



NTOLL 7*8 Plastic-Encapsulate MOSFETS

CCMH200N04S N-Channel Power MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| 40 V | 0.85mΩ@10V | 200A |

DESCRIPTION

The CCMH200N04S uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications .

FEATURES

- Split Gate Trench Technology
- Low RDS(ON)
- Low Gate Charge
- Low Gate Resistance
- AEC Q101 qualified

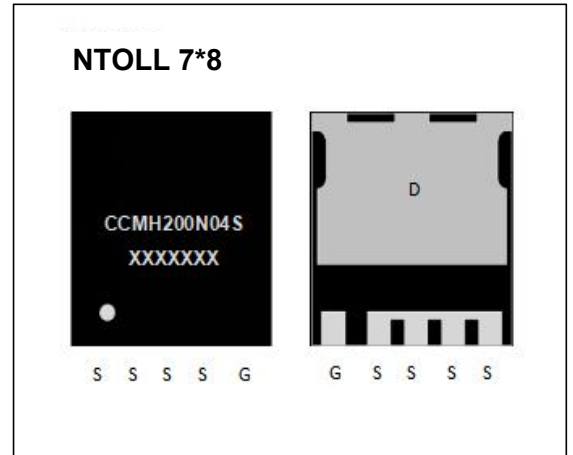
APPLICATIONS

- Motors,lamps and solenoid control
- Transmission control
- Power switching application

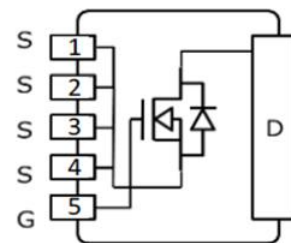
MARKING



CCMH200N04S =Part No.
XXXXXXX = Code.



EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS(T_c=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|-----------------------------------|-----------|------|
| Drain-Source Voltage | V _{DS} | 40 | V |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Continuous Drain Current ¹ | I _D | 200 | A |
| Pulsed Drain Current ² | I _{DM} | 800 | A |
| Single Pulse Avalanche Energy ²³ | E _{AS} | 1600 | mJ |
| Total Power Dissipation ¹ | P _D | 250 | W |
| Thermal Resistance from Junction to Case ¹² | R _{θJC} | 0.6 | °C/W |
| Thermal Resistance from Junction to ambient ²⁴ | R _{θJA} | 48 | °C/W |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | -55~ +175 | °C |
| Soldering Temperature , for 10S(1.6mm from case) | - | 260 | °C |

Notes:

1. Current is limited by package; with an R_{thjc} = 0.6 °C/W the chip is able to carry 370 A at 25°C.
2. The parameter is not subject to production test-verified by design/characterization.
3. EAS condition: V_{DD}=20V, V_{GS}=10V, I_D=80A, L=0.5mH, R_g=25Ω Starting T_J =25°C.
4. 6cm² cooling area. Device on 40mmX40mmX1.5mm epoxy PCB FR4 with 6cm² (one layer, 70um thick) copper area for drain connecting.
PCB is Vertical in still air.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

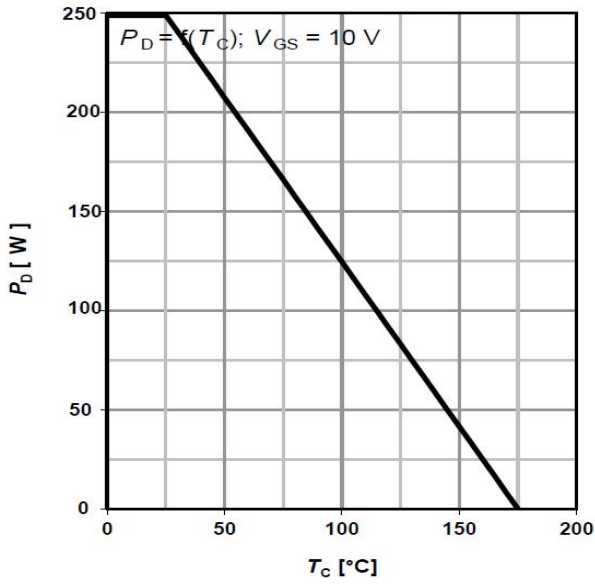
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--|---------------|--|-----|------|-----------|------------|
| Off characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 40 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 40V, V_{GS} = 0V$ | | | 1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ± 100 | nA |
| On characteristics | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 2.0 | 2.5 | 4.0 | V |
| Static drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 100A$ | | 0.85 | 1.0 | m Ω |
| Forward transconductance | g_{fs} | $V_{DS} = 10V, I_D = 100A$ | | 68 | | S |
| Dynamic characteristics² | | | | | | |
| Input capacitance | C_{iss} | $V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$ | | 6714 | 8050 | pF |
| Output capacitance | C_{oss} | | | 1377 | 1651 | |
| Reverse transfer capacitance | C_{rss} | | | 42 | 62 | |
| Gate resistance | R_g | $V_{DS} = 0V, V_{GS} = 0V,$ $f = 1MHz$ | | 1.0 | | Ω |
| Switching characteristics² | | | | | | |
| Total gate charge | Q_g | $V_{GS} = 0-10V, V_{DD} = 32V,$ $I_D = 200A$ | | 44 | 58 | nC |
| Gate-source charge | Q_{gs} | | | 20 | 27 | |
| Gate-drain charge | Q_{gd} | | | 12 | 18 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 20V, I_D = 200A,$ $V_{GS} = 10V, R_G = 3.5\Omega$ | | 28 | | ns |
| Turn-on rise time | t_r | | | 26 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 46 | | |
| Turn-off fall time | t_f | | | 32 | | |
| Drain-Source Diode Characteristics² | | | | | | |
| Drain-source diode forward voltage | V_{SD} | $V_{GS} = 0V, I_S = 100A$ | | 0.85 | 1.2 | V |
| Continuous drain-source diode forward Current ¹ | I_S | - | | | 200 | A |
| Pulsed drain-source diode forward current | I_{SM} | - | | | 800 | A |
| Reverse recovery time | T_{rr} | $V_R = 20V, I_F = 50A,$ $di/dt = 100A/\mu s$ | | 50 | | ns |
| Reverse recovery charge | Q_{rr} | | | | 52 | |

Note :

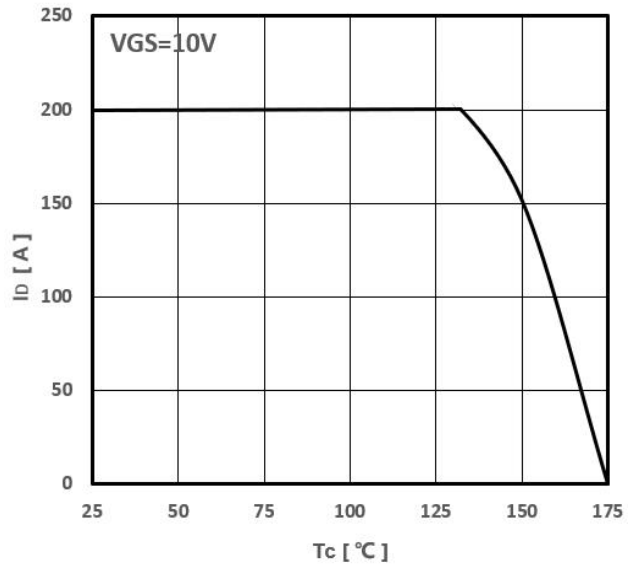
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- 2.The parameter is not subject to production test-verified by design/characterization.

Typical Characteristics

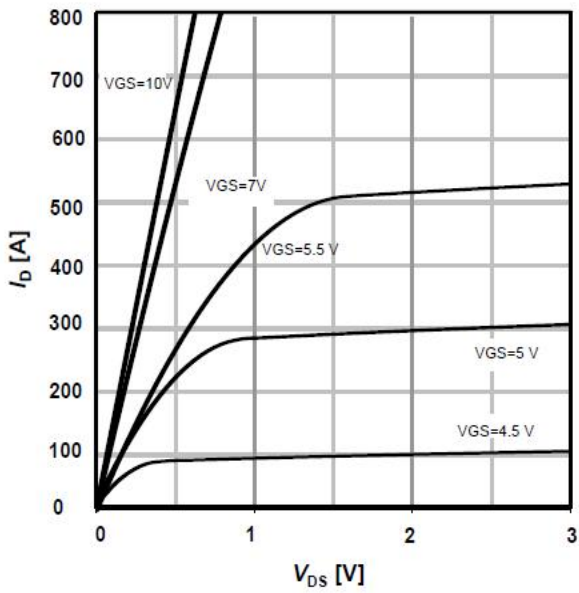
PD -- Tc



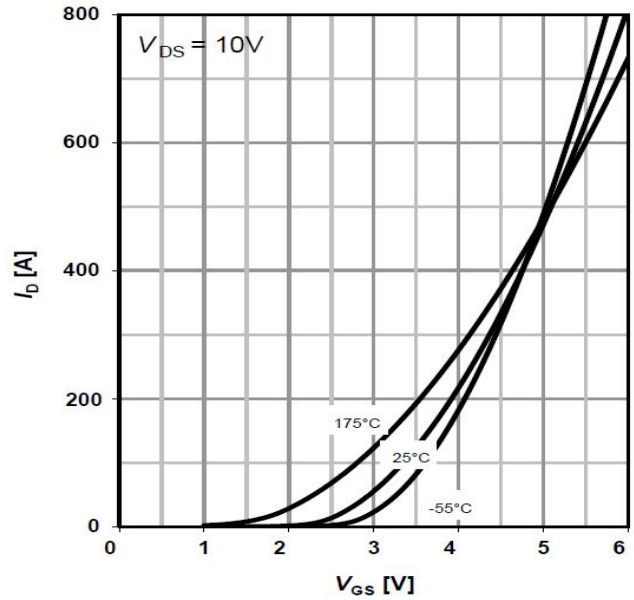
ID -- Tc



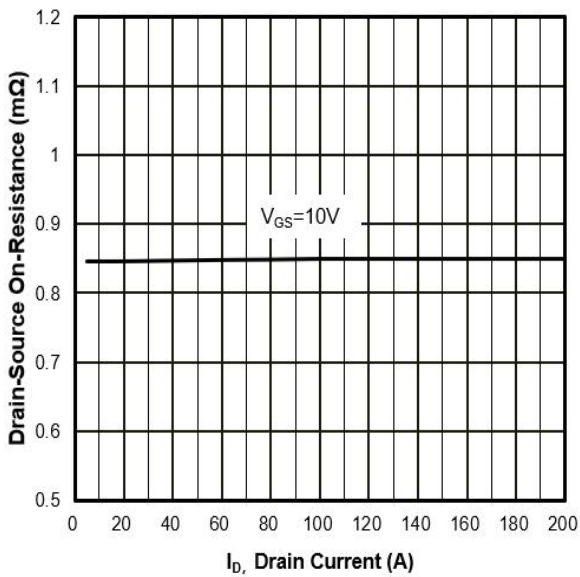
ID -- VDS



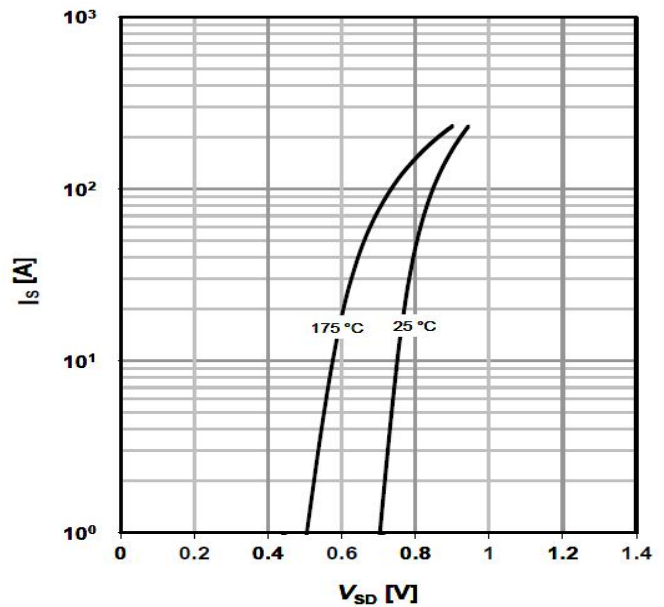
ID -- VGS



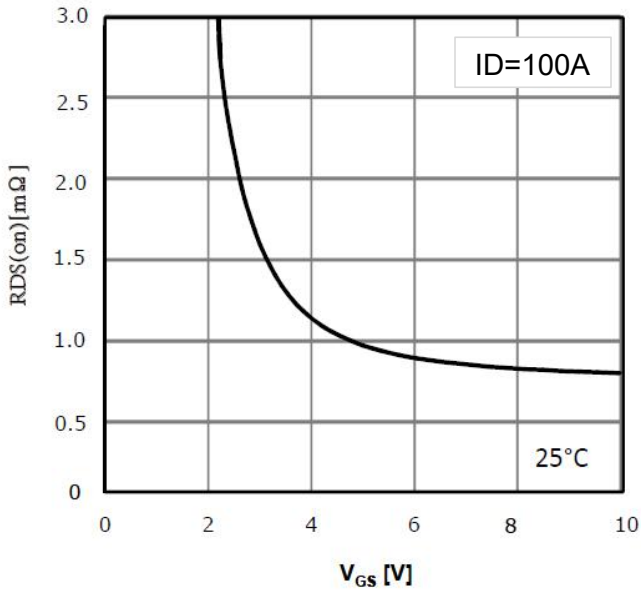
RDS(on) -- ID



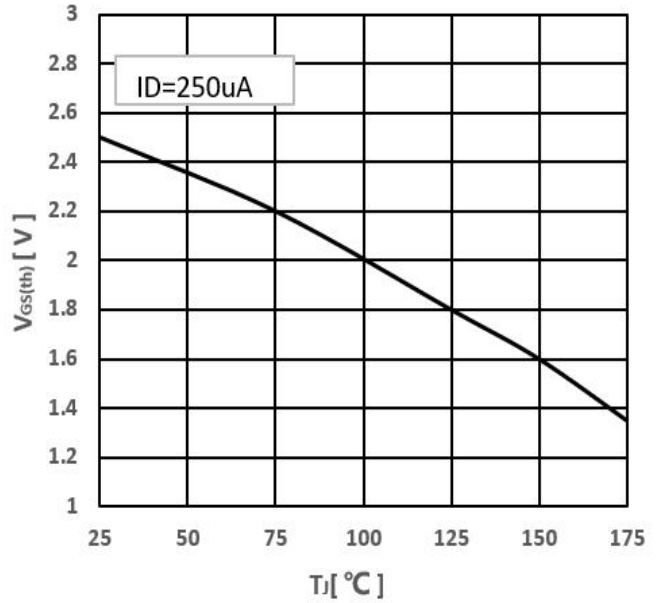
IS -- VSD



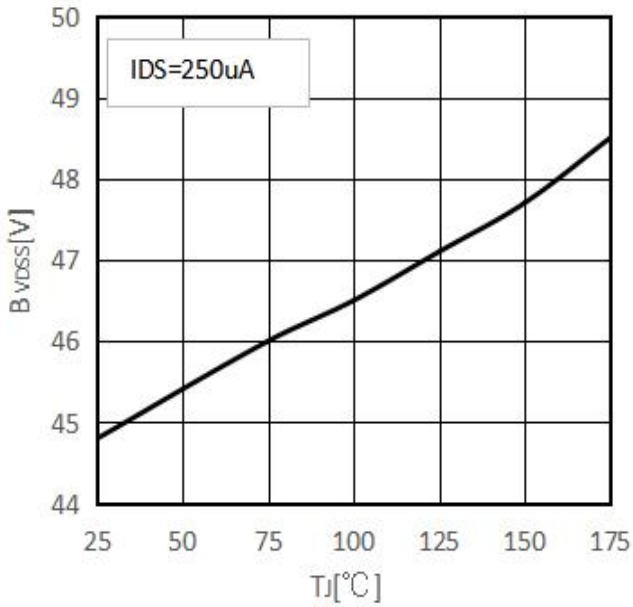
RDS(on) -- VGS



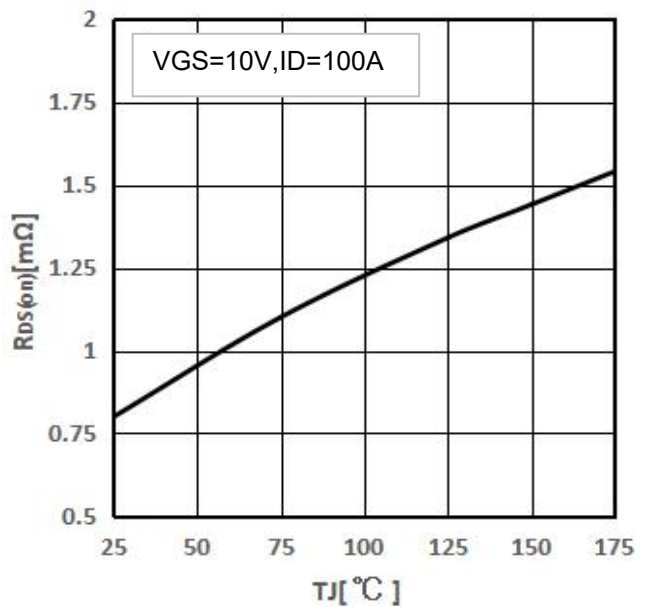
Threshold Voltage



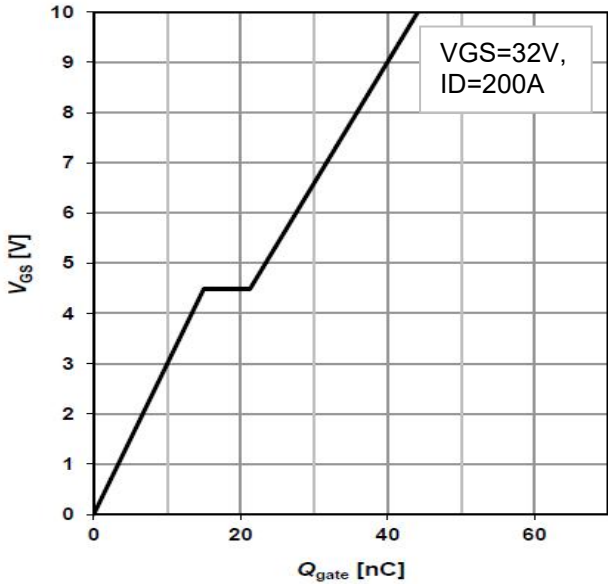
Drain-source breakdown voltage



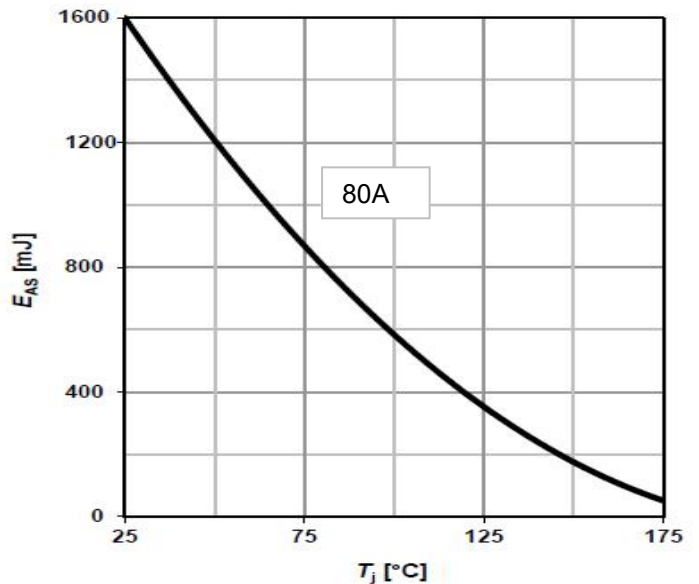
RDS (on) -- TJ



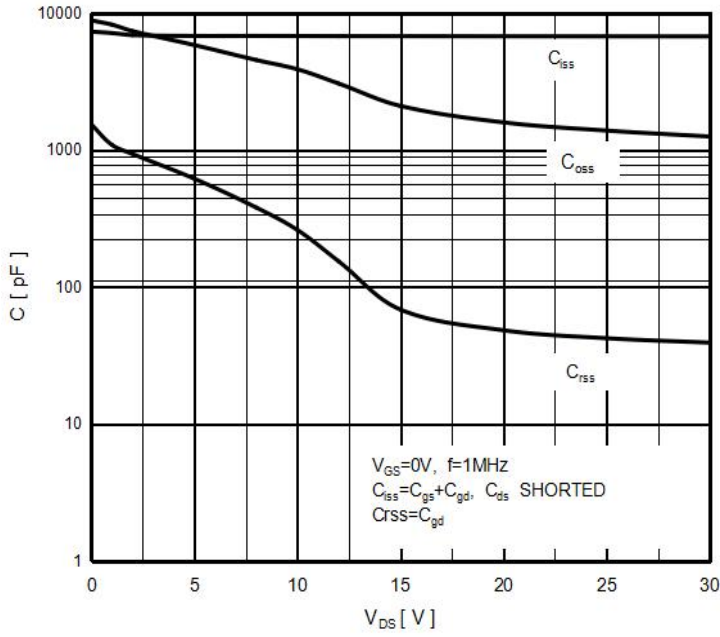
Typ.gate charge



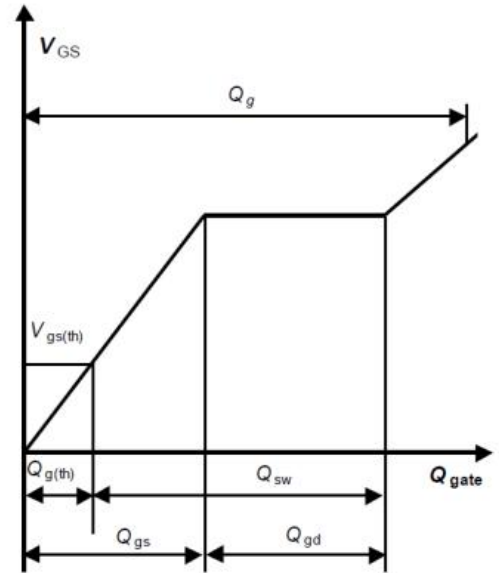
Avalanche energy



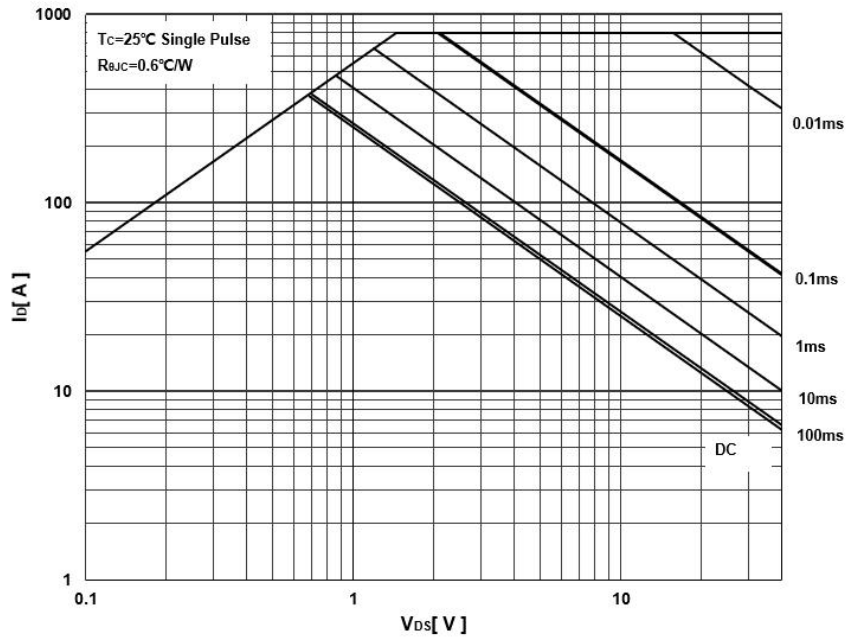
Typ. capacitance



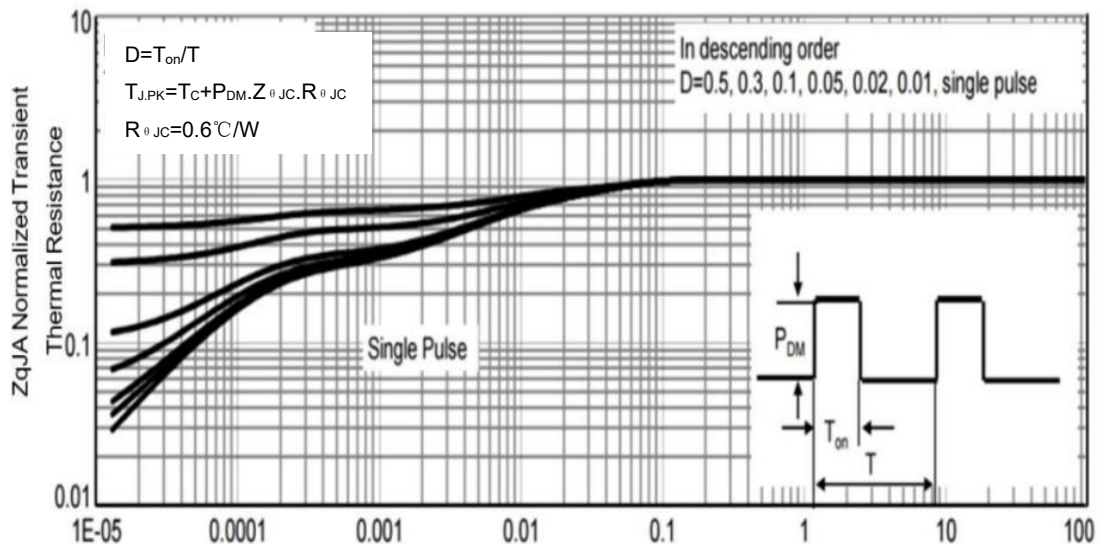
Gate charge waveforms



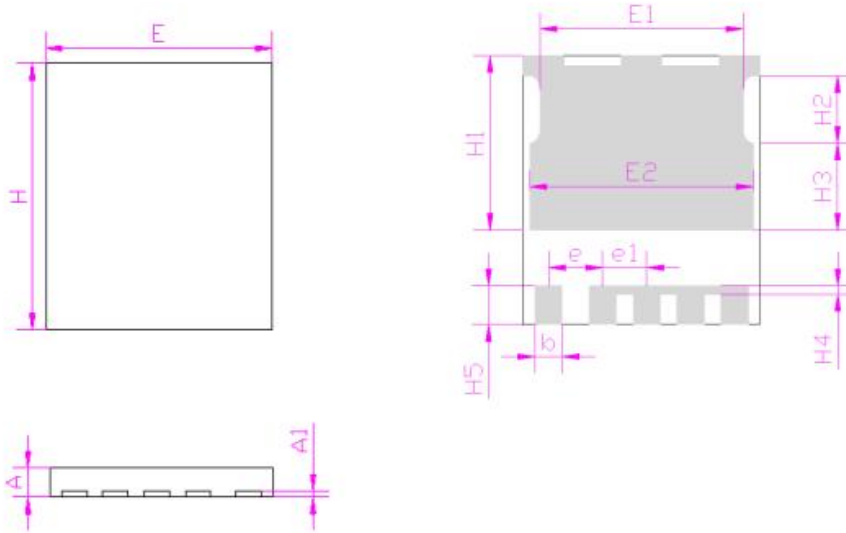
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

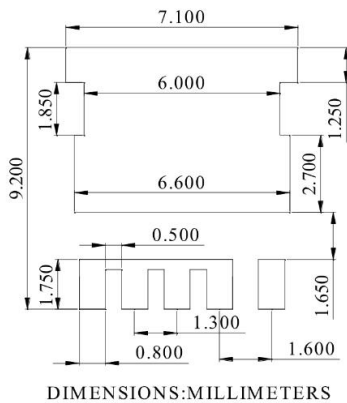


NTOLL 7*8 Package Outline Dimensions



| DIMENSION | COMMON | | |
|-----------|-----------------------|------------|-------|
| | DIMENSIONS MILLIMETER | | |
| | MIN. | NOM. | MAX. |
| A | 0.800 | 0.900 | 1.000 |
| A1 | 0.150 | 0.203<REF> | 0.300 |
| b | 0.700 | 0.800 | 0.900 |
| E | 6.80 | 7.00 | 7.20 |
| E1 | 6.00<REF> | | |
| E2 | 6.40<REF> | | |
| e | 1.60<BSC> | | |
| e1 | 1.30<BSC> | | |
| H | 7.80 | 8.00 | 8.20 |
| H1 | 5.20<REF> | | |
| H2 | 2.00<REF> | | |
| H3 | 2.60<REF> | | |
| H4 | 0.40<REF> | | |
| H5 | 1.15<REF> | | |

NTOLL 7*8 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance:0.5mm.
3. The pad layout is for reference purposes only.

NOTICE

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| Date of change | Rev # | revise content |
|----------------|-------|--------------------------|
| 2022/12/12 | A/0 | / |
| 2023/05/16 | A/1 | 产品升级 |
| 2023/11/10 | A/2 | 微调产品实测参数（提高测试电流），增加结电容上限 |
| | | |
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