

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

Send any inquiries to <http://www.renesas.com/inquiry>.

Not recommended
for new design

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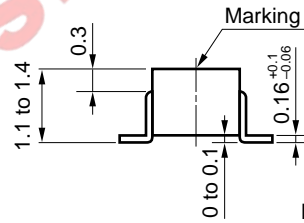
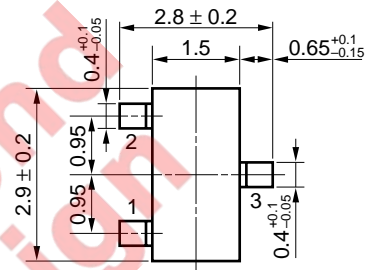
N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

The 2SK2158 is an N-channel vertical type MOS FET featuring an operating voltage as low as 1.5 V. Because it can be driven on a low voltage and it is not necessary to consider driving current, the 2SK2158 is suitable for use in low-voltage portable systems such as headphone stereo sets and camcorders.

FEATURES

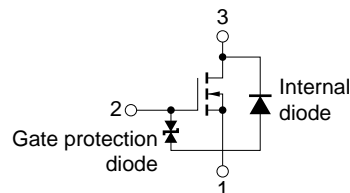
- Capable of drive gate with 1.5 V
- Because of high input impedance, there is no need to consider driving current.
- Bias resistance can be omitted, enabling reduction in total number of parts.

PACKAGE DIMENSIONS
(in millimeters)



Marking: G23

EQUIVALENT CIRCUIT



PIN CONNECTION

1. Source (S)
2. Gate (G)
3. Drain (D)

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

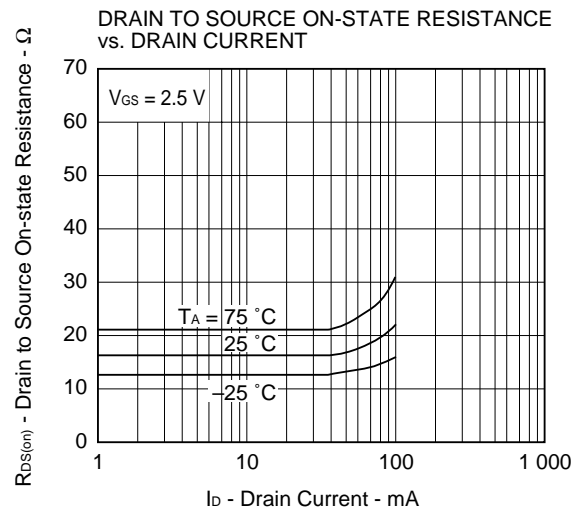
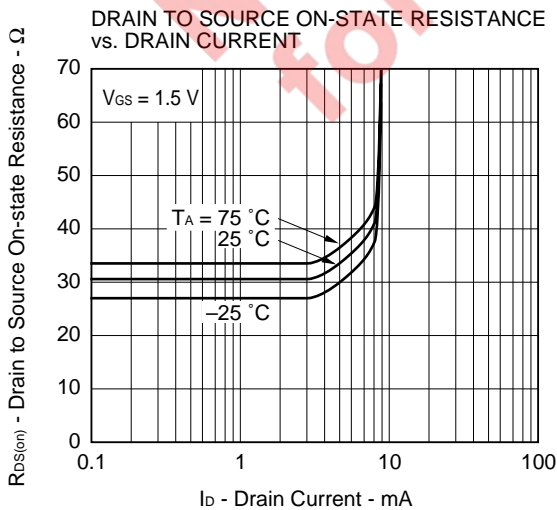
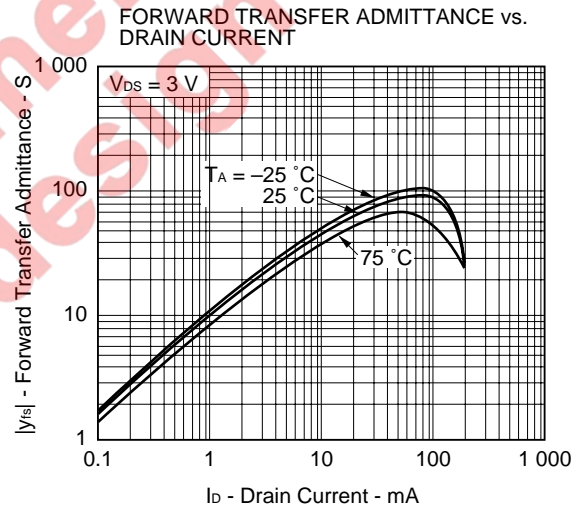
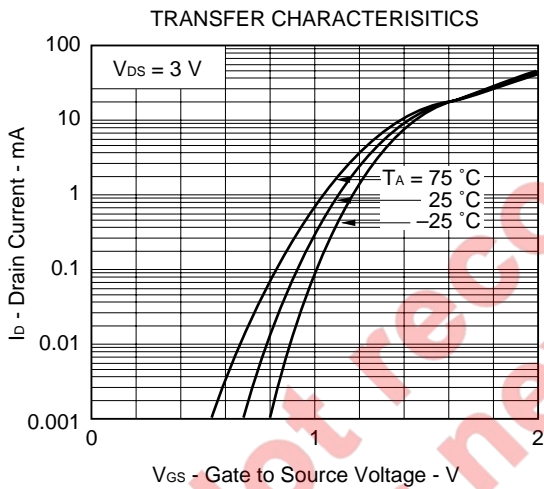
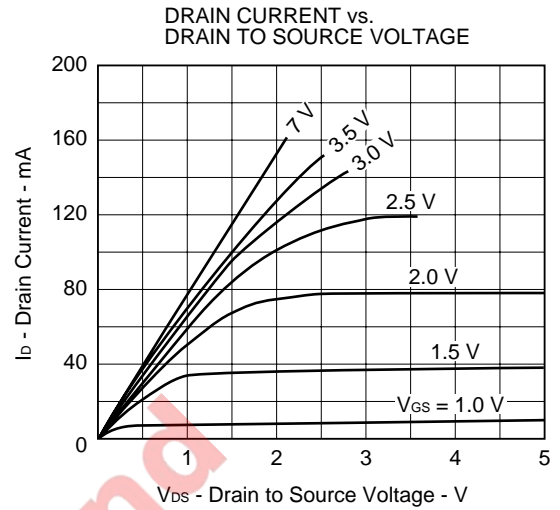
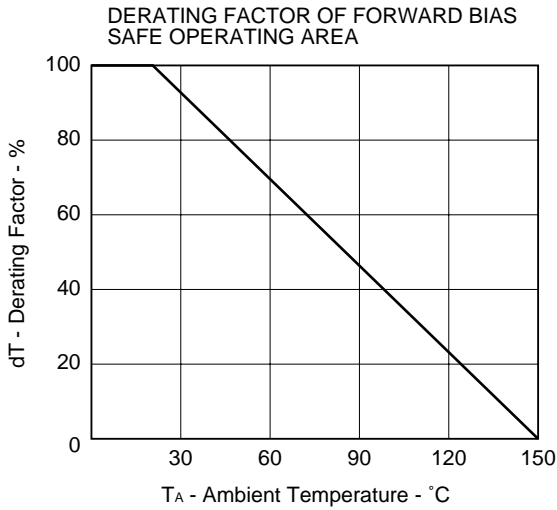
| PARAMETER | SYMBOL | TEST CONDITIONS | RATINGS | UNIT |
|-------------------------|-----------------------|----------------------------------|-------------|------|
| Drain to Source Voltage | V _{DSS} | V _{GS} = 0 | 50 | V |
| Gate to Source Voltage | V _{GSS} | V _{DS} = 0 | ±7.0 | V |
| Drain Current (DC) | I _{D(DC)} | | ±0.1 | A |
| Drain Current (pulse) | I _{D(pulse)} | PW ≤ 10 ms, Duty Cycle ≤ 50 % | ±0.2 | A |
| Total Power Dissipation | P _T | | 200 | mW |
| Channel Temperature | T _{ch} | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

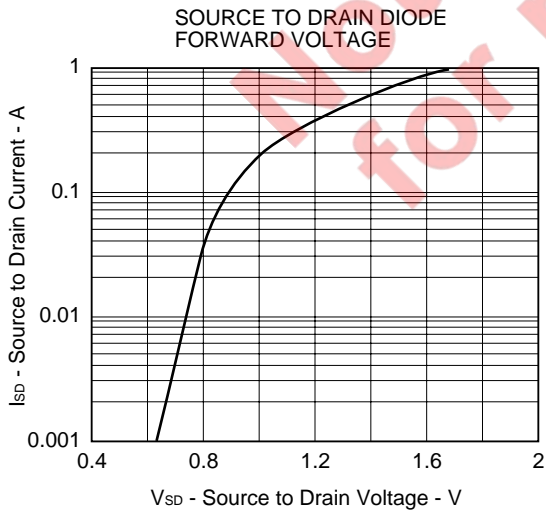
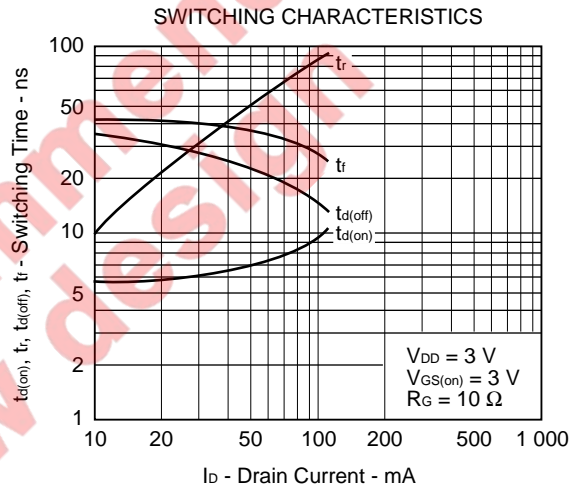
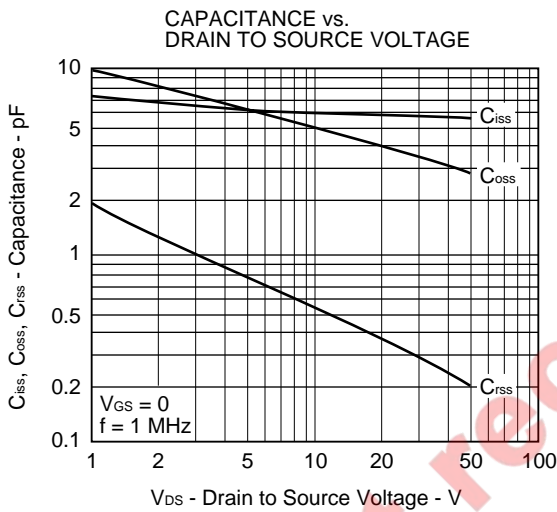
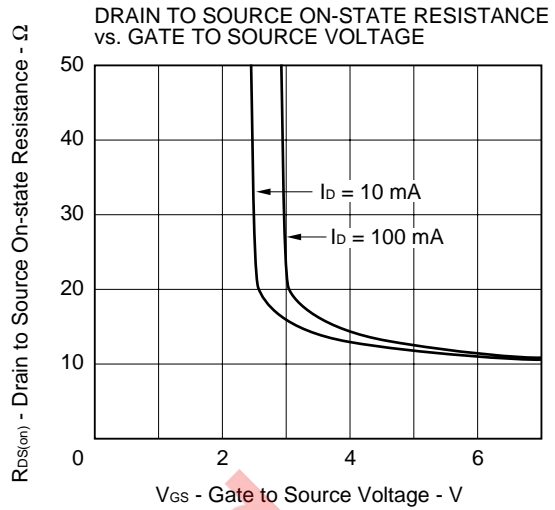
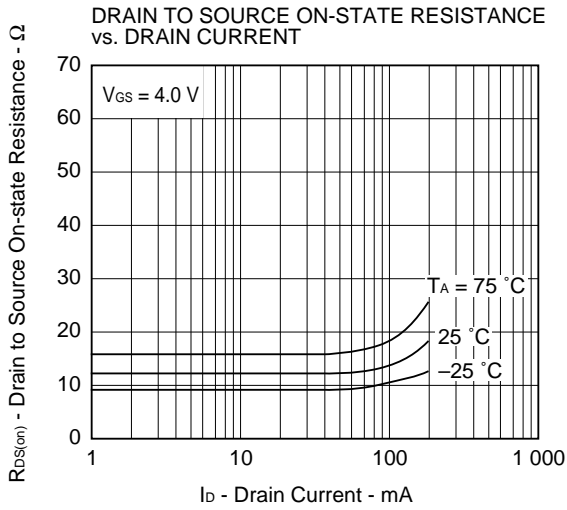
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|----------------------|--|------|------|------|------|
| Drain Cut-off Current | I _{DSS} | V _{DS} = 50 V, V _{GS} = 0 | | | 1.0 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±7.0 V, V _{DS} = 0 | | | ±3.0 | μA |
| Gate Cut-off Voltage | V _{GS(off)} | V _{DS} = 3 V, I _D = 1.0 μA | 0.5 | 0.7 | 1.1 | V |
| Forward Transfer Admittance | y _{fs} | V _{DS} = 3 V, I _D = 10 mA | 20 | | | mS |
| Drain to Source On-state Resistance | R _{DS(on)1} | V _{GS} = 1.5 V, I _D = 1.0 mA | | 32 | 50 | Ω |
| Drain to Source On-state Resistance | R _{DS(on)2} | V _{GS} = 2.5 V, I _D = 10 mA | | 16 | 20 | Ω |
| Drain to Source On-state Resistance | R _{DS(on)3} | V _{GS} = 4.0 V, I _D = 10 mA | | 12 | 15 | Ω |
| Input Capacitance | C _{iss} | V _{DS} = 3 V, V _{GS} = 0 | | 6 | | pF |
| Output Capacitance | C _{oss} | f = 1.0 MHz | | 8 | | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 1 | | pF |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 3 V, I _D = 20 mA | | 9 | | ns |
| Rise Time | t _r | V _{GS(on)} = 3 V, R _G = 10 Ω | | 48 | | ns |
| Turn-Off Delay Time | t _{d(off)} | R _L = 150 Ω | | 21 | | ns |
| Fall Time | t _f | | | 31 | | ns |

Not recommended for new designs

TYPICAL CHARACTERISTICS (T_A = 25 °C)





REFERENCE

| Document Name | Document No. |
|---|--------------|
| NEC semiconductor device reliability/quality control system | TEI-1202 |
| Quality grade on NEC semiconductor devices | IEI-1209 |
| Semiconductor device mounting technology manual | C10535E |
| Guide to quality assurance for semiconductor devices | MEI-1202 |
| Semiconductor selection guide | X10679E |

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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

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