



SI1428EDH

| PRODUCT SUMMARY | | | |
|---------------------|----------------------------------|---------------------------------|-----------------------|
| V _{DS} (V) | R _{DS(on)} (Ω) | I _D (A) ^a | Q _g (Typ.) |
| 30 | 0.045 at V _{GS} = 10 V | 4 | 4 nC |
| | 0.049 at V _{GS} = 4.5 V | 4 | |
| | 0.060 at V _{GS} = 2.5 V | 4 | |

FEATURES

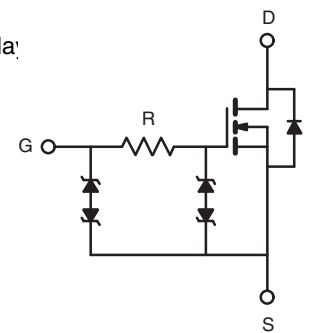
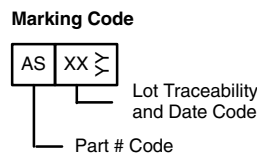
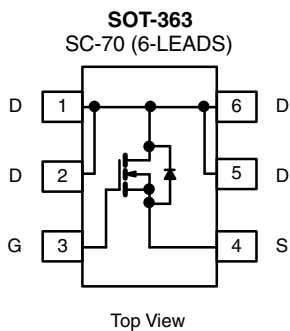
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- Typical ESD Protection 2000 V HBM
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Portable Devices
 - Load Switch
 - Battery Switch
- Load Switch for Motors, Relays



Ordering Information: Si1428EDH-T1-GE3 (Lead (Pb)-free and Halogen-free)

| ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted) | | | | |
|---|-----------------------------------|------------------------|------|--|
| Parameter | Symbol | Limit | Unit | |
| Drain-Source Voltage | V _{DS} | 30 | V | |
| Gate-Source Voltage | V _{GS} | ± 12 | | |
| Continuous Drain Current (T _J = 150 °C) | I _D | T _C = 25 °C | A | |
| | | T _C = 70 °C | | |
| | | T _A = 25 °C | | |
| | | T _A = 70 °C | | |
| Pulsed Drain Current (t = 300 μs) | I _{DM} | 20 | | |
| Continuous Source-Drain Diode Current | I _S | T _C = 25 °C | W | |
| | | T _A = 25 °C | | |
| Maximum Power Dissipation | P _D | T _C = 25 °C | W | |
| | | T _C = 70 °C | | |
| | | T _A = 25 °C | | |
| | | T _A = 70 °C | | |
| Operating Junction and Storage Temperature Range | T _J , T _{stg} | - 55 to 150 | °C | |

| THERMAL RESISTANCE RATINGS | | | | | |
|---|-------------------|---------|---------|------|--|
| Parameter | Symbol | Typical | Maximum | Unit | |
| Maximum Junction-to-Ambient ^{b, d} | R _{thJA} | 60 | 80 | °C/W | |
| Maximum Junction-to-Foot (Drain) | R _{thJF} | 34 | 45 | | |

Notes:

- a. Package limited, T_C = 25 °C.
- b. Surface mounted on 1" x 1" FR4 board.
- c. t = 5 s.
- d. Maximum under steady state conditions is 125 °C/W.



SI1428EDH

| SPECIFICATIONS (T _J = 25 °C, unless otherwise noted) | | | | | | |
|---|--------------------------------------|--|------|-------|-------|-------|
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{DS} | V _{GS} = 0 V, I _D = 250 μA | 30 | | | V |
| V _{DS} Temperature Coefficient | ΔV _{DS} /T _J | I _D = 250 μA | | 23 | | mV/°C |
| V _{GS(th)} Temperature Coefficient | ΔV _{GS(th)} /T _J | | | - 3.2 | | |
| Gate-Source Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 0.6 | | 1.3 | V |
| Gate-Source Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 4.5 V | | | ± 0.5 | μA |
| | | V _{DS} = 0 V, V _{GS} = ± 12 V | | | ± 25 | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 30 V, V _{GS} = 0 V | | | 1 | |
| | | V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C | | | 10 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 4.5 V | 15 | | | A |
| Drain-Source On-State Resistance ^a | R _{DS(on)} | V _{GS} = 10 V, I _D = 3.7 A | | 0.036 | 0.045 | Ω |
| | | V _{GS} = 4.5 V, I _D = 3.6 A | | 0.040 | 0.049 | |
| | | V _{GS} = 2.5 V, I _D = 1.5 A | | 0.048 | 0.060 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 3.7 A | | 17 | | S |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 15 V, V _{GS} = 10 V, I _D = 4.7 A | | 8.8 | 13.5 | nC |
| | | | | 4 | 6 | |
| | | | | 0.9 | | |
| Gate-Source Charge | Q _{gs} | V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 4.7 A | | 1.1 | | |
| Gate-Drain Charge | Q _{gd} | | | | | |
| Gate Resistance | R _g | f = 1 MHz | 0.4 | 2 | 4 | kΩ |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 15 V, R _L = 4.1 Ω I _D ≈ 3.7 A, V _{GEN} = 4.5 V, R _g = 1 Ω | | 0.29 | 0.58 | μs |
| Rise Time | t _r | | | 0.4 | 0.8 | |
| Turn-Off DelayTime | t _{d(off)} | | | 1.9 | 3.8 | |
| Fall Time | t _f | | | 0.75 | 1.5 | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 15 V, R _L = 4.1 Ω I _D ≈ 3.7 A, V _{GEN} = 10 V, R _g = 1 Ω | | 0.1 | 0.2 | |
| Rise Time | t _r | | | 0.15 | 0.3 | |
| Turn-Off DelayTime | t _{d(off)} | | | 3 | 6 | |
| Fall Time | t _f | | | 0.75 | 1.5 | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Source-Drain Diode Current | I _S | T _C = 25 °C | | | 2.3 | A |
| Pulse Diode Forward Current | I _{SM} | | | | 20 | |
| Body Diode Voltage | V _{SD} | I _S = 3.7 A, V _{GS} = 0 V | | 0.85 | 1.2 | V |
| Body Diode Reverse Recovery Time | t _{rr} | I _F = 3.7 A, dI/dt = 100 A/μs, T _J = 25 °C | | 12 | 25 | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | | | 5 | 10 | nC |
| Reverse Recovery Fall Time | t _a | | | 6.5 | | ns |
| Reverse Recovery Rise Time | t _b | | | 5.5 | | |

Notes:

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.