

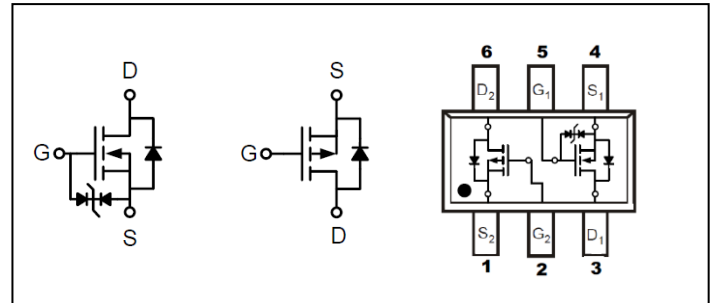
N-Ch and P-Ch Fast Switching MOSFETs
Description

The HSSK8402 uses advanced trench technology to provide excellent RDS(ON), low gate charge and high density cell Design for ultra low on-resistance. This device is suitable for use as a load switch or in PWM applications.

- PWM applications
- Load switch

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|--------|
| 65V | 1.7Ω | 0.13A |
| -55V | 1Ω | -0.13A |

SOT-363 Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | | Units |
|--------------------------------------|--|------------|------------|-------|
| | | N-Channel | P-Channel | |
| V _{DS} | Drain-Source Voltage | 65 | -55 | V |
| V _{GS} | Gate-Source Voltage | ±20 | ±20 | V |
| I _D @T _A =25°C | Continuous Drain Current, V _{GS} @ 10V ¹ | 0.13 | -0.13 | A |
| I _D @T _A =70°C | Continuous Drain Current, V _{GS} @ 10V ¹ | 0.1 | -0.1 | A |
| I _{DM} | Pulsed Drain Current ² | 0.5 | -0.5 | A |
| P _D @T _A =25°C | Total Power Dissipation ⁴ | 0.38 | 0.38 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction-Ambient ¹ | --- | 415 | °C/W |

N-Ch and P-Ch Fast Switching MOSFETs
N-Channel Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|--|--|------|-------|----------|----------------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 65 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=10V, I_D=0.13A$ | --- | 1.7 | 2.3 | Ω |
| | | $V_{GS}=4.5V, I_D=0.13A$ | --- | 2.1 | 2.6 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 1.0 | 1.5 | 2.0 | V |
| $\Delta V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -5.24 | --- | mV/ $^\circ\text{C}$ |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=48V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | μA |
| | | $V_{DS}=48V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 10 | μA |
| g_{fs} | Forward Transconductance | $V_{DS}=30V, I_D=0.13A$ | --- | 160 | --- | mS |
| Q_g | Total Gate Charge (4.5V) | $V_{DS}=30V, V_{GS}=4.5V, I_D=0.13A$ | --- | 0.6 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 0.2 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 0.15 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=30V, V_{GS}=10V, R_G=1\Omega, I_D=0.13A$ | --- | 6.5 | --- | ns |
| T_r | Rise Time | | --- | 12 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 13 | --- | |
| T_f | Fall Time | | --- | 14 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$ | --- | 19 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 7.4 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 4.9 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|------------------------------------|--|------|------|------|------|
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=0.13A, T_J=25^\circ\text{C}$ | --- | --- | 1.2 | 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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ\text{C}$ 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.

P-Channel Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|--|--|------|------|-----------|----------------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -55 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=-10V, I_D=-0.13A$ | --- | 1.0 | 1.8 | Ω |
| | | $V_{GS}=-4.5V, I_D=-0.13A$ | --- | 1.2 | 2.0 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=-250\mu A$ | -1.0 | -1.5 | -2.0 | V |
| $\Delta V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | 4.56 | --- | mV/ $^\circ\text{C}$ |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | -1 | μA |
| | | $V_{DS}=-48V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | -5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| g_{fs} | Forward Transconductance | $V_{DS}=-25V, I_D=-0.13A$ | --- | 60 | --- | S |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=-15V, V_{GEN}=-5V, R_L=50\Omega, I_D=-0.13A$ | --- | 2.1 | --- | ns |
| T_r | Rise Time | | --- | 1.1 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 16 | --- | |
| T_f | Fall Time | | --- | 8 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=-5V, V_{GS}=0V, f=1\text{MHz}$ | --- | 22 | --- | μF |
| C_{oss} | Output Capacitance | | --- | 7.3 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 4 | --- | |

Diode Characteristics

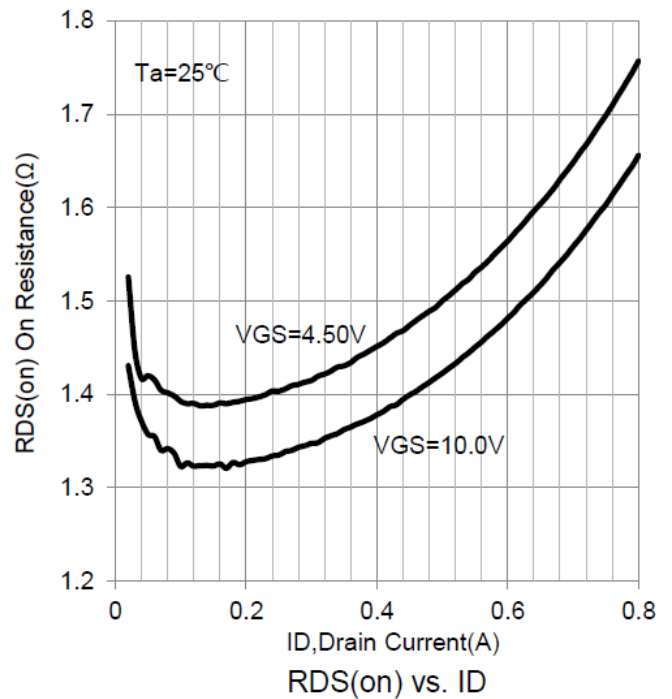
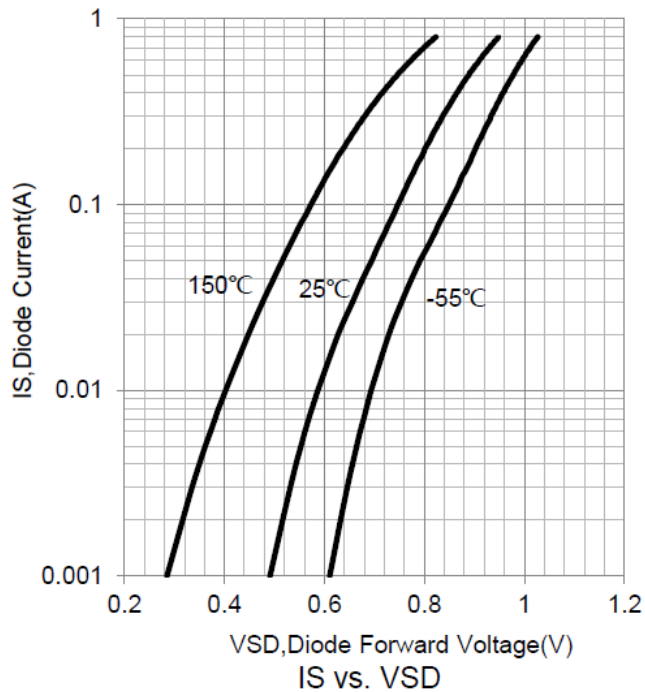
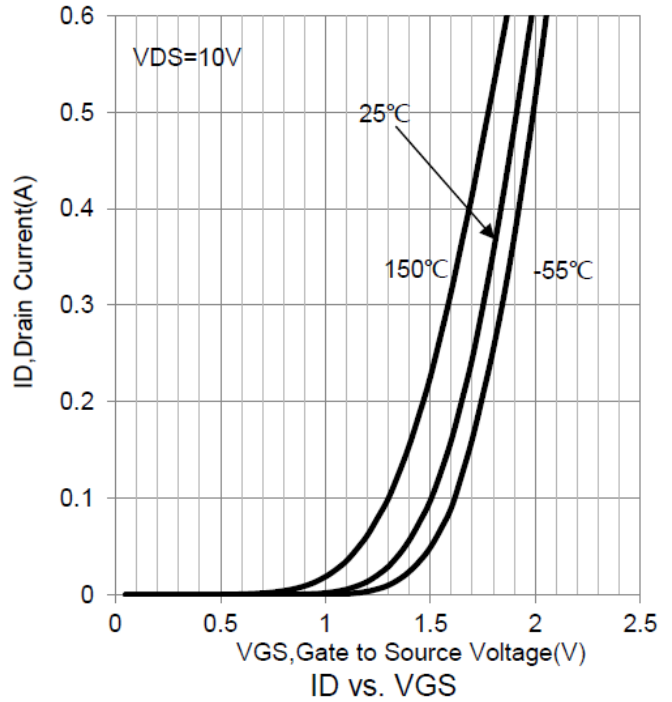
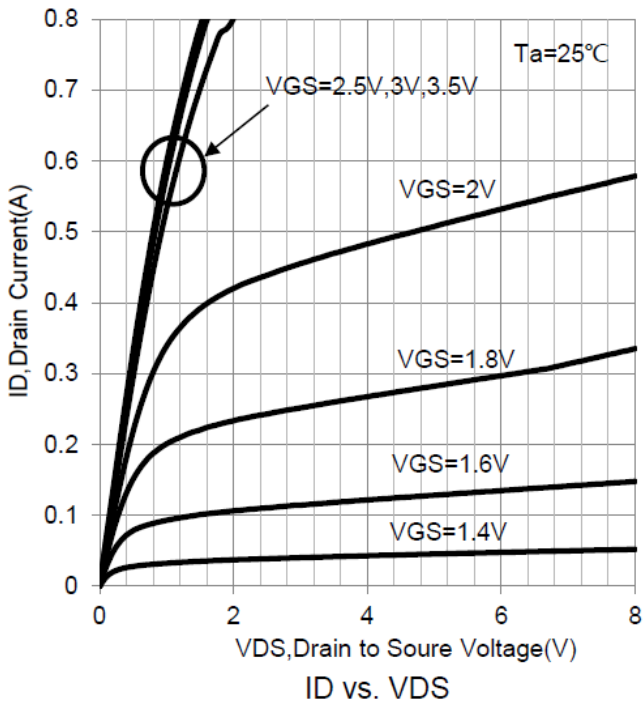
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|------------------------------------|--|------|------|------|------|
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$ | --- | --- | -1.2 | V |

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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ\text{C}$ 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.

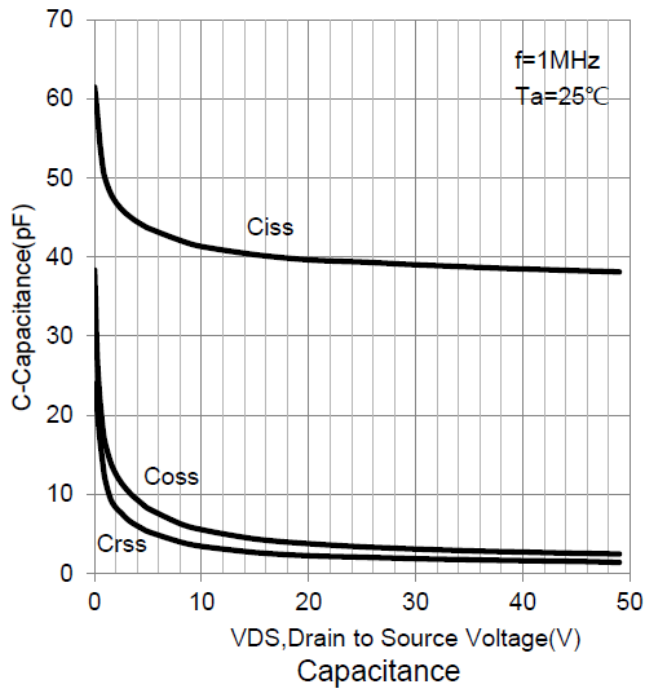
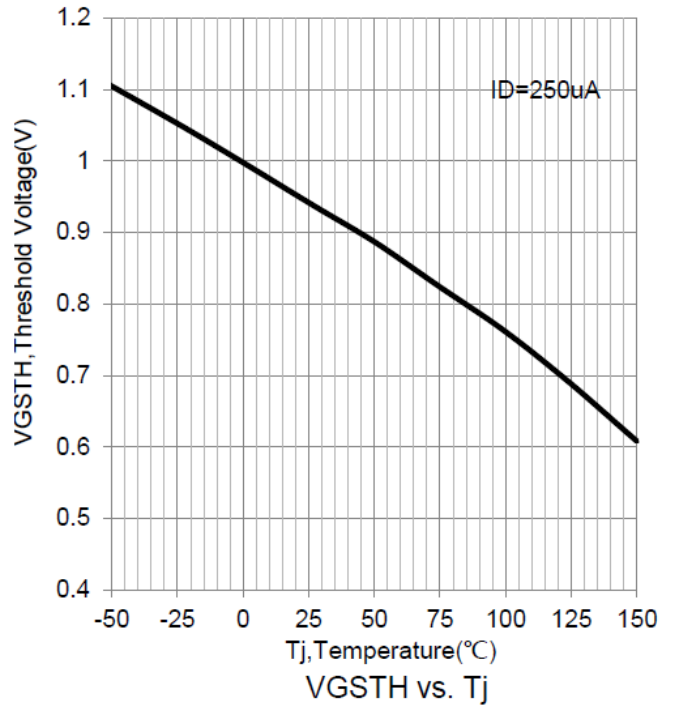
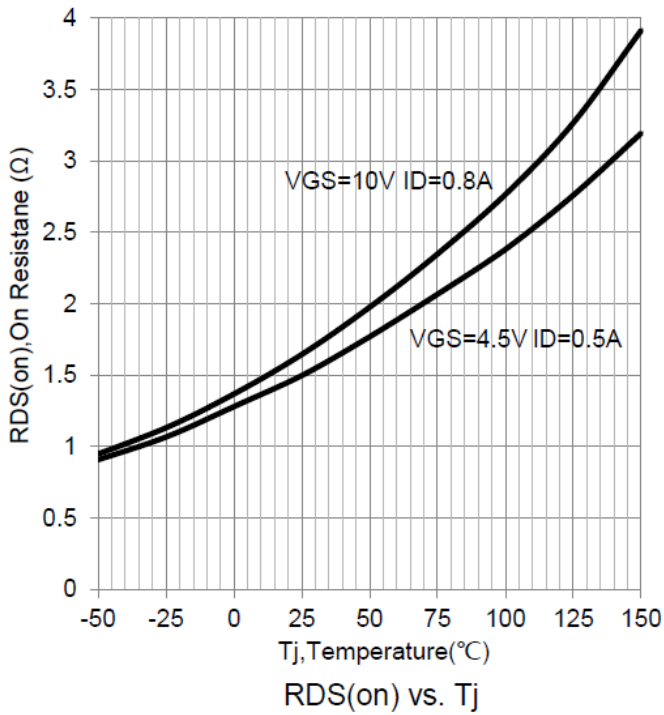


N-Channel Typical Characteristics



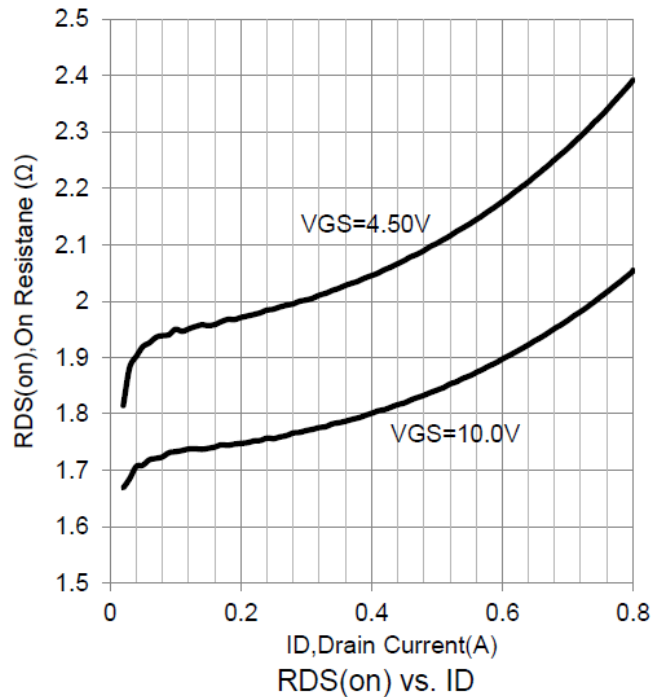
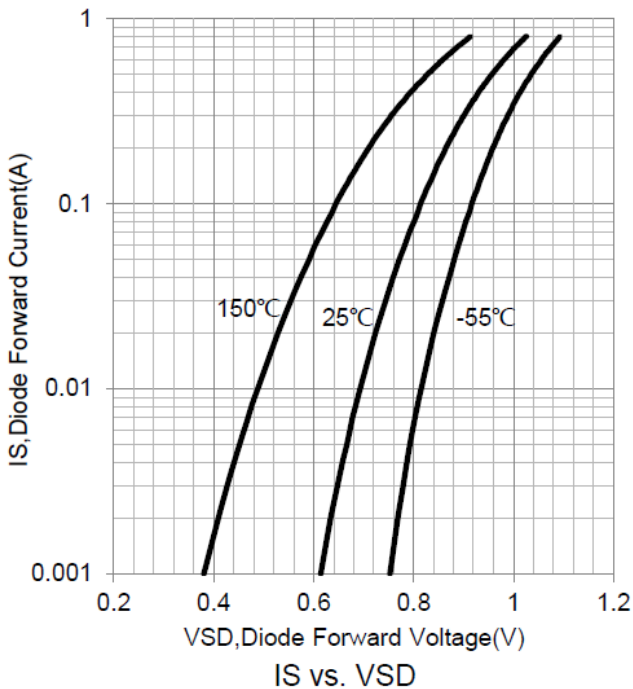
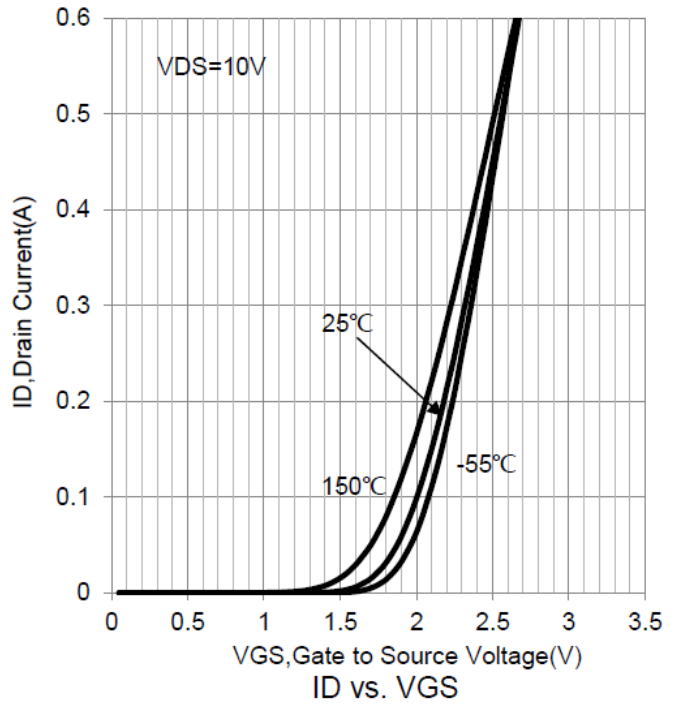
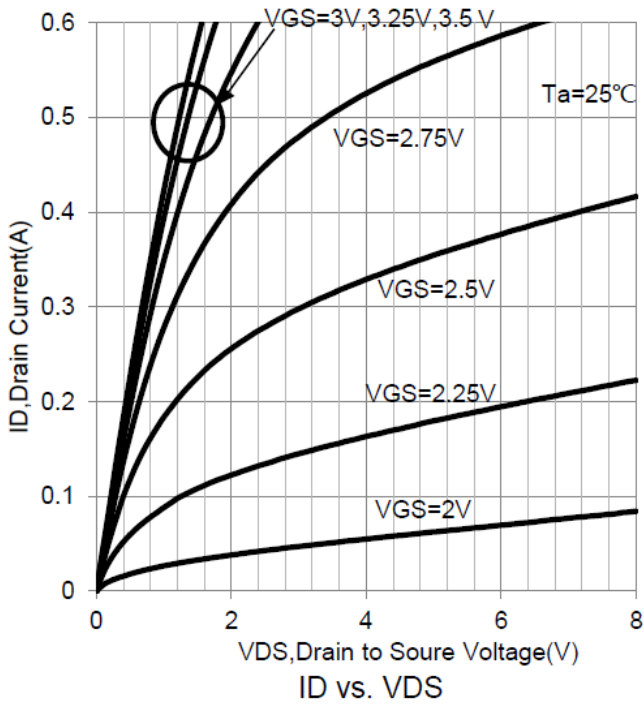


N-Ch and P-Ch Fast Switching MOSFETs



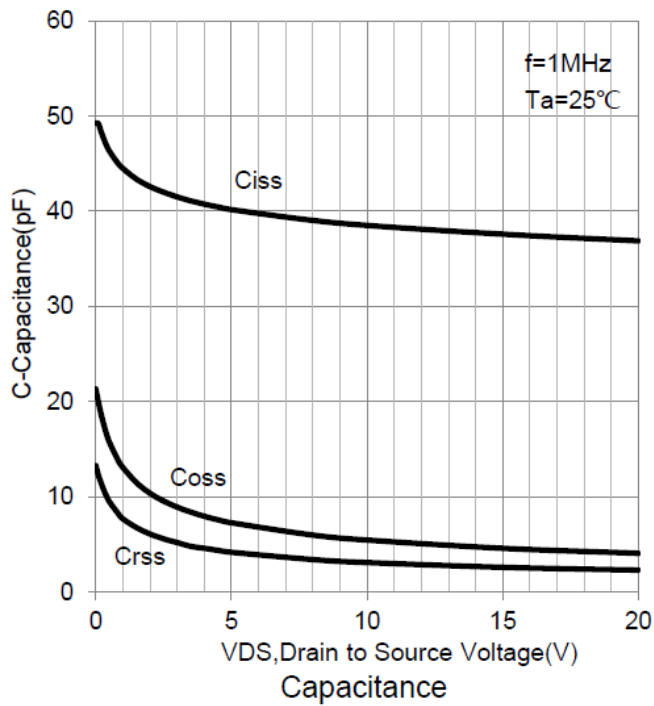
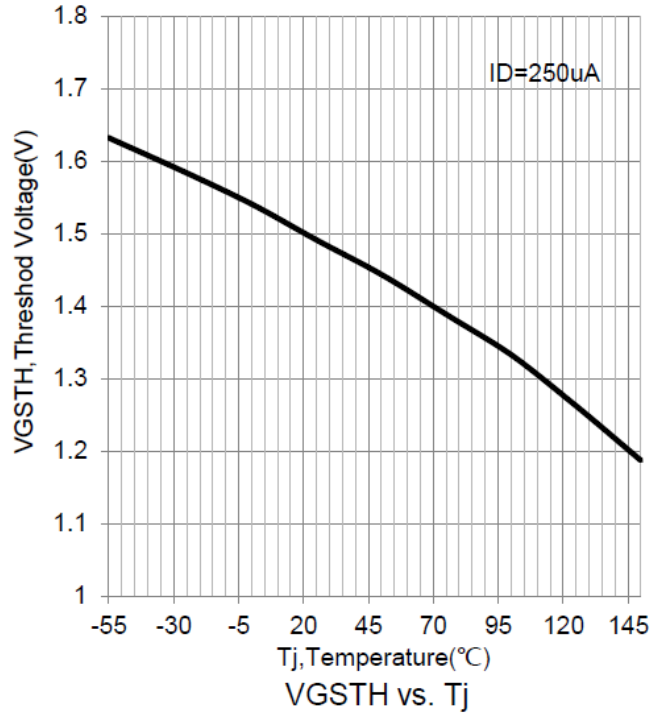
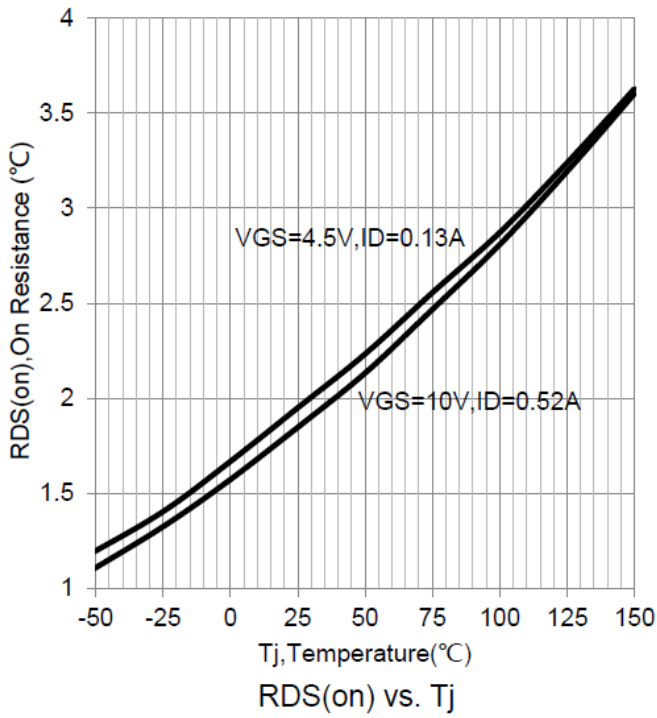


P-Channel Typical Characteristics





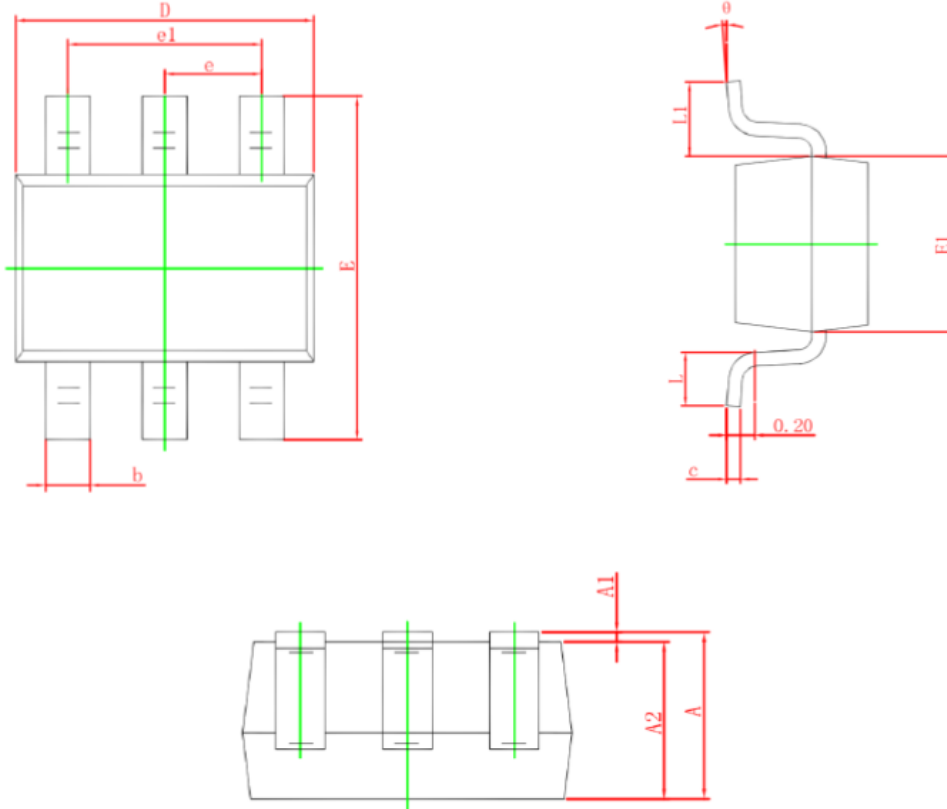
N-Ch and P-Ch Fast Switching MOSFETs





PACKAGE INFORMATION

- SOT-363



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 2.150 | 2.450 | 0.085 | 0.096 |
| E1 | 1.150 | 1.350 | 0.045 | 0.053 |
| e | 0.650 TYP. | | 0.026 TYP. | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.260 | 0.460 | 0.010 | 0.018 |
| L1 | 0.525 REF. | | 0.021 REF. | |
| θ | 0° | 8° | 0° | 8° |

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