

Description

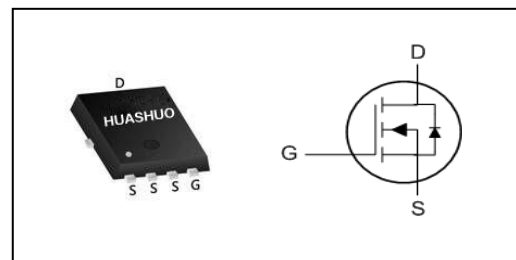
The HSBB8008 is the high cell density trenched N-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The HSBB8008 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Product Summary

| | | |
|-------------------------|-----|----|
| V _{DS} | 30 | V |
| R _{DS(ON),typ} | 4.2 | mΩ |
| I _D | 50 | A |

PRPAK3X3 Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---------------------------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | 30 | V |
| V _{GS} | Gate-Source Voltage | ±12 | V |
| I _D @T _C =25°C | Continuous Drain Current, V _{GS} @ 10V ₁ | 50 | A |
| I _D @T _C =100°C | Continuous Drain Current, V _{GS} @ 10V ₁ | 32 | A |
| I _{DM} | Pulsed Drain Current ₂ | 150 | A |
| EAS | Single Pulse Avalanche Energy ₃ | 125 | mJ |
| I _{AS} | Avalanche Current | 50 | A |
| P _D @T _C =25°C | Total Power Dissipation ₄ | 31 | 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 ₁ | --- | 65 | °C/W |
| R _{θJC} | Thermal Resistance Junction-Case ₁ | --- | 4 | °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 | 30 | --- | --- | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =12A | --- | 4.2 | 4.9 | mΩ |
| | | V _{GS} =4.5V, I _D =12A | --- | 4.6 | 5.5 | |
| | | V _{GS} =2.5V, I _D =10A | --- | 5.5 | 7.5 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 0.4 | --- | 1.0 | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =24V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =24V, V _{GS} =0V, T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =12A | --- | 25 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 1.4 | --- | Ω |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =20V, V _{GS} =4.5V, I _D =12A | --- | 32 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 6.1 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 14 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =15V, V _{GS} =10V, R _G =1.5Ω I _D =12A | --- | 12 | --- | ns |
| T _r | Rise Time | | --- | 46 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 33 | --- | |
| T _f | Fall Time | | --- | 7.5 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 3100 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 405 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 310 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| I _S | Continuous Source Current ^{1,6} | V _G =V _D =0V, Force Current | --- | --- | 50 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=50A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics

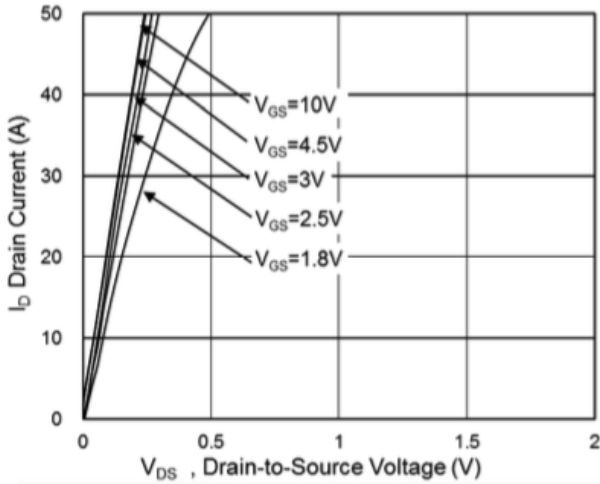


Fig.1 Typical Output Characteristics

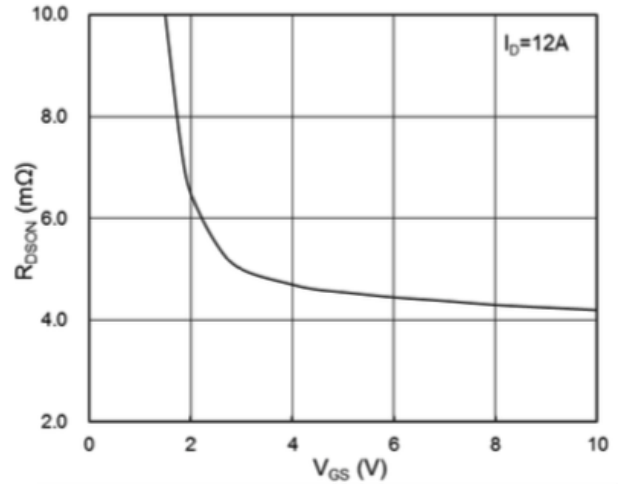


Fig.2 On-Resistance vs. G-S Voltage

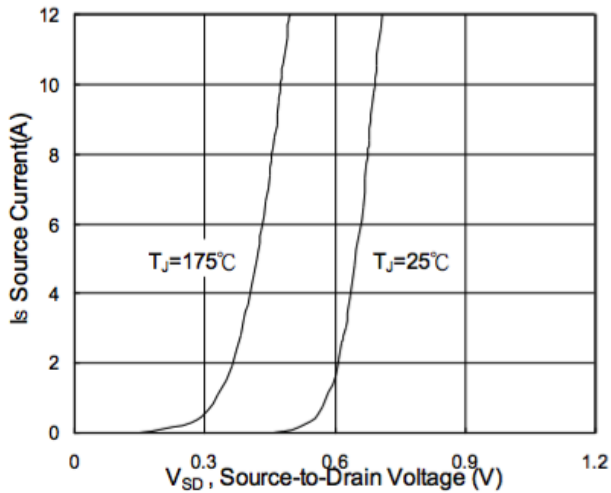


Fig.3 Forward Characteristics of Reverse

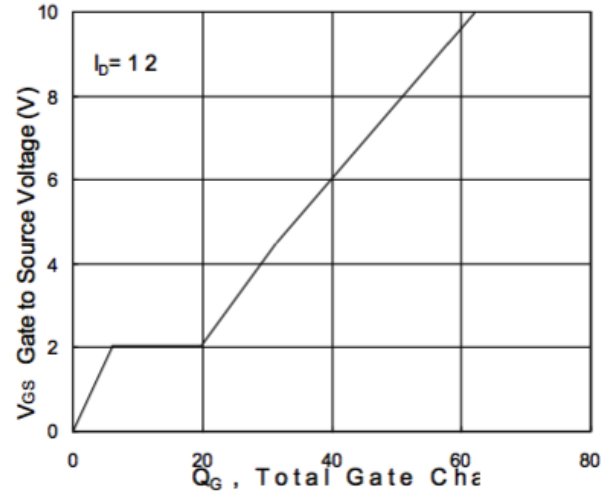


Fig.4 Gate-Charge Characteristics

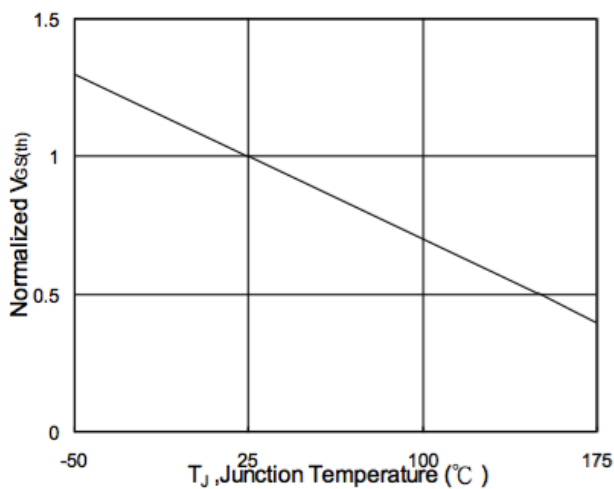


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

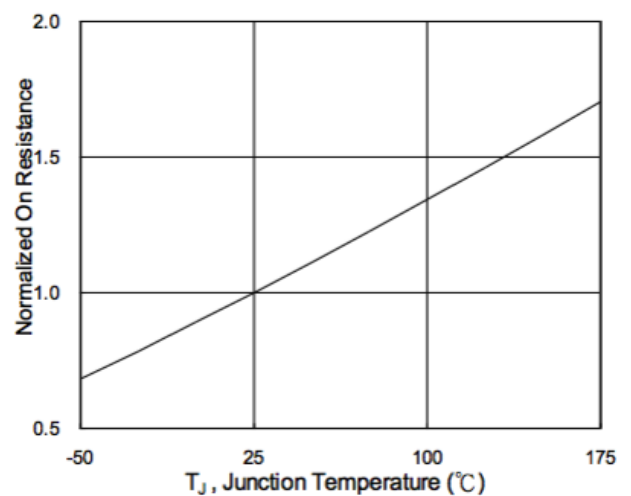


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

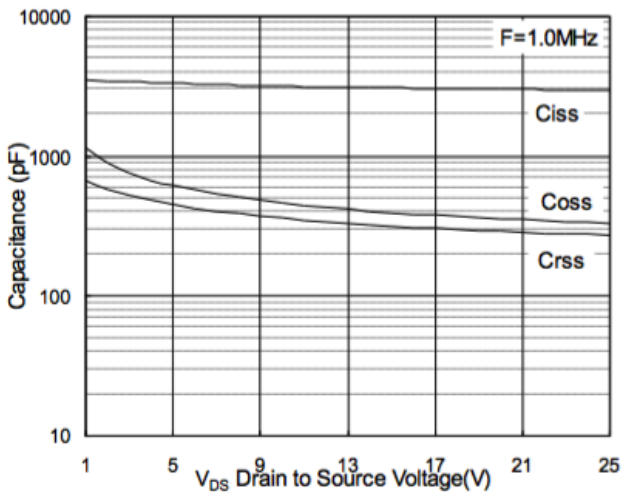


Fig.7 Capacitance

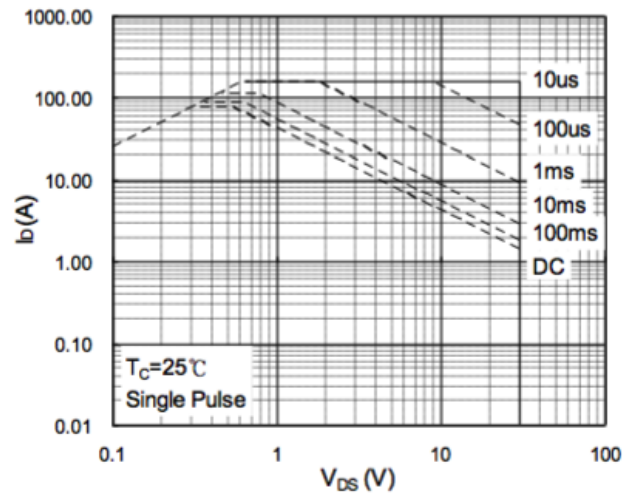


Fig.8 Safe Operating Area

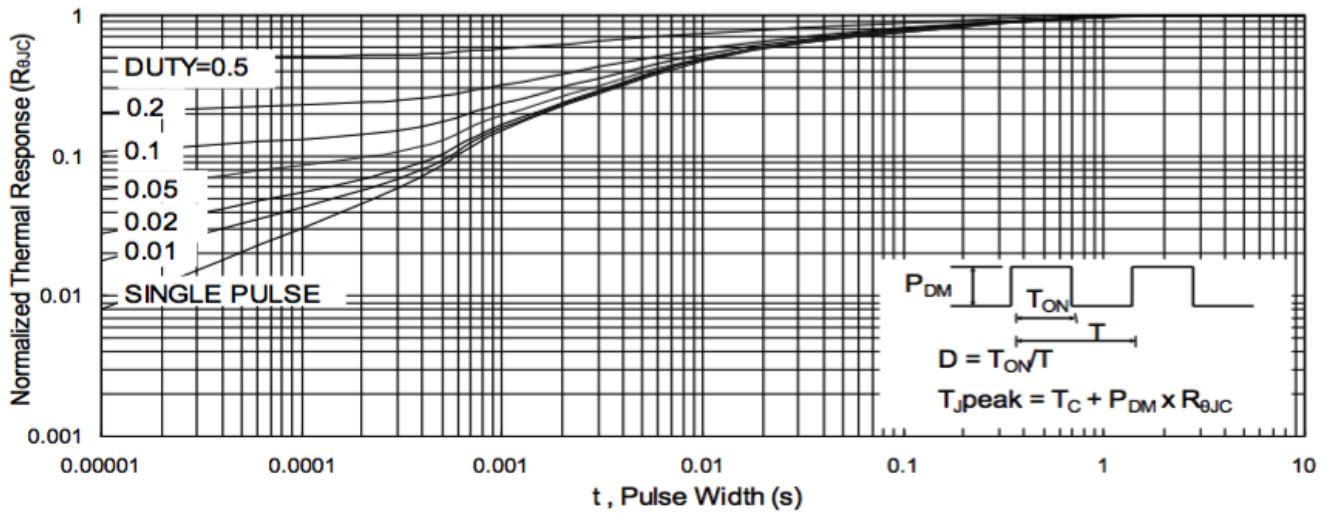


Fig.9 Normalized Maximum Transient Thermal Impedance

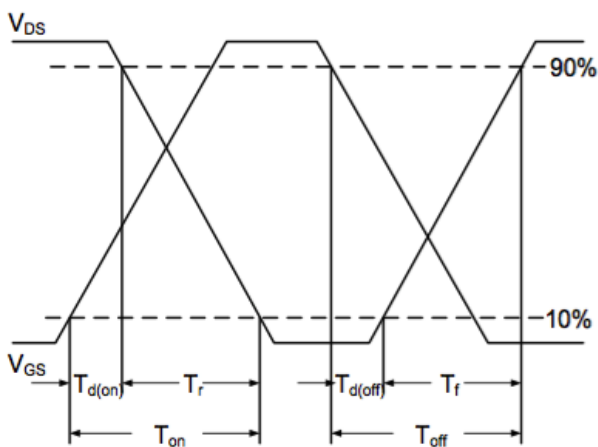


Fig.10 Switching Time Waveform

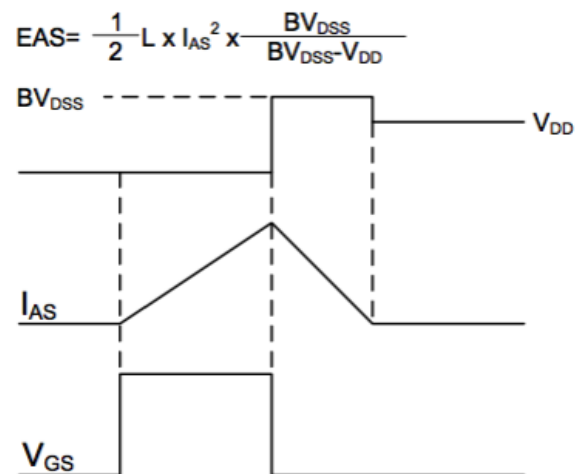
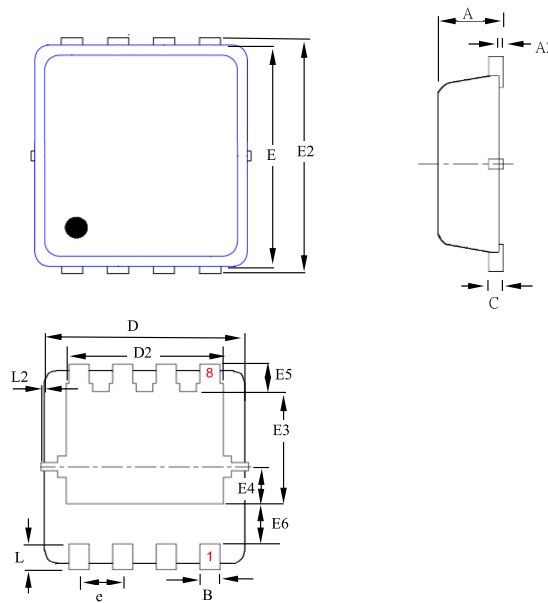


Fig.11 Unclamped Inductive Switching Waveform

Ordering Information

| Part Number | Package code | Packaging |
|-------------|--------------|----------------|
| HSBB8008 | PRPAK3*3 | 3000/Tape&Reel |

PRPAK 3*3(E) Single Outline



| SYMBOLS | MILLIMETERS | | | INCHES | | |
|---------|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.70 | 0.80 | 0.90 | 0.028 | 0.031 | 0.035 |
| A2 | 0.00 | -- | 0.05 | 0.000 | -- | 0.002 |
| B | 0.24 | 0.30 | 0.35 | 0.009 | 0.012 | 0.014 |
| C | 0.10 | 0.15 | 0.25 | 0.004 | 0.006 | 0.010 |
| D | 2.90 | 3.00 | 3.20 | 0.114 | 0.118 | 0.126 |
| D2 | 2.15 | 2.35 | 2.59 | 0.085 | 0.093 | 0.102 |
| E | 2.90 | 3.00 | 3.12 | 0.114 | 0.118 | 0.123 |
| E2 | 3.05 | 3.20 | 3.45 | 0.120 | 0.126 | 0.136 |
| E3 | 1.55 | 1.75 | 1.95 | 0.061 | 0.069 | 0.077 |
| E4 | 0.48 | 0.58 | 0.68 | 0.019 | 0.023 | 0.027 |
| E5 | 0.28 | 0.43 | 0.58 | 0.011 | 0.017 | 0.023 |
| E6 | 0.43 | 0.63 | 0.87 | 0.017 | 0.025 | 0.034 |
| L | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 |
| L2 | 0.00 | -- | 0.10 | 0.000 | -- | 0.004 |
| e | -- | 0.65 | -- | -- | 0.026 | -- |