



Description

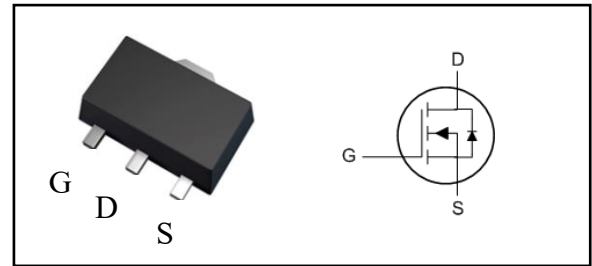
The HSK3400 is the high cell density trenched N-ch MOSFETs, which provides excellent R_{DS(ON)} and efficiency for most of the small power switching and load switch applications.
The HSK3400 meet the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Advanced high cell density Trench technology

Product Summary

| | | |
|-------------------------|----|----|
| V _{DS} | 30 | V |
| R _{DS(ON),max} | 26 | mΩ |
| I _D | 6 | A |

SOT-89 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 _A =25°C | Continuous Drain Current, V _{GS} @ 4.5V ¹ | 6 | A |
| I _D @T _A =70°C | Continuous Drain Current, V _{GS} @ 4.5V ¹ | 5 | A |
| I _{DM} | Pulsed Drain Current ² | 24 | A |
| P _D @T _A =25°C | Total Power Dissipation ³ | 1.7 | 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 | --- | 75 | °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 |
| ΔBV _{DSS} /ΔT _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.029 | --- | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =10V, I _D =5.9A | --- | 21 | 26 | mΩ |
| | | V _{GS} =4.5V, I _D =5A | --- | 25 | 30 | |
| | | V _{GS} =2.5V, I _D =4A | --- | 35 | 45 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 0.5 | 0.9 | 1.5 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -2.82 | --- | mV/°C |
| 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} =±12V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =6A | --- | 33 | --- | S |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =15V, V _{GS} =4.5V, I _D =5.8A | --- | 6 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 1.3 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 1.82 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =15V, V _{GS} =10V, R _G =3.0Ω I _D =5.8A | --- | 3 | --- | ns |
| T _r | Rise Time | | --- | 2.5 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 25 | --- | |
| T _f | Fall Time | | --- | 4 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 634 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 78 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 55 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| I _S | Continuous Source Current ^{1,4} | V _G =V _D =0V, Force Current | --- | --- | 5.2 | A |
| I _{SM} | Pulsed Source Current ^{2,4} | | --- | --- | 20 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _S =1A, T _J =25°C | --- | 0.72 | 1.2 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



Typical Characteristics

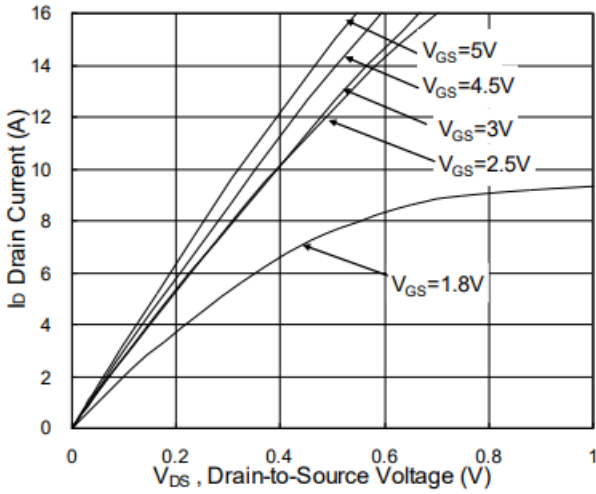


Fig.1 Typical Output Characteristics

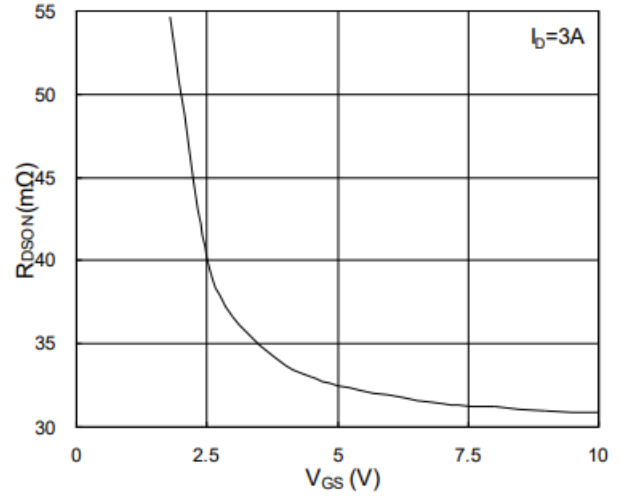


Fig.2 On-Resistance vs. Gate-Source

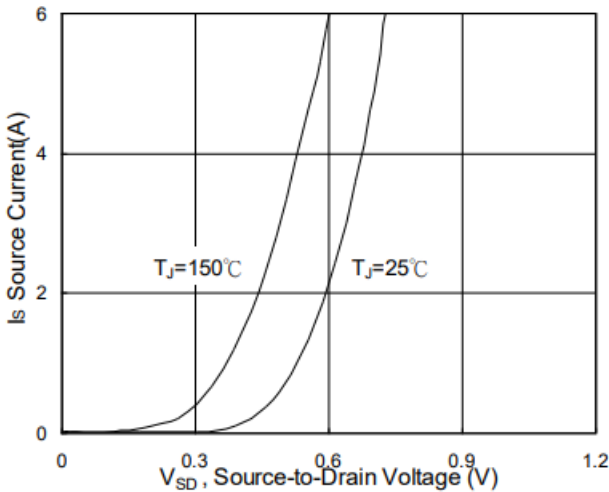


Fig.3 Forward Characteristics Of Reverse

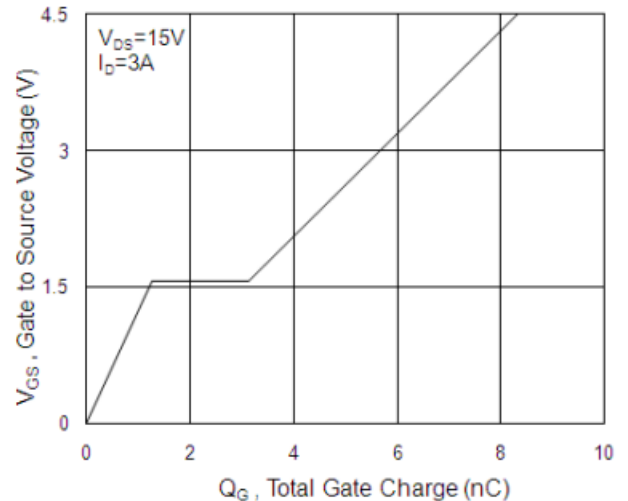


Fig.4 Gate-Charge Characteristics

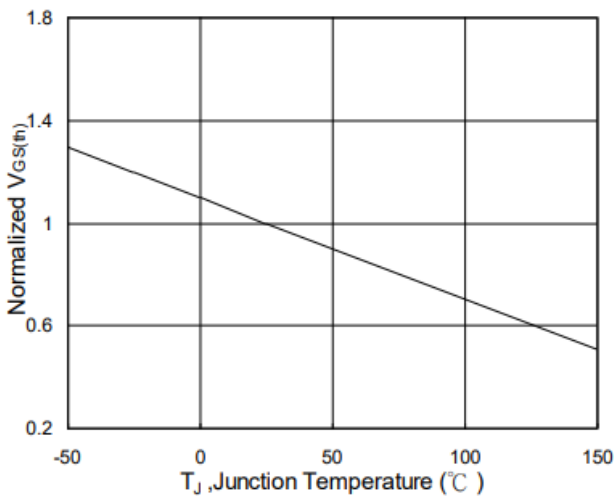


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

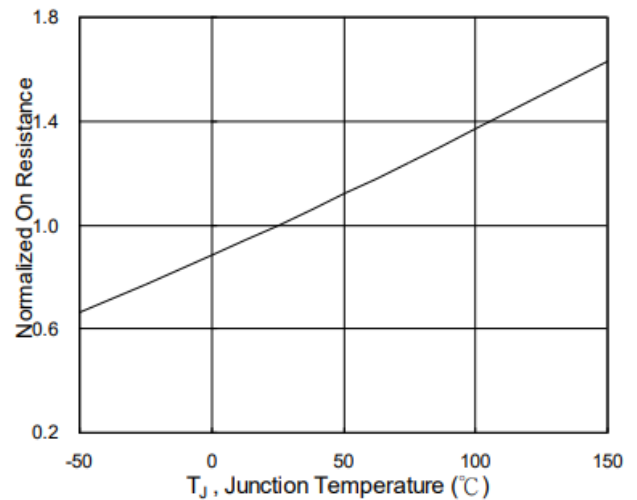


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

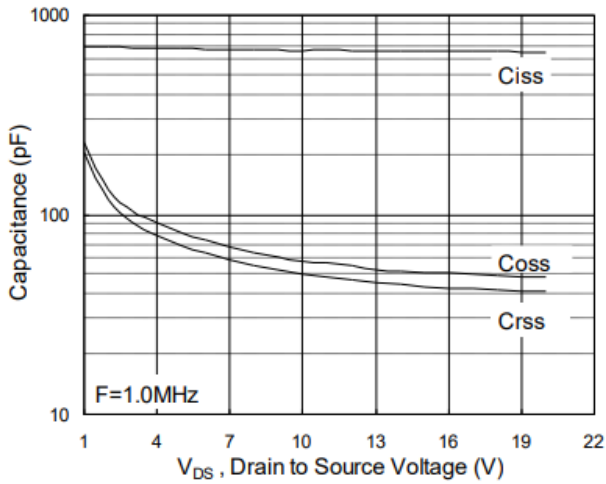


Fig.7 Capacitance

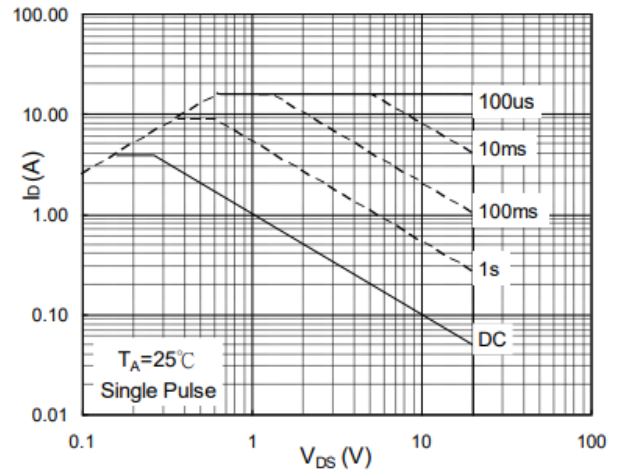


Fig.8 Safe Operating Area

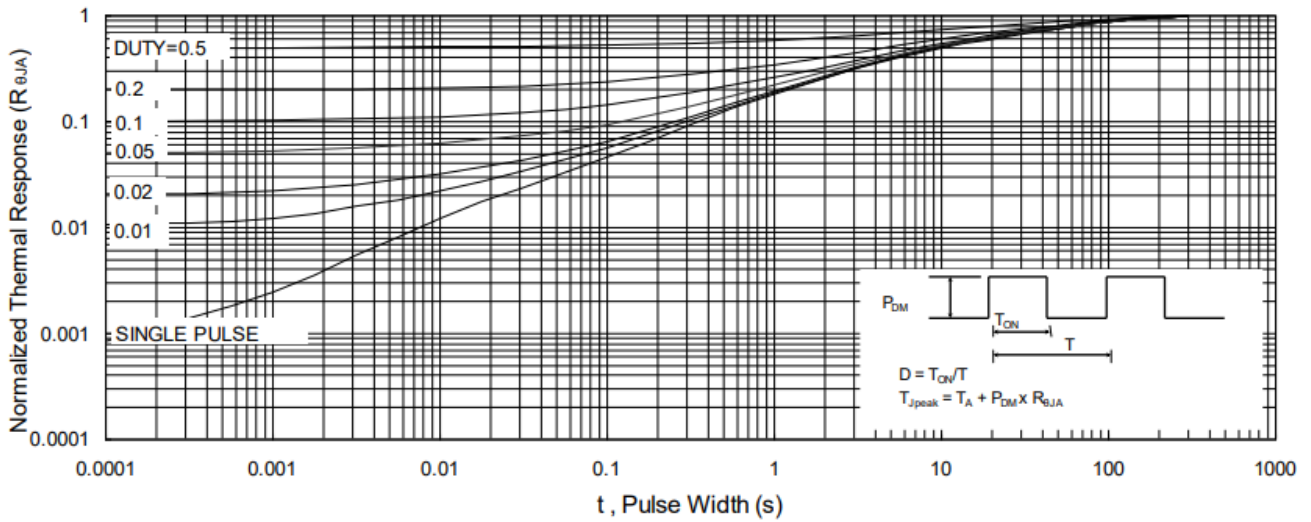


Fig.9 Normalized Maximum Transient Thermal Impedance

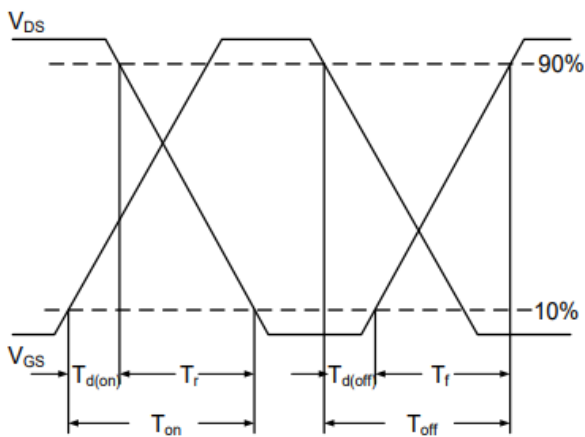


Fig.10 Switching Time Waveform

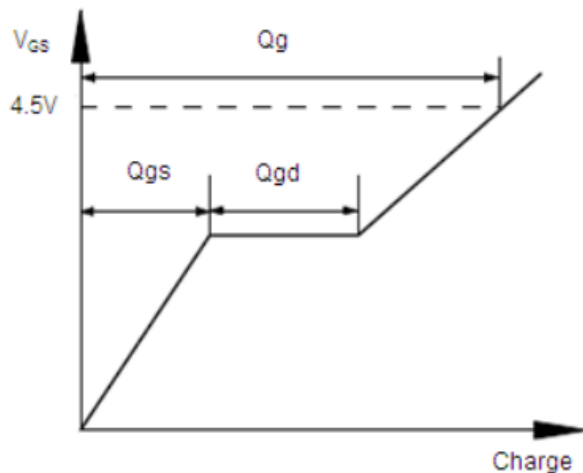
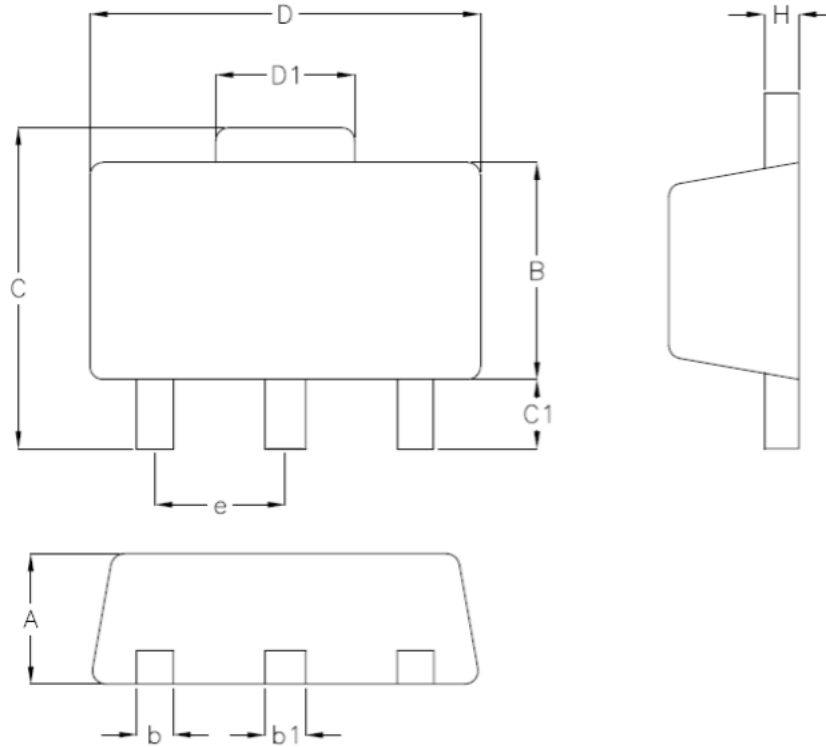


Fig.11 Gate Charge Waveform



Ordering Information

| Part Number | Package code | Packaging |
|-------------|--------------|----------------|
| HSK3400 | SOT-89 | 1000/Tape&Reel |



| SYMBOLS | MILLIMETERS | | INCHES | |
|---------|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.397 | 1.600 | 0.055 | 0.063 |
| b | 0.420 | 0.540 | 0.017 | 0.021 |
| b1 | 0.420 | 0.540 | 0.017 | 0.021 |
| B | 2.388 | 2.591 | 0.094 | 0.102 |
| C | 3.937 | 4.242 | 0.155 | 0.167 |
| C1 | 0.787 | 1.194 | 0.031 | 0.047 |
| D | 4.394 | 4.597 | 0.173 | 0.181 |
| D1 | 1.397 | 1.753 | 0.055 | 0.069 |
| e | 1.448 | 1.549 | 0.057 | 0.061 |
| H | 0.350 | 0.44 | 0.014 | 0.017 |

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