

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

FDC5614P

Product specification

Features

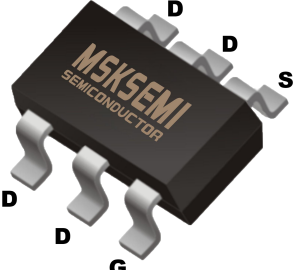
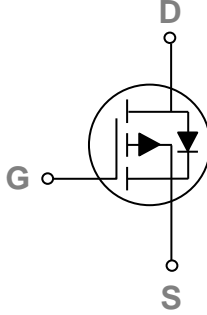

- -60V, -3.3A, $R_{DS(ON)} = 80\text{m}\Omega @ V_{GS} = -10\text{V}$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

| BVDSS | RDSON | ID |
|-------|--------------|-------|
| -60V | 80m Ω | -3.3A |

Reference News

| PACKAGE OUTLINE | PIN Configuration | Marking |
|--|--|--|
|  SOT-23-6 |  |  |

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|-----------|---|------------|---------------------|
| V_{DS} | Drain-Source Voltage | -60 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Drain Current - Continuous ($T_A=25^\circ\text{C}$) | -3.3 | A |
| | Drain Current - Continuous ($T_A=70^\circ\text{C}$) | -2.6 | A |
| I_{DM} | Drain Current - Pulsed ¹ | -13.2 | A |
| P_D | Power Dissipation ($T_A=25^\circ\text{C}$) | 2 | W |
| | Power Dissipation - Derate above 25°C | 0.016 | W/ $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature Range | -55 to 125 | $^\circ\text{C}$ |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 62.5 | $^\circ\text{C/W}$ |

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------|--------------------------------|--|------|------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V , I _D =-250uA | -60 | --- | --- | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =-60V , V _{GS} =0V , T _J =25℃ | --- | --- | -1 | uA |
| | | V _{DS} =-48V , V _{GS} =0V , T _J =125℃ | --- | --- | -10 | uA |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V , V _{DS} =0V | --- | --- | ±100 | nA |

On Characteristics

| | | | | | | |
|---------------------|-----------------------------------|---|------|------|------|----|
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =-10V , I _D =-2A | --- | 80 | 105 | mΩ |
| | | V _{GS} =-4.5V , I _D =-1A | --- | 100 | 130 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =-250uA | -1.0 | -1.6 | -2.5 | V |
| g _{fs} | Forward Transconductance | V _{DS} =-10V , I _D =-1A | --- | 3 | --- | S |

Dynamic and switching Characteristics

| | | | | | | |
|---------------------|-------------------------------------|---|-----|------|-----|----|
| Q _g | Total Gate Charge ^{3, 4} | V _{DS} =-30V , V _{GS} =-10V , I _D =-1A | --- | 10 | --- | nC |
| Q _{gs} | Gate-Source Charge ^{3, 4} | | --- | 1.6 | --- | |
| Q _{gd} | Gate-Drain Charge ^{3, 4} | | --- | 3 | --- | |
| T _{d(on)} | Turn-On Delay Time ^{3, 4} | V _{DD} =-30V , V _{GS} =-10V , R _G =6Ω I _D =-1A | --- | 8 | --- | ns |
| T _r | Rise Time ^{3, 4} | | --- | 15.4 | --- | |
| T _{d(off)} | Turn-Off Delay Time ^{3, 4} | | --- | 42.8 | --- | |
| T _f | Fall Time ^{3, 4} | | --- | 8.4 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =-30V , V _{GS} =0V , F=1MHz | --- | 720 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 42 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 32 | --- | |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, F=1MHz | --- | 22 | --- | Ω |

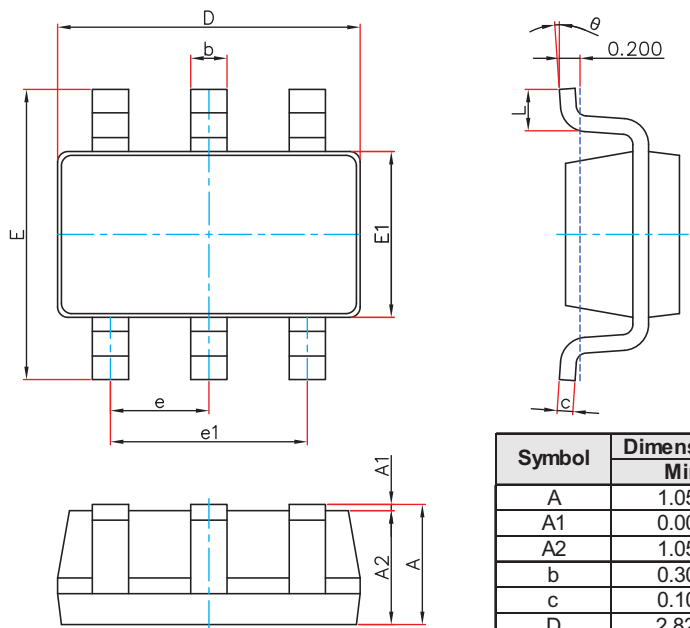
Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|---|------|------|------|------|
| I _S | Continuous Source Current | V _G =V _D =0V , Force Current | --- | --- | -3.3 | A |
| I _{SM} | Pulsed Source Current | | --- | --- | -6.6 | A |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V , I _S =-1A , T _J =25℃ | --- | --- | -1.2 | V |
| t _{rr} | Reverse Recovery Time | V _R =-50V, I _S =-1A | --- | 30 | --- | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt=100A/μs, T _J =25℃ | --- | 15 | --- | nC |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-18A, R_G=25Ω, Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

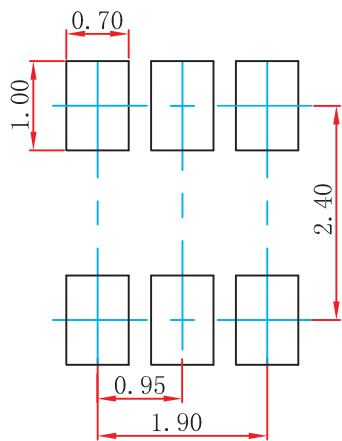
SOT-23-6 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

M 2012 P A

SOT-23-6 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

| P/N | PKG | QTY |
|----------|----------|------|
| FDC5614P | SOT-23-6 | 3000 |

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