# P-Channel 20V(D-S) MOSFET

| Product summary | | |
|---|---|---|
| $V_{DS}$ | -20 | V |
| $R_{DS(ON)}$(at $V_{GS}$=-4.5V) Typ. | 350 | mΩ |
| $R_{DS(ON)}$(at $V_{GS}$=-2.5V) Typ. | 440 | mΩ |
| $I_D$($T_A$=25℃) | -0.7 | A |

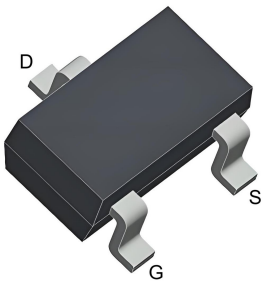
## Features

- Low Input Capacitance
- Fast Switching Speed
- Low Gate Threshold Voltage

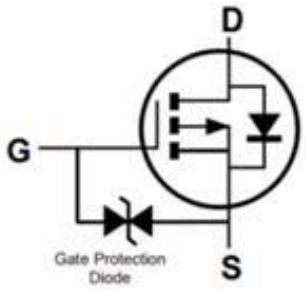
## Applications

- Load Switching
- Logic Level Shift

## Pin Configuration




SOT-523




## Packing Information

| Device | Package | Reel Size | Quantity(Min. Package) |
|---|---|---|---|
| ECDH1013E | SOT-523 | 7″ | 3000pcs |

## Absolute Maximum Ratings (at TA=25℃ Unless Otherwise Noted)

| Symbol | Parameter | | Rating | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | | -20 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±6 | V |
| $I_D$ | Continuous Drain Current at $V_{GS}$=10V | $T_A$=25℃ | -0.7 | A |
| | | $T_A$=70℃ | -0.57 | A |
| $I_{DM}$ | Pulse Drain Current Tested [A] | | -3 | A |
| $P_D$ | Power Dissipation | $T_A$=25℃ | 0.27 | W |
| $T_J$,$T_{STG}$ | Junciton and Storage Temperature Range | | -55 to +150 | ℃ |

## Thermal Characteristics

| Symbol | Parameter | Typical | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance-Junction to ambient [B] | 463 | ℃/W |

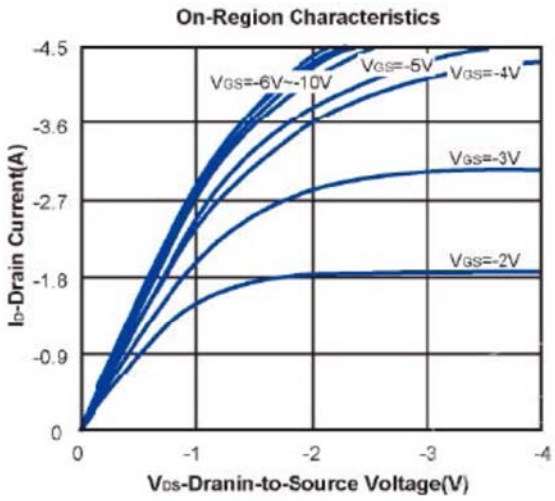
## Electrical Characteristics (at $T_J$ =25℃ Unless Otherwise Noted)

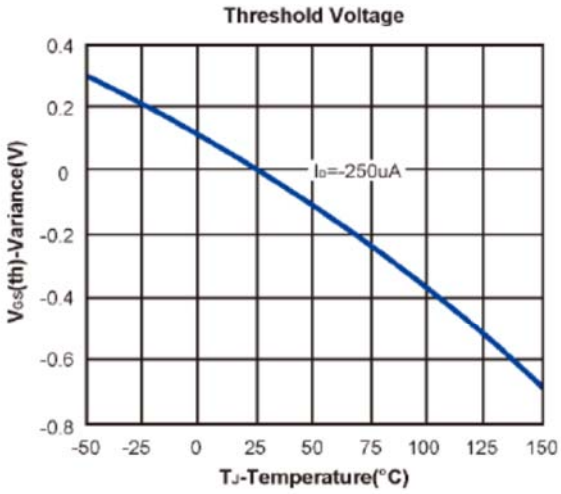
| Symbol | Parameter | Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Static Parameters | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V,$I_D$=-250uA | -20 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-20V,$V_{GS}$=0V | -- | -- | -1 | uA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{DS}$=0V,$V_{GS}$=±4.5V | -- | -- | ±10 | uA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=-250uA | -0.45 | -- | -1.2 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=-4.5V,$I_D$=-0.7A | -- | 350 | 480 | mΩ |
| | | $V_{GS}$=-2.5V,$I_D$=-0.6A | -- | 440 | 670 | mΩ |
| | | $V_{GS}$=-1.8V,$I_D$=-0.1A | -- | 780 | 2200 | mΩ |
| $V_{SD}$ | Forward Voltage | $I_{SD}$=-0.35A,$V_{GS}$=0V | -- | -- | -1.2 | V |
| Dynamic and Switching Parameters | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V,$V_{DS}$=-16V f=1MHZ | -- | 152 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 18 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 6 | -- | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-16V,$I_D$=-0.2A $V_{GS}$=-4.5V | -- | 2.8 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 2.1 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 0.5 | -- | nC |
| $t_{D(on)}$ | Turn-on Delay Time | $V_{DD}$=-10V $I_D$=-0.2A, $R_{GEN}$=10Ω, $V_{GS}$=-5V | -- | 51.3 | -- | ns |
| $t_r$ | Turn-on Rise Time | | -- | 24.2 | -- | ns |
| $t_{D(off)}$ | Turn-off Delay Time | | -- | 246 | -- | ns |
| $t_f$ | Turn-off Fall Time | | -- | 81.2 | -- | ns |

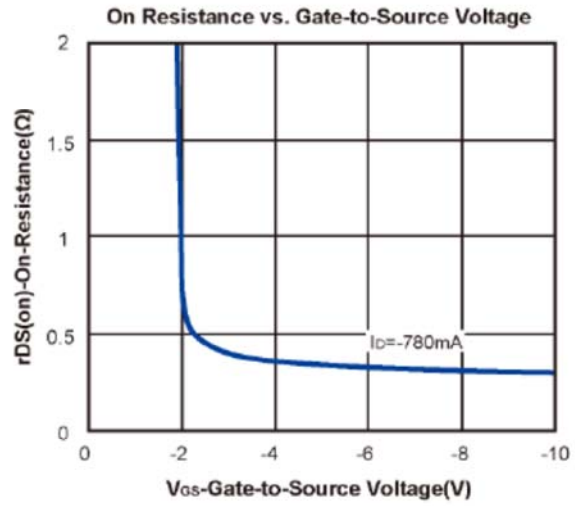
A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

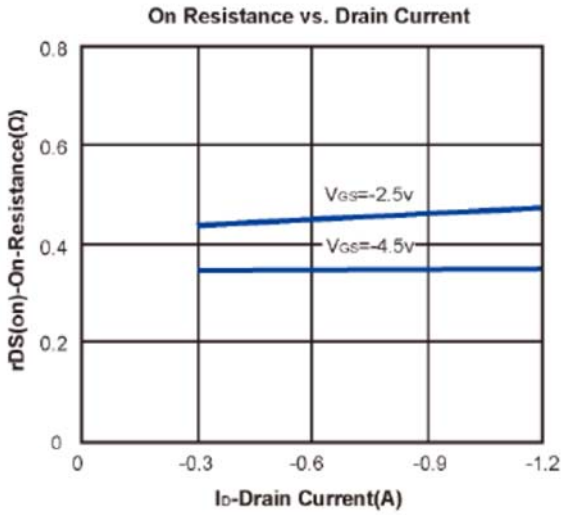
B. Device mounted on FR-4 PCB, 1 inch x 1 inch x 0.062 inch.

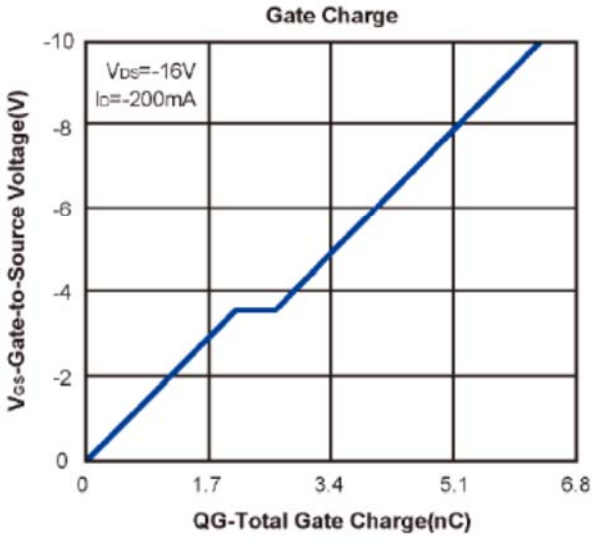
## Typical Characteristics

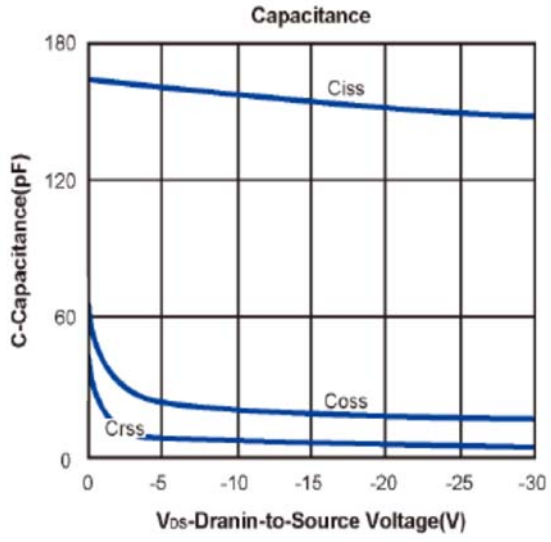


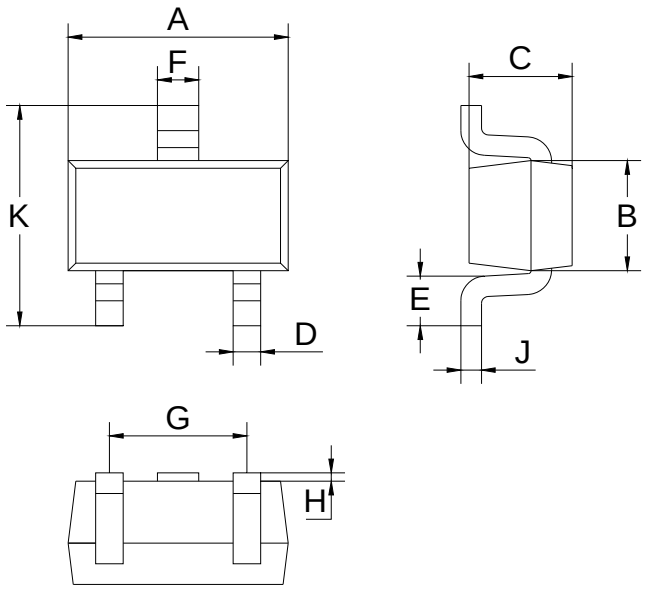



## SOT-523 Package Information




| SOT-523(mm) | | |
|---|---|---|
| Dim | Min | Max |
| A | 1.50 | 1.70 |
| B | 0.75 | 0.85 |
| C | 0.60 | 0.80 |
| D | 0.15 | 0.30 |
| E | 0.30 | 0.40 |
| F | 0.25 | 0.40 |
| G | 0.90 | 1.10 |
| H | 0.02 | 0.10 |
| J | 0.08 | 0.18 |
| K | 1.45 | 1.75 |

## Recommended Pad outline