =0V | - | - | ±0.1 | |
| Drain-Source ON Resistance | R _{DS(ON)} | V _{GS} =10V,I _D =50A | - | 5.8 | 7.2 | mΩ |
| Forward Transconductance | g _{fs} | V _{DS} =10V,I _D =100A | - | 68 | - | S |
| Dynamic Characteristics | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =50V,I _D =50A,V _{GS} =10V | - | 89 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 32 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 22 | - | |
| Input Capacitance | C _{iss} | V _{DS} =40V,V _{GS} =0V,f=1.0MHz | - | 6,180 | - | pF |
| Output Capacitance | C _{oss} | | - | 2,130 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 96 | - | |
| Turn-On Delay Time | t _{d(on)} | V _{GS} =10V,V _{DS} =50V,I _D =50A,R _G =3.0Ω | - | 39 | - | ns |
| Rise Time | t _r | | - | 26 | - | |
| Turn-Off Delay Time | t _{d(off)} | | - | 66 | - | |
| Fall Time | t _f | | - | 19 | - | |
| Gate Resistance | R _g | f=1MHz | - | 3.3 | - | Ω |
| Drain-Source Body Diode Characteristics | | | | | | |
| Source-Drain Diode Forward Voltage | V _{SD} | I _S =50A,V _{GS} =0V | - | 0.8 | 1.22 | V |
| Body Diode Reverse Recovery Time | t _{rr} | I _F =50A,di/dt=100A/us | - | 160 | - | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | | - | 627 | - | nC |

Electrical characteristics(Curves)

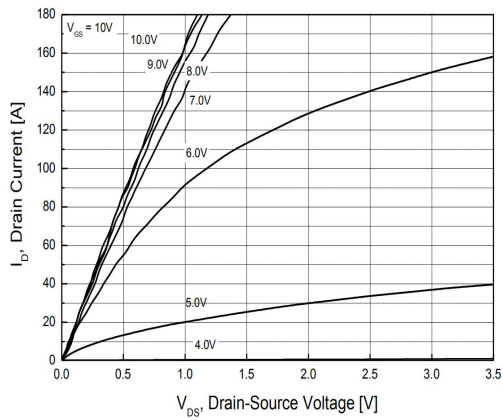


Fig.1 On-Region Characteristics

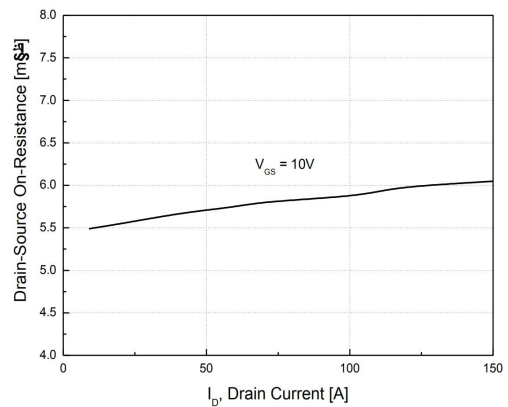


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

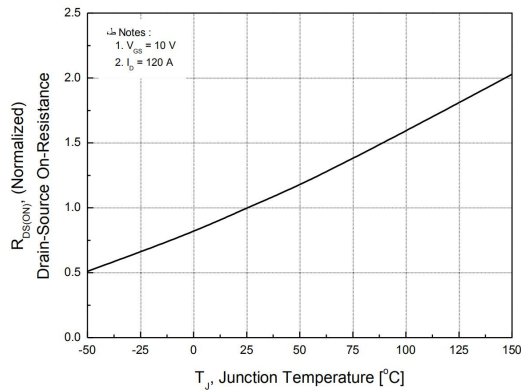


Fig.3 On-Resistance Variation with Temperature

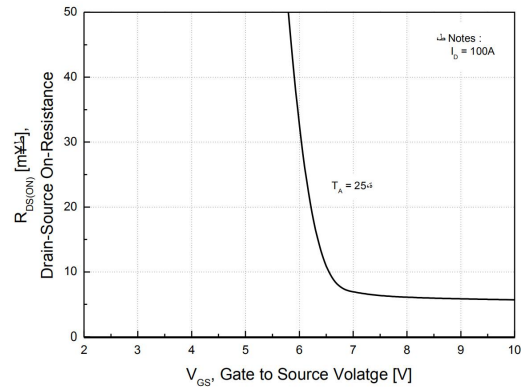


Fig.4 On-Resistance Variation with Gate to Source Voltage

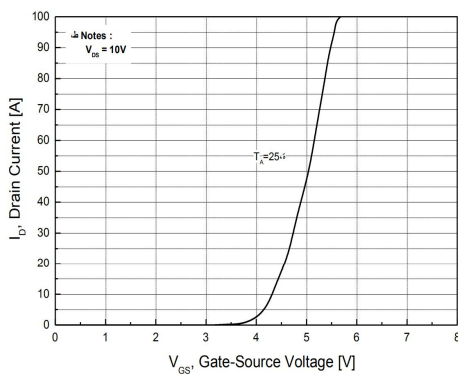


Fig.5 Transfer Characteristics

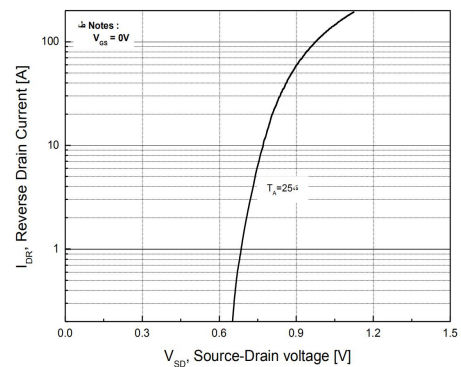


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

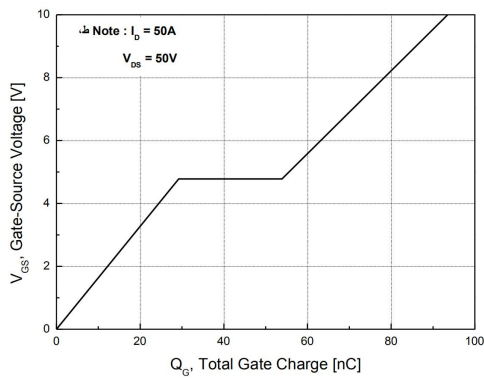


Fig.7 Gate Charge Characteristics

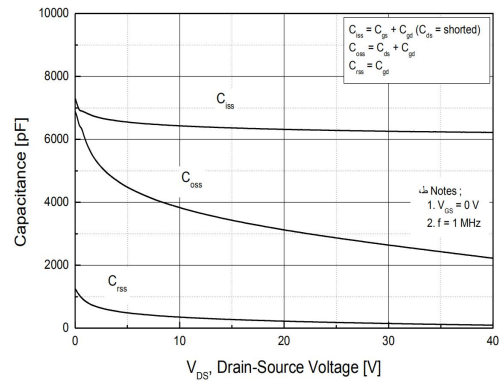


Fig.8 Capacitance Characteristics

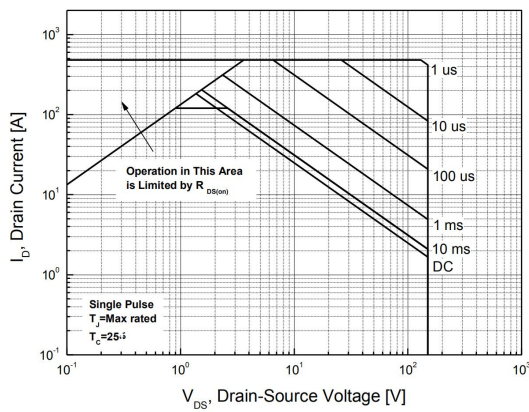


Fig.9 Maximum Safe Operating Area

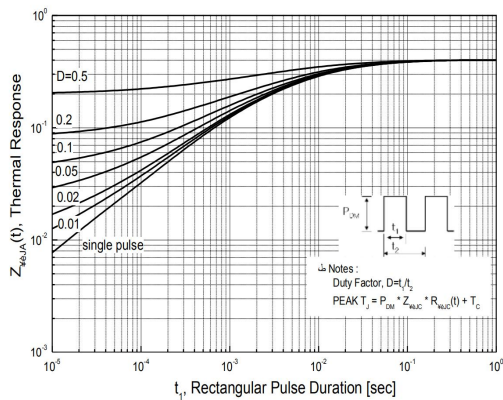
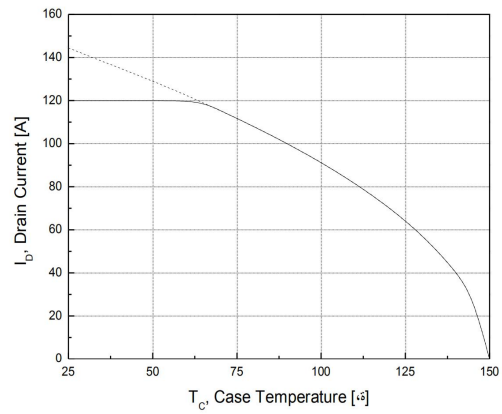
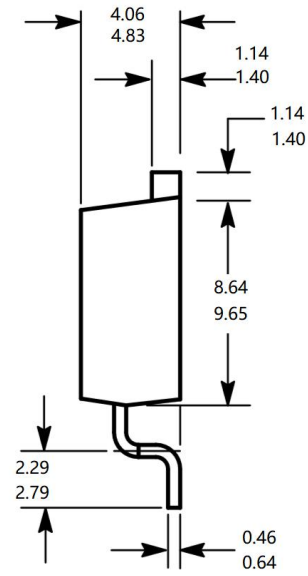
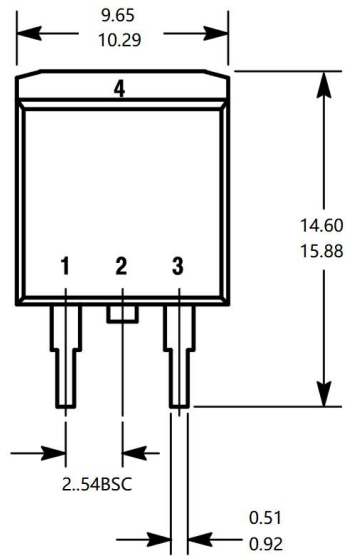


Fig.11 Transient Thermal Response Curve

Package

TO-263/D2PAK



TO-220

