

N-Channel 20V(D-S) MOSFET

| Product summary | | |
|---------------------------------------|------|------------|
| V_{DS} | 20 | V |
| $R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ. | 250 | m Ω |
| $R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ. | 300 | m Ω |
| I_D ($T_A=25^\circ C$) | 0.65 | A |

Features

- Operated at Low Logic Level Gate Drive
- Low $R_{DS(on)}$
- ESD protection up to 2 kV

Applications

- Load Switching
- Logic Level Shift

Pin Configuration



Packing Information

| Device | Package | Reel Size | Quantity(Min. Package) |
|----------|---------|-----------|------------------------|
| ECDK1012 | SOT-723 | 7" | 10000pcs |

Absolute Maximum Ratings (at $T_A=25^\circ C$ Unless Otherwise Noted)

| Symbol | Parameter | Rating | Units | |
|----------------|--|------------------|------------|---|
| V_{DS} | Drain-Source Voltage | 20 | V | |
| V_{GS} | Gate-Source Voltage | ± 10 | V | |
| I_D | Continuous Drain Current at $V_{GS}=10V^A$ | $T_A=25^\circ C$ | 0.65 | A |
| | | $T_A=70^\circ C$ | 0.5 | A |
| I_{DM} | Pulse Drain Current Tested B | 3 | A | |
| P_D | Power Dissipation A | $T_A=25^\circ C$ | 0.25 | W |
| T_J, T_{STG} | Junction and Storage Temperature Range | -55 to +150 | $^\circ C$ | |

Thermal Characteristics

| Symbol | Parameter | Typical | Units |
|-----------------|--|---------|--------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to ambient A | 500 | $^\circ C/W$ |

Electrical Characteristics (at $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

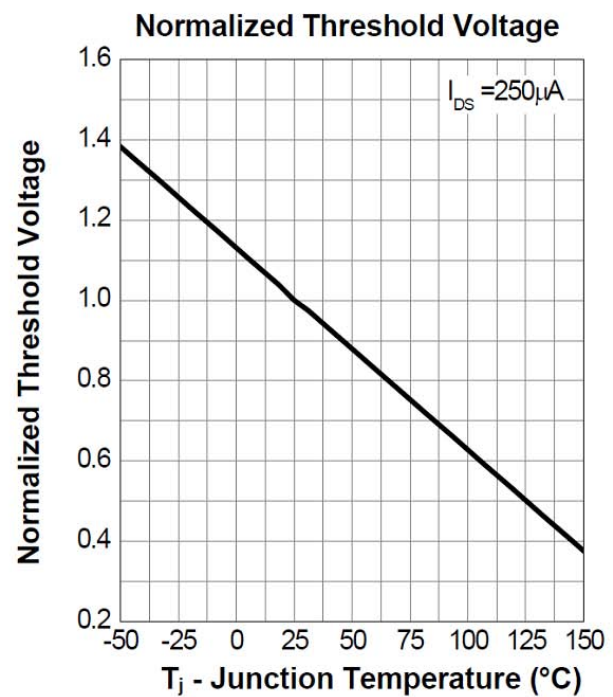
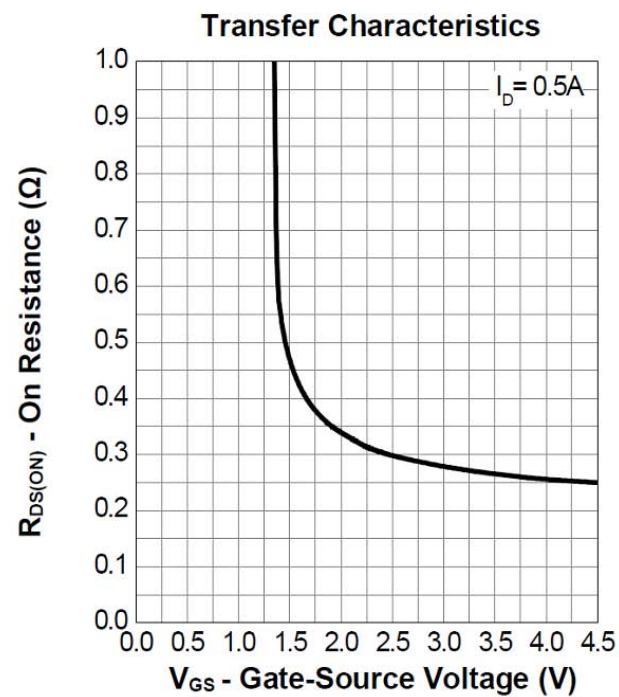
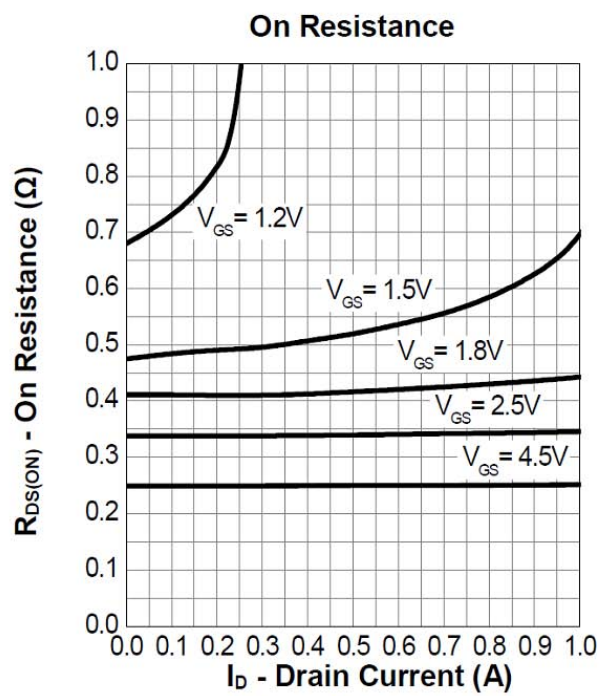
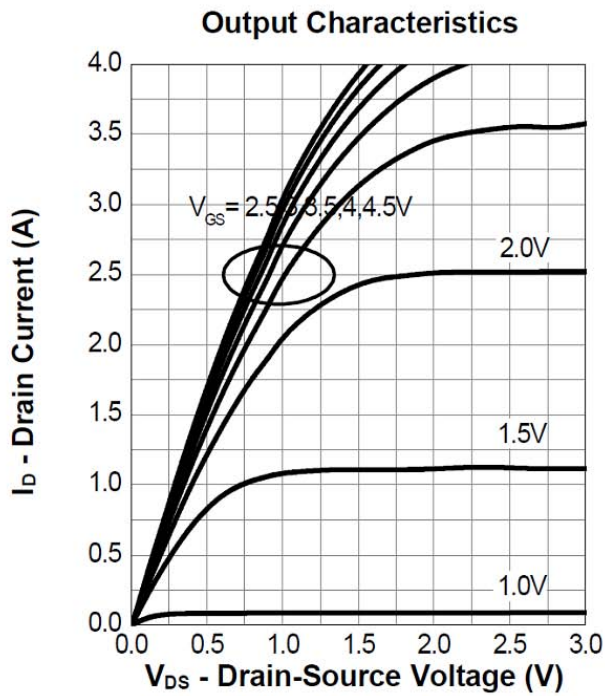
| Symbol | Parameter | Condition | Min. | Typ. | Max. | Units |
|--|---|--|------|------|----------|------------|
| Static Parameters | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 20 | -- | -- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=20V, V_{GS}=0V$ | -- | -- | 100 | nA |
| I_{GSS} | Gate-Body Leakage Current | $V_{DS}=0V, V_{GS}=\pm 8V$ | -- | -- | ± 10 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.4 | 0.7 | 1.0 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance ^B | $V_{GS}=4.5V, I_D=0.5A$ | -- | 250 | 380 | m Ω |
| | | $V_{GS}=2.5V, I_D=0.2A$ | -- | 300 | 440 | m Ω |
| | | $V_{GS}=1.8V, I_D=0.1A$ | -- | 370 | 530 | m Ω |
| V_{SD} | Forward Voltage | $I_{SD}=0.5A, V_{GS}=0V$ | -- | -- | 1.2 | V |
| Dynamic Parameters ^C | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V, V_{DS}=10V$ $f=1\text{MHz}$ | -- | 67 | -- | pF |
| C_{oss} | Output Capacitance | | -- | 18 | -- | pF |
| C_{rss} | Reverse Transfer Capacitance | | -- | 6 | -- | pF |
| Q_g | Total Gate Charge | $V_{DD}=10V, I_D=0.5A$ $V_{GS}=4.5V$ | -- | 1.4 | -- | nC |
| Q_{gs} | Gate-Source Charge | | -- | 0.21 | -- | nC |
| Q_{gd} | Gate-Drain Charge | | -- | 0.21 | -- | nC |
| $t_{D(on)}$ | Turn-on Delay Time | $V_{DD}=10V$ $I_D=0.15A,$ $R_{GEN}=10\Omega,$ $V_{GS}=4V$ | -- | 2.8 | -- | nS |
| t_r | Turn-on Rise Time | | -- | 20 | -- | nS |
| $t_{D(off)}$ | Turn-off Delay Time | | -- | 23 | -- | nS |
| t_f | Turn-off Fall Time | | -- | 24 | -- | nS |

A. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 2OZ copper.

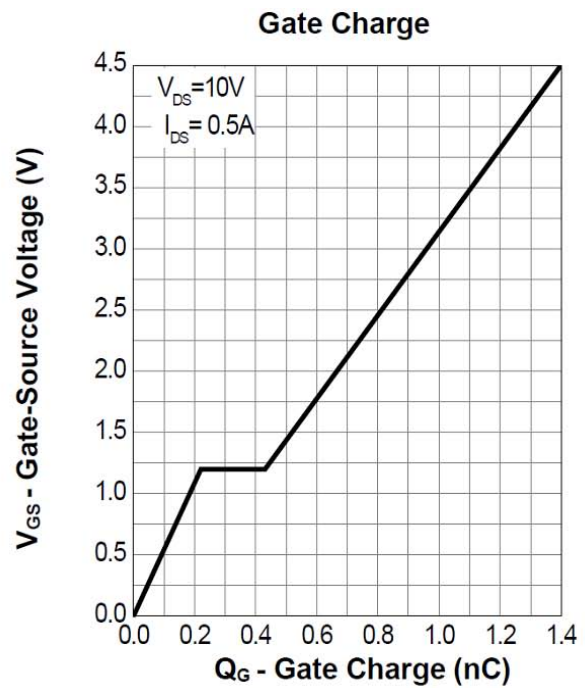
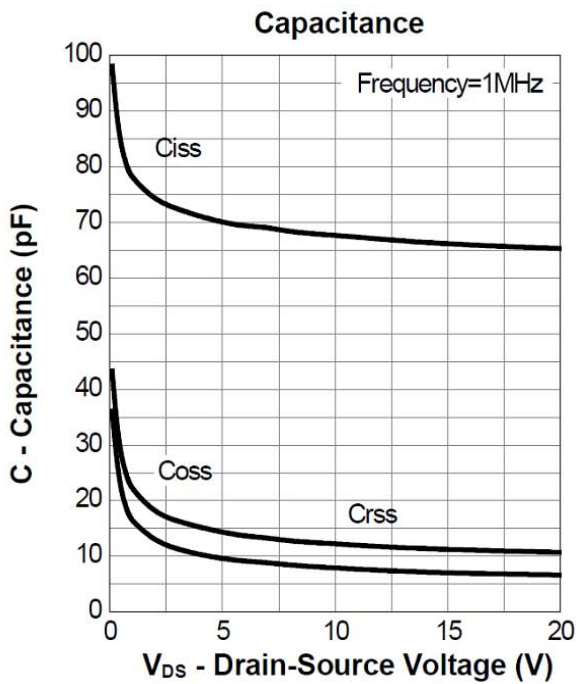
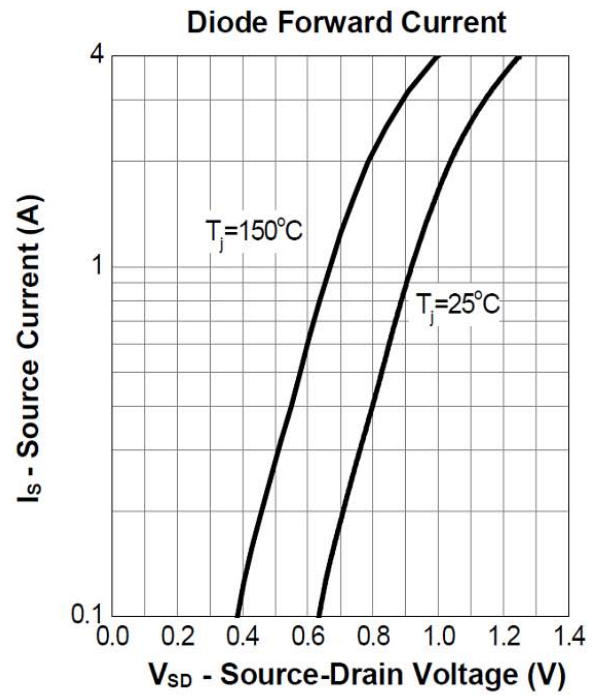
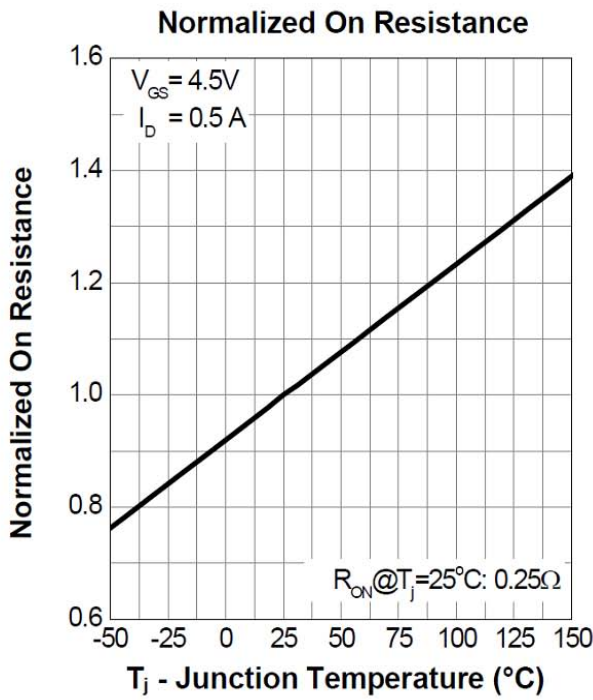
B. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

C. Guaranteed by design, not subject to production testing.

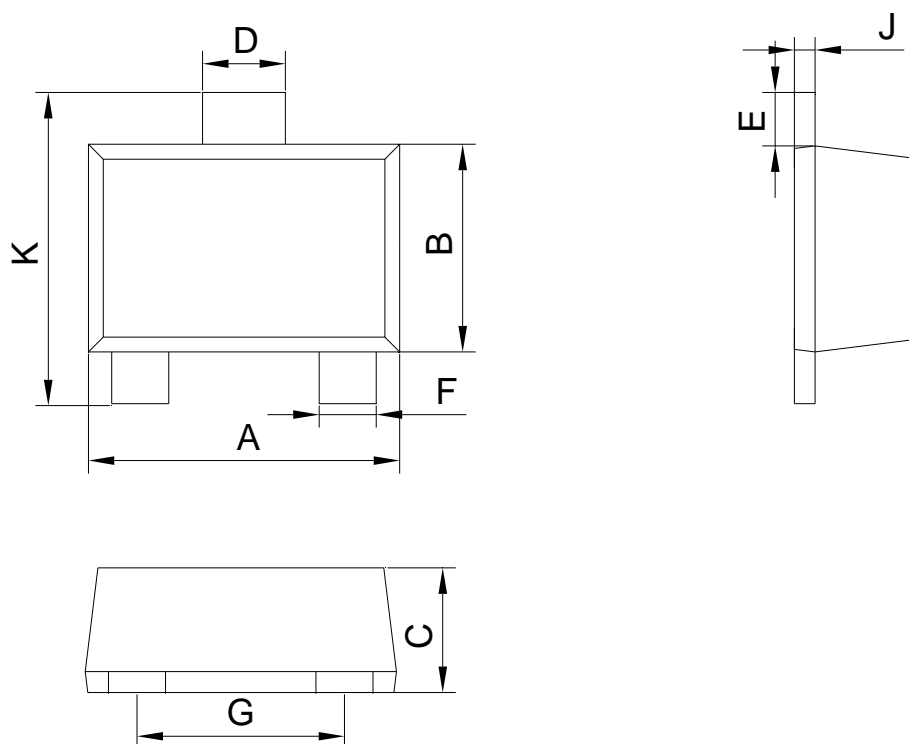
Typical Characteristics



Typical Characteristics



SOT-723 Package Information



| SOT-723 | | |
|---------|------|------|
| Dim | Min | Max |
| A | 1.10 | 1.30 |
| B | 0.70 | 0.90 |
| C | 0.40 | 0.54 |
| D | 0.22 | 0.42 |
| E | 0.10 | 0.30 |
| F | 0.12 | 0.32 |
| G | 0.70 | 0.90 |
| J | 0.08 | 0.15 |
| K | 1.10 | 1.30 |