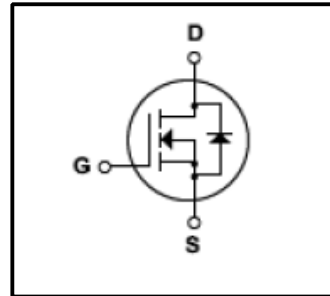


Silicon N-Channel MOSFET

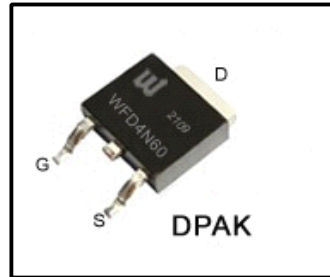
Features

- 4A,600V. $R_{DS(on)}$ (Max 2.5 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 16nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Isolation Voltage (VISO = 4000V AC)
- Maximum Junction Temperature Range(150 $^{\circ}C$)



General Description

This Power MOSFET is produced using Winsemi's advanced Planar stripe, DMOS technology. This latest technology has Been Especially designed to minimize on-state resistance, have a high Rugged avalanche characteristics. This devices is specially well Suited for half bridge and full bridge resonant topology line a Electronic lamp ballast.



Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|----------------|---|----------|----------------|
| V_{DSS} | Drain Source Voltage | 600 | V |
| I_D | Continuous Drain Current(@ $T_c=25^{\circ}C$) | 4 | A |
| | Continuous Drain Current(@ $T_c=100^{\circ}C$) | 2.5 | A |
| I_{DM} | Drain Current Pulsed (Note1) | 16 | A |
| V_{GS} | Gate to Source Voltage | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy (Note 2) | 240 | mJ |
| E_{AR} | Repetitive Avalanche Energy (Note 1) | 10 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (Note 3) | 4.5 | V/ns |
| P_D | Total Power Dissipation(@ $T_c=25^{\circ}C$) | 80 | W |
| | Derating Factor above 25 $^{\circ}C$ | 0.78 | W/ $^{\circ}C$ |
| T_J, T_{stg} | Junction and Storage Temperature | -55~150 | $^{\circ}C$ |
| T_L | Channel Temperature | 300 | $^{\circ}C$ |

Thermal Characteristics

| Symbol | Parameter | Value | | | Units |
|-----------|--|-------|-----|------|---------------|
| | | Min | Typ | Max | |
| R_{QJC} | Thermal Resistance, Junction-to-Case | - | - | 1.56 | $^{\circ}C/W$ |
| R_{QJA} | Thermal Resistance, Junction-to-Ambient* | | | 50 | |
| R_{QJA} | Thermal Resistance, Junction-to-Ambient | - | - | 110 | $^{\circ}C/W$ |

*When mounted on the minimum pad size recommended(PCB Mount)

Electrical Characteristics (Tc = 25° C)

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit | |
|---|----------------------|--|--|------|------|------|----|
| Gate leakage current | I _{GSS} | V _{GS} = ±30 V, V _{DS} = 0 V | - | - | ±100 | nA | |
| Gate-source breakdown voltage | V _{(BR)GSS} | I _G = ±10 μA, V _{DS} = 0 V | ±30 | - | - | V | |
| Drain cut-off current | I _{DSS} | V _{DS} = 600 V, V _{GS} = 0 V | - | - | 10 | μA | |
| | | V _{DS} = 480 V, T _c = 125°C | - | - | 100 | μA | |
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D = 250 μA, V _{GS} = 0 V | 600 | - | - | V | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = 10 V, I _D = 250 μA | 2 | - | 4 | V | |
| Drain-source ON resistance | R _{DS(ON)} | V _{GS} = 10 V, I _D = 3.25A | - | 1.8 | 2.5 | Ω | |
| Input capacitance | C _{iss} | V _{DS} = 25 V, | - | 545 | 670 | pF | |
| Reverse transfer capacitance | C _{rss} | V _{GS} = 0 V, | - | 7 | 10 | | |
| Output capacitance | C _{oss} | f = 1 MHz | - | 70 | 90 | | |
| Switching time | Rise time | t _r | V _{DD} = 300 V, I _D = 4.4 A R _G = 25 Ω (Note4,5) | - | 10 | 30 | ns |
| | Turn-on time | t _{on} | | - | 35 | 80 | |
| | Fall time | t _f | | - | 45 | 100 | |
| | Turn-off time | t _{off} | | - | 20 | 50 | |
| Total gate charge (gate-source plus gate-drain) | Q _g | V _{DD} = 480 V, V _{GS} = 10 V, I _D = 4.4A | - | 16 | 20 | nC | |
| Gate-source charge | Q _{gs} | (Note4,5) | - | 3.4 | - | | |
| Gate-drain ("miller") Charge | Q _{gd} | (Note4,5) | - | 7 | - | | |

Source-Drain Ratings and Characteristics (Ta = 25° C)

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit |
|----------------------------------|------------------|---|-----|------|------|------|
| Continuous drain reverse current | I _{DR} | - | - | - | 4 | A |
| Pulse drain reverse current | I _{DRP} | - | - | - | 17.6 | A |
| Forward voltage (diode) | V _{DSF} | I _{DR} = 4.4 A, V _{GS} = 0 V | - | - | 1.4 | V |
| Reverse recovery time | t _{rr} | I _{DR} = 4.4 A, V _{GS} = 0 V, | - | 390 | - | ns |
| Reverse recovery charge | Q _{rr} | dI _{DR} / dt = 100 A / μs | - | 2.2 | - | μC |

Note 1.Repeativity rating :pulse width limited by junction temperature

2.L=18.5mH,I_{AS}=4.4A,V_{DD}=50V,R_G=0Ω,Starting T_J=25°C

3.I_{SD}≤4A,dI/dt≤200A/us, V_{DD}<BV_{DSS},STARTING T_J=25°C

4.Pulse Test: Pulse Width≤300us,Duty Cycles≤2%

5.Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

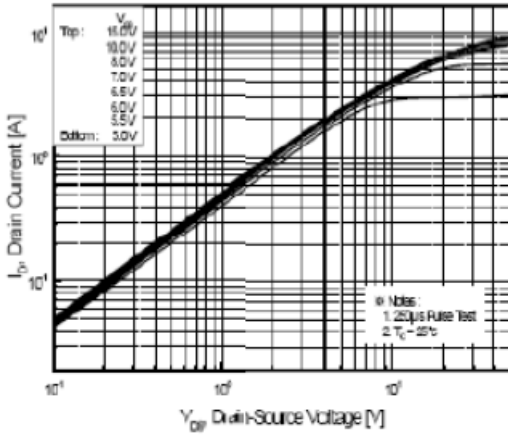


Fig.1 On-State Characteristics

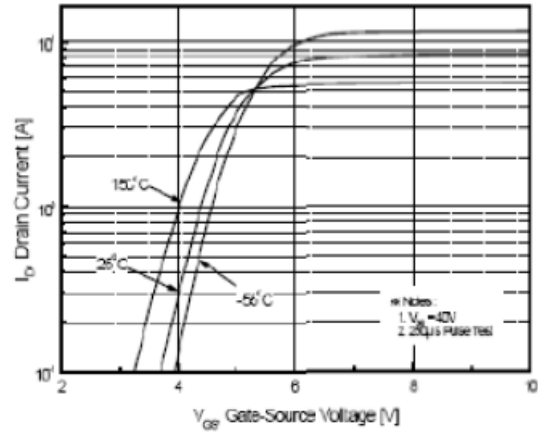


Fig.2 Transfer Current characteristics

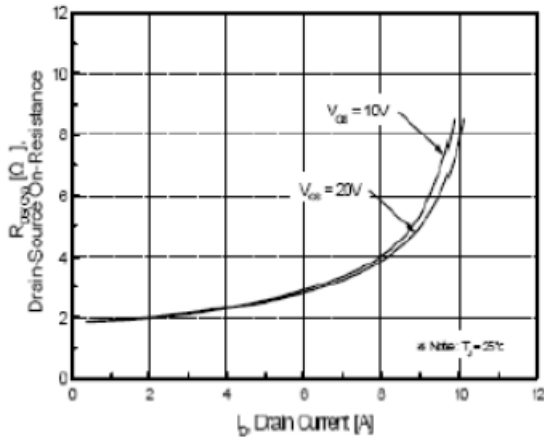


Fig.3. On Resistance Variation vs Drain current

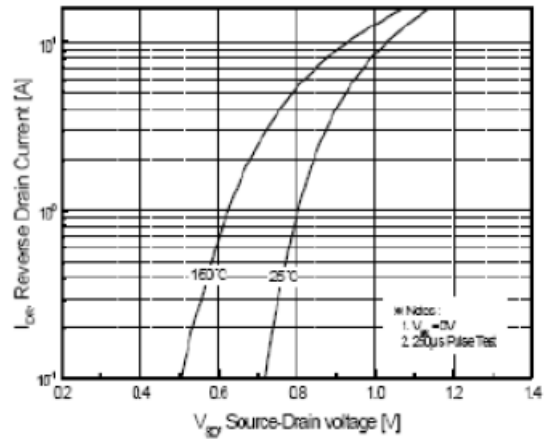


Fig.4 Body Diode Forward Voltage Variation vs Source Current and Temperature

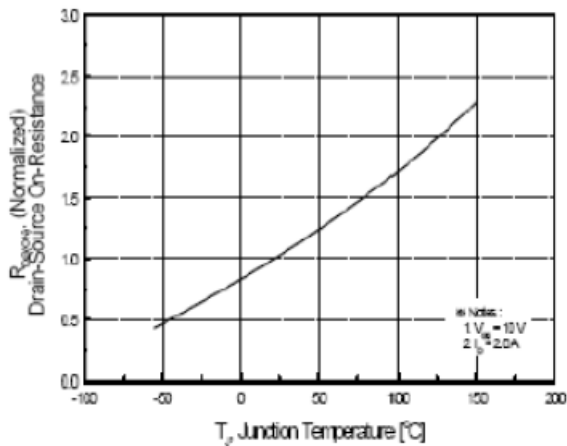


Fig.5 On-Resistance Variation vs Junction Temperature

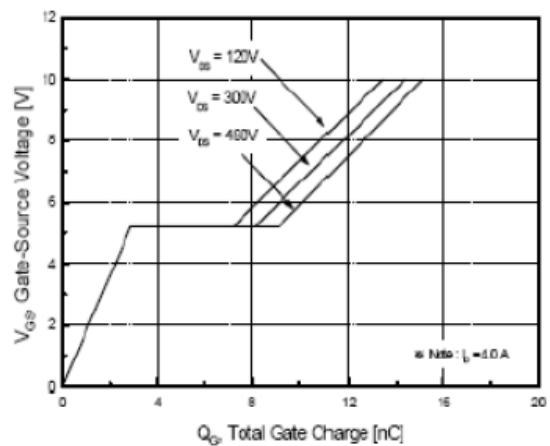


Fig.6 Gate Charge Characteristics

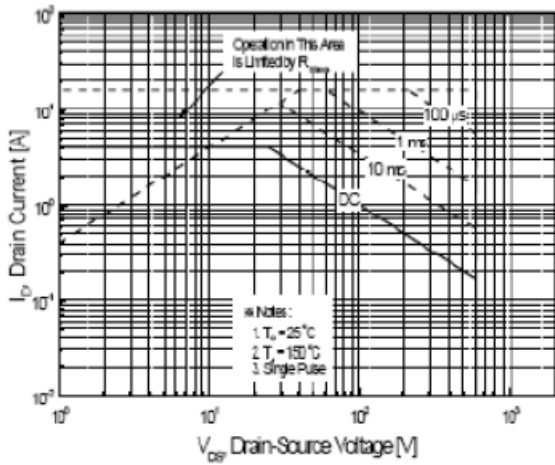


Fig.7 Maximum Safe Operation Area

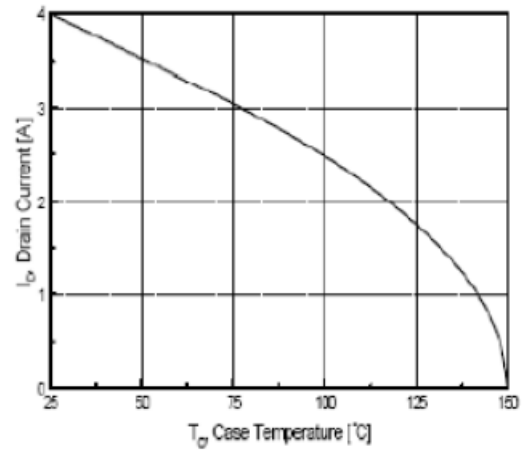


Fig.8 Maximum Drain Current vs Case Temperature

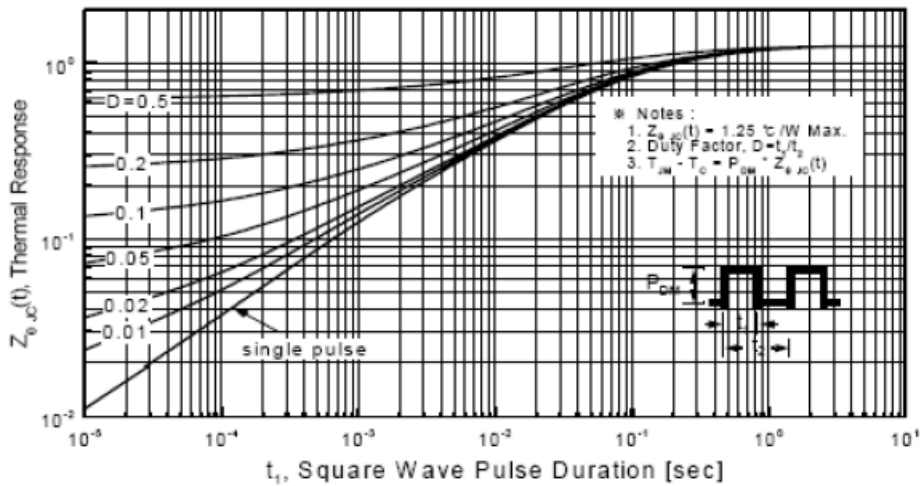


Fig.9 Transient Thermal Response curve

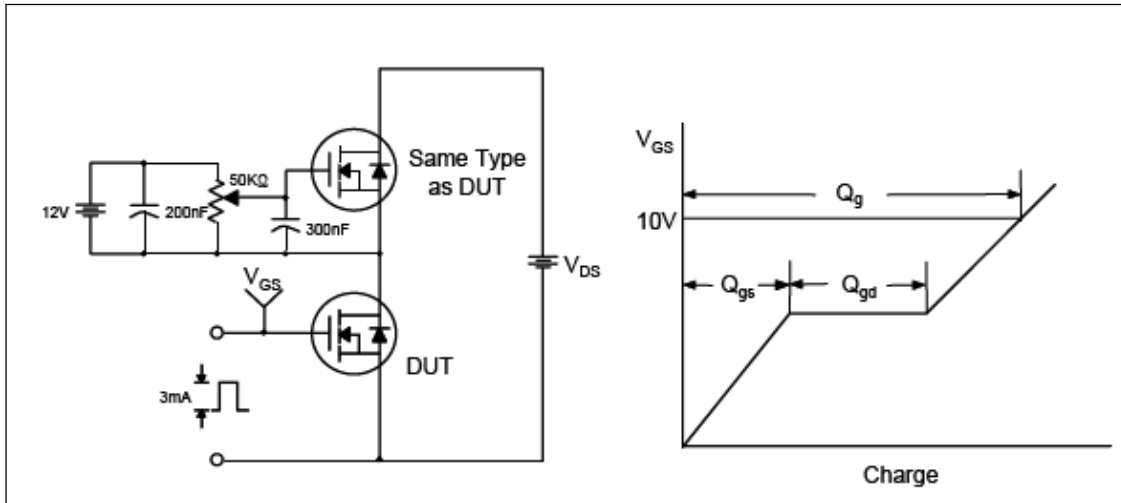


Fig.10 Gate Test Circuit & Waveform

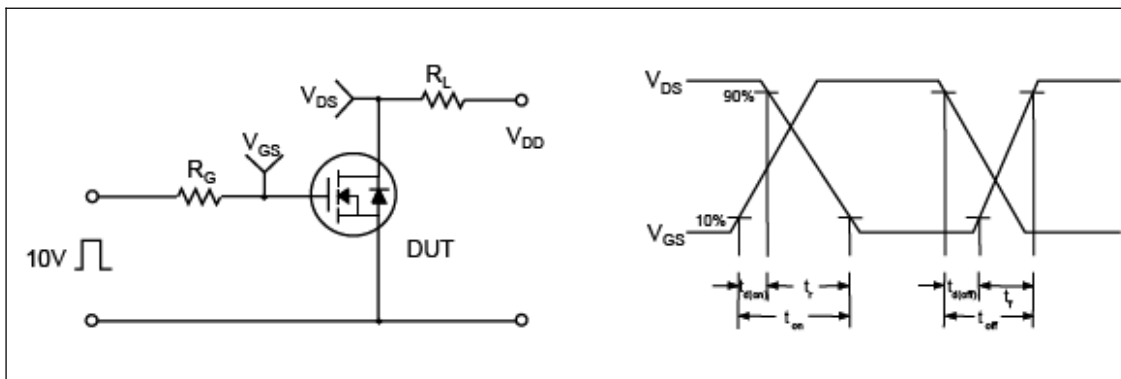


Fig.11 Resistive Switching Test Circuit & Waveform

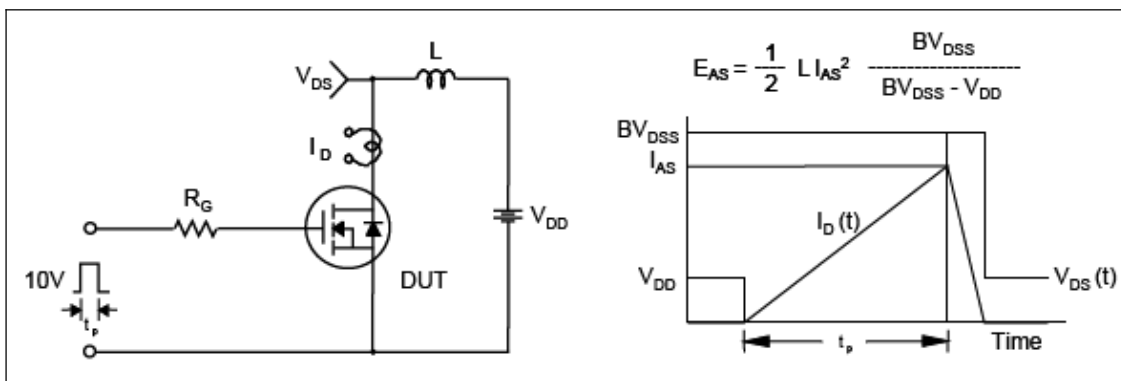


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

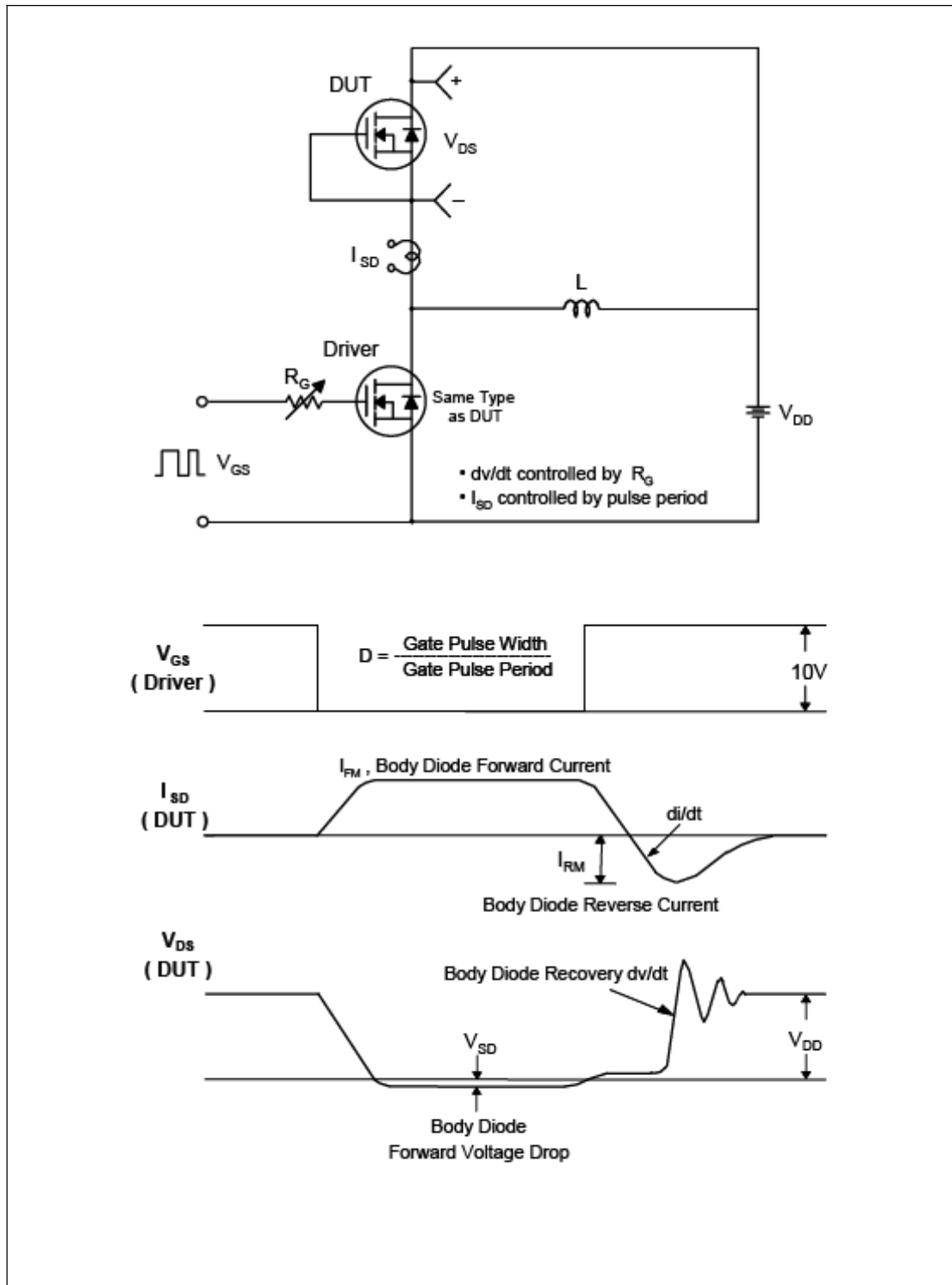


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-252 Package Dimension

Unit:mm

