

CMH52N20/CMA52N20

200V, 44mΩ typ., 52A N-Channel MOSFET

General Description

The 52N20 uses advanced planar stripe DMOS technology and design to provide excellent RDS(ON). These devices are well suited for high-efficiency switched mode power supplies and active power factor correction.

Features

- Improved dv/dt capability
- 100% avalanche tested
- RoHS Compliant

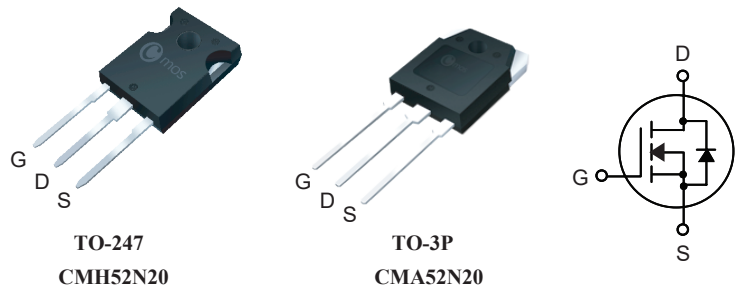
Product Summary

| BVDSS | R _{DS(on)} max. | ID |
|-------|--------------------------|-----|
| 200V | 50mΩ | 52A |

Applications

- Switch Mode Power Supply
- PFC

TO-247/TO-3P Pin Configuration



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---------------------------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | 200 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| I _D @T _C =25°C | Continuous Drain Current | 52 | A |
| I _D @T _C =100°C | Continuous Drain Current | 32 | A |
| I _{DM} | Pulsed Drain Current | 208 | A |
| EAS | Single Pulse Avalanche Energy (Note 1) | 3380 | mJ |
| P _D @T _C =25°C | Total Power Dissipation | 300 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|-------------------------------------|------|------|------|
| R _{θJA} | Thermal Resistance Junction-ambient | --- | 62.5 | °C/W |
| R _{θJC} | Thermal Resistance Junction-case | --- | 0.42 | °C/W |

Electrical Characteristics (T_J=25°C , unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|-----------------------------------|--|------|------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V , I _D =250uA | 200 | --- | --- | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V , I _D =26A | --- | 44 | 50 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250μA | 2.0 | --- | 4.0 | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =200V , V _{GS} =0V | --- | --- | 1 | uA |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} = ±20V , V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =15V , I _D =20A | --- | 30 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V , V _{GS} =0V , f=1MHz | --- | 0.9 | --- | Ω |
| Q _g | Total Gate Charge | V _{DS} =160V , I _D =50A V _{GS} =10V (note 2,3) | --- | 80 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 18.5 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 25.5 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =100V , I _D =50A R _G =25Ω (note 3) | --- | 57 | --- | ns |
| T _r | Rise Time | | --- | 28 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 169 | --- | |
| T _f | Fall Time | | --- | 44 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =25V , V _{GS} =0V , f=1MHz | --- | 3900 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 500 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 70 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|--|------|------|------|------|
| I _S | Continuous Source Current | V _G =V _D =0V , Force Current | --- | --- | 52 | A |
| I _{SM} | Pulsed Source Current | | --- | --- | 208 | A |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V , I _S =26A | --- | 0.87 | 1.5 | V |
| t _{rr} | Reverse Recovery Time | I _S = 50A , V _{GS} =0V | --- | 282 | --- | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt =100A/μs (note 2,3) | --- | 2.3 | --- | μC |

Note :

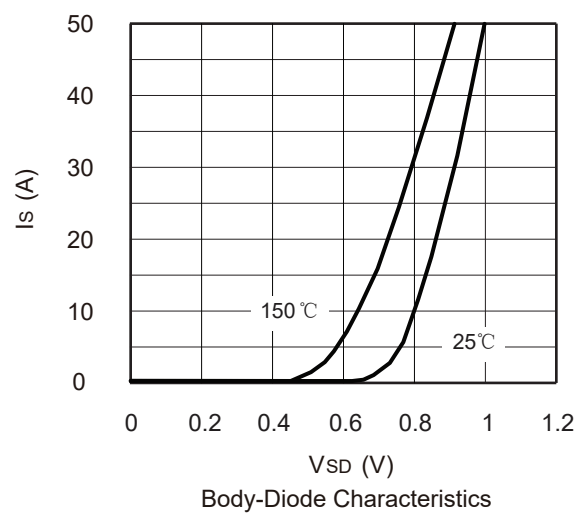
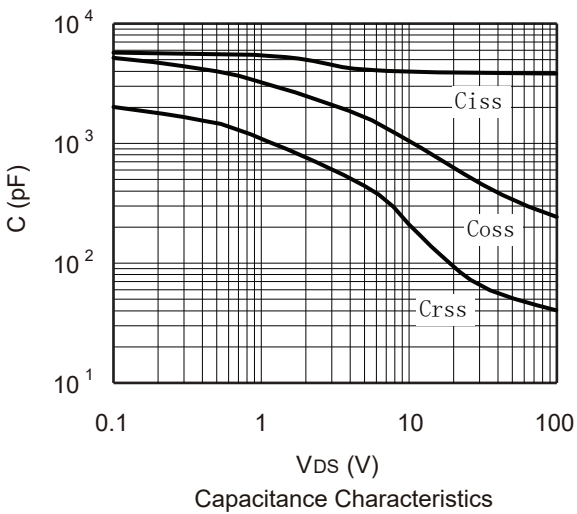
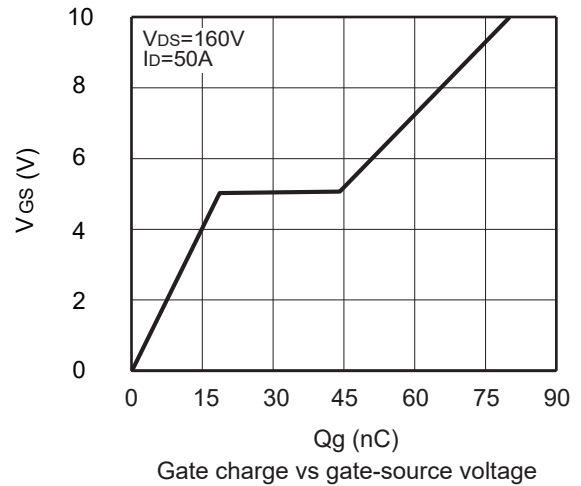
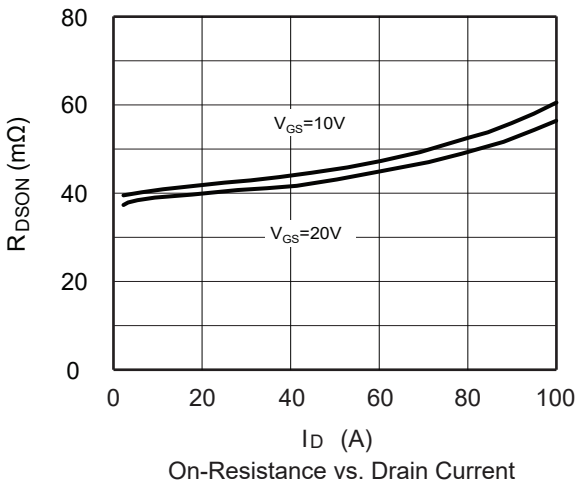
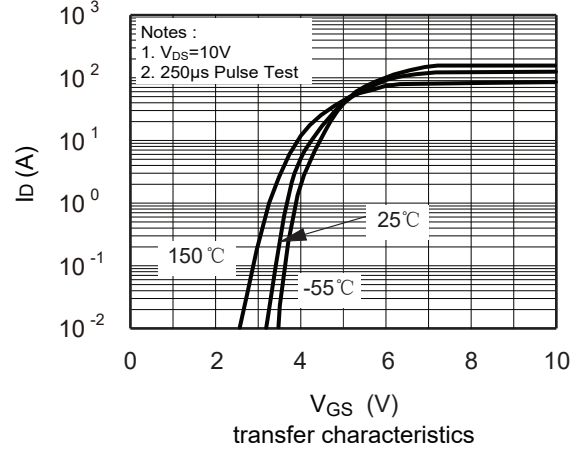
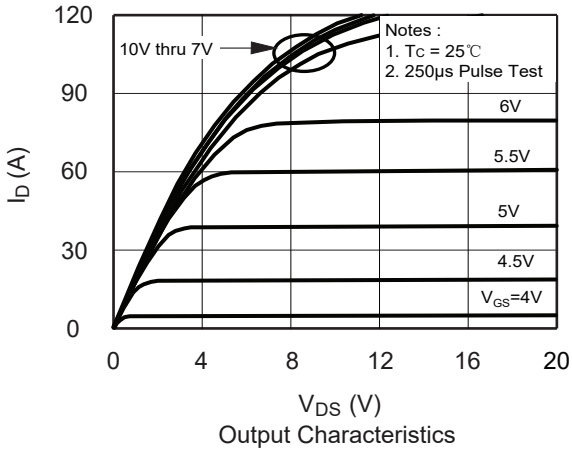
- 1.The EAS data shows Max. rating .The test condition is V_{DS}=100V , V_{GS}=10V , L=10mH , I_{AS}=26A.
2. Pulse test: Pulse width≤300us, Duty cycles≤2%.
3. Essentially independent of operating temperature typical characteristics.

This product has been designed and qualified for the consumer market.

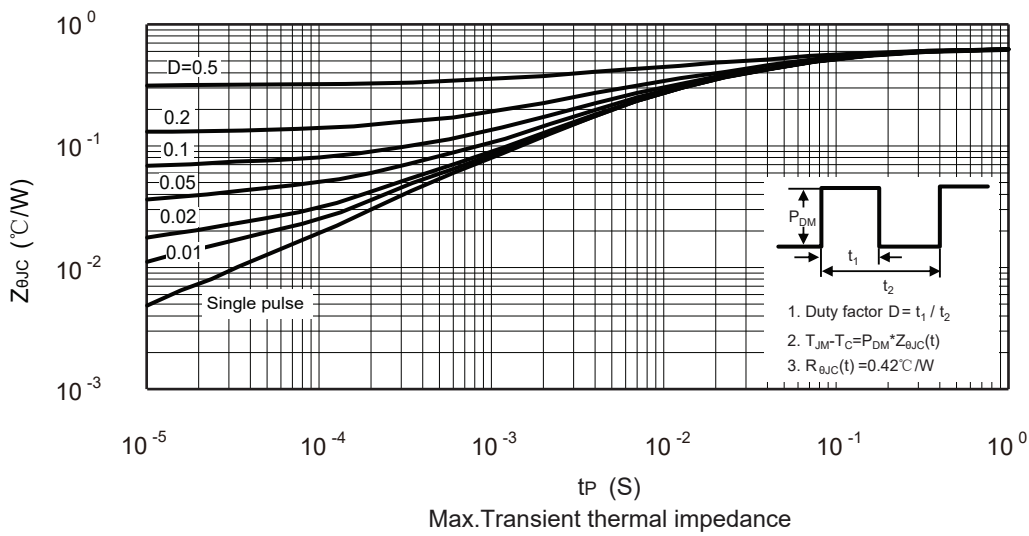
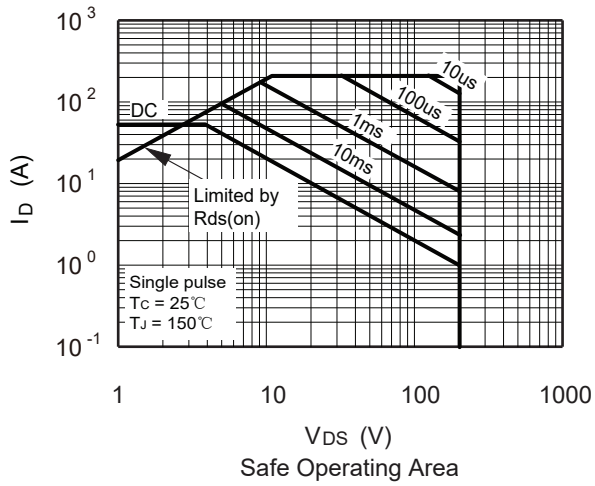
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Cmos reserves the right to improve product design , functions and reliability without notice.Please refer to the latest version of specification.

Typical Characteristics



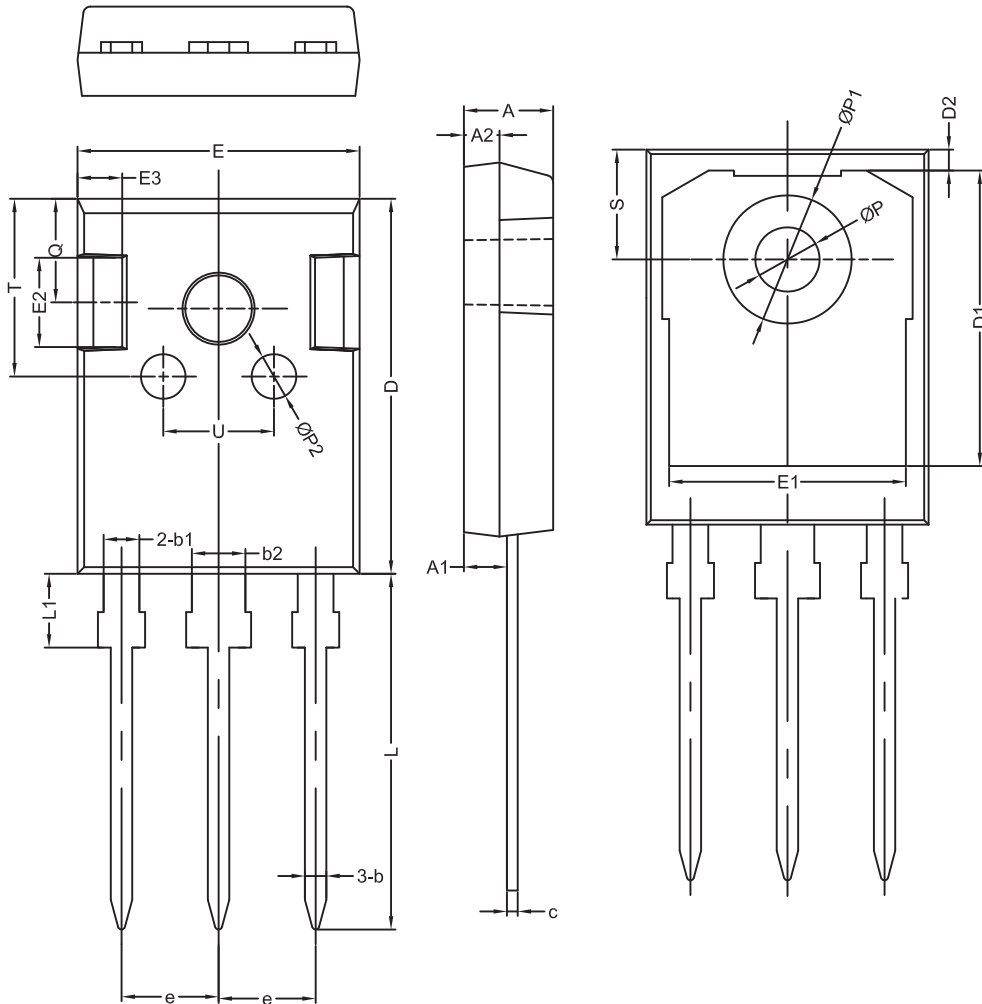
Typical Characteristics



Package Dimension

TO-247

Unit :mm

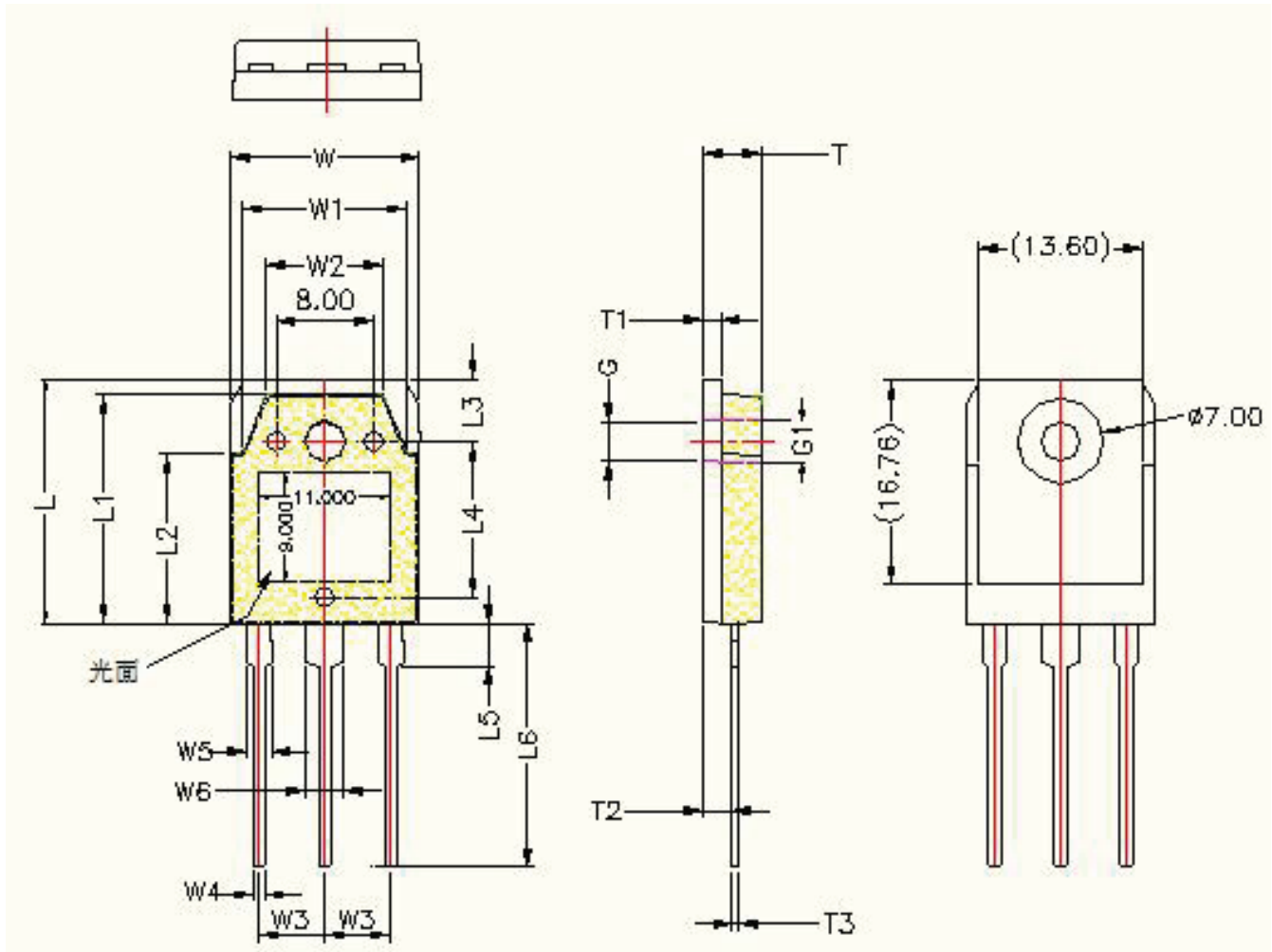


| 符号 | 机械尺寸/mm | | | 符号 | 机械尺寸/mm | | |
|----|---------|-------|-------|----|---------|-------|-------|
| | 最小值 | 典型值 | 最大值 | | 最小值 | 典型值 | 最大值 |
| A | 4.80 | 5.00 | 5.20 | E2 | | 5.00 | |
| A1 | 2.21 | 2.41 | 2.61 | E3 | | 2.50 | |
| A2 | 1.90 | 2.00 | 2.10 | e | | 5.44 | |
| b | 1.10 | 1.20 | 1.35 | L | 19.42 | 19.92 | 20.42 |
| b1 | | 2.00 | | L1 | | 4.13 | |
| b2 | | 3.00 | | P | 3.50 | 3.60 | 3.70 |
| c | 0.55 | 0.60 | 0.75 | P1 | | 7.19 | |
| D | 20.80 | 21.00 | 21.20 | P2 | | 2.50 | |
| D1 | | 16.55 | | Q | | 5.80 | |
| D2 | | 1.20 | | S | 6.05 | 6.15 | 6.25 |
| E | 15.60 | 15.80 | 16.0 | T | | 10.00 | |
| E1 | | 13.30 | | U | | 6.20 | |

Package Dimension

TO-3P

Unit :mm



| Symbol | Dimensions | Symbol | Dimensions | Symbol | Dimensions |
|--------|------------|--------|------------|--------|------------|
| W | 15.60±0.3 | L | 19.90±0.3 | T | 4.80±0.3 |
| W1 | 13.60±0.3 | L1 | 18.70±0.3 | T1 | 1.50±0.3 |
| W2 | 9.60±0.3 | L2 | 13.90±0.3 | T2 | 2.40±0.3 |
| W3 | 5.45(TYP) | L3 | 5.00±0.3 | T3 | 0.60±0.3 |
| W4 | 1.00±0.3 | L4 | 12.76±0.3 | G | Ø3.25±0.3 |
| W5 | 2.10±0.2 | L5 | 3.50±0.3 | G1 | Ø3.58±0.3 |
| W6 | 3.10±0.2 | L6 | 20.00±0.3 | | |