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April 1st, 2010
Renesas Electronics Corporation

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

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for new design

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FY8AAJ-03F

High-Speed Switching Use
Nch Power MOS FET

REJ03G0280-0100

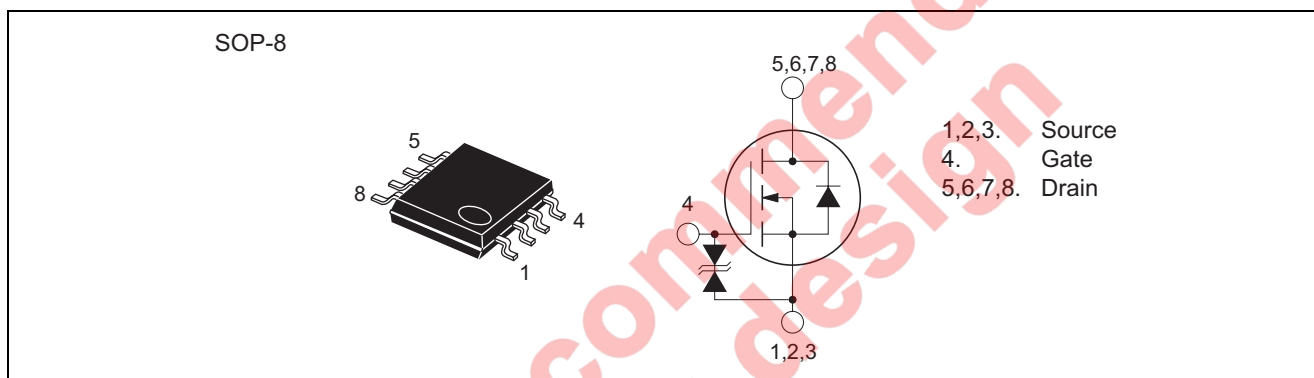
Rev.1.00

Aug.20.2004

Features

- Drive voltage : 4 V
- V_{DSS} : 30 V
- $r_{DS(ON) (max)}$: 28 m Ω
- I_D : 8 A

Outline



Applications

Motor control, lamp control, solenoid control, DC-DC converters, etc.

Maximum Ratings

($T_c = 25^\circ\text{C}$)

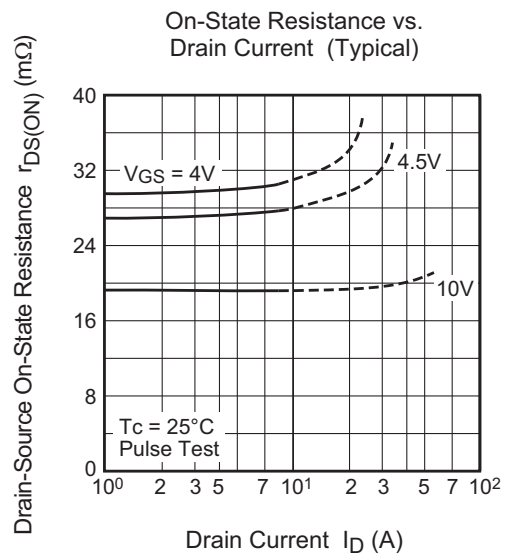
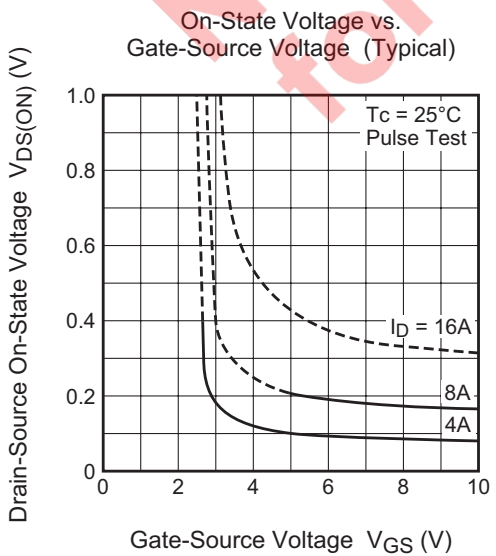
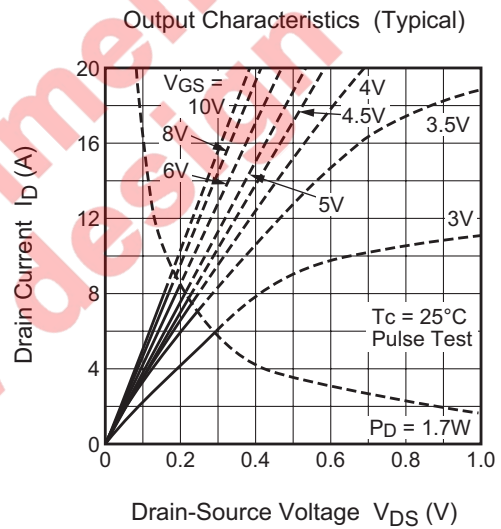
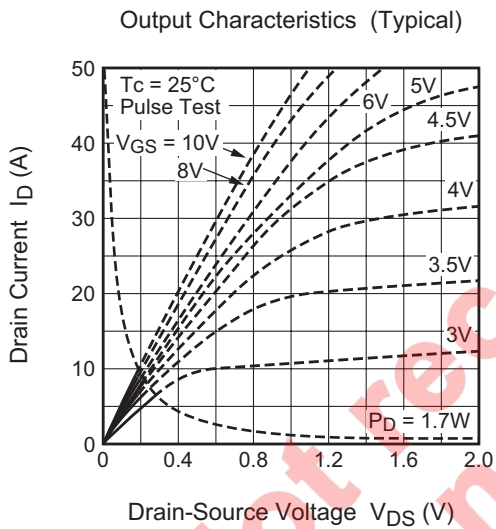
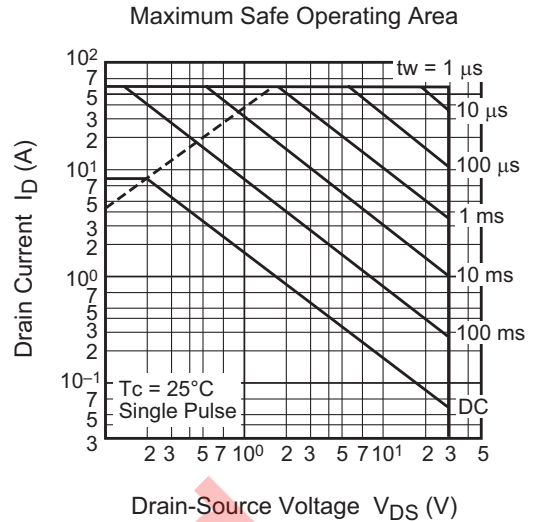
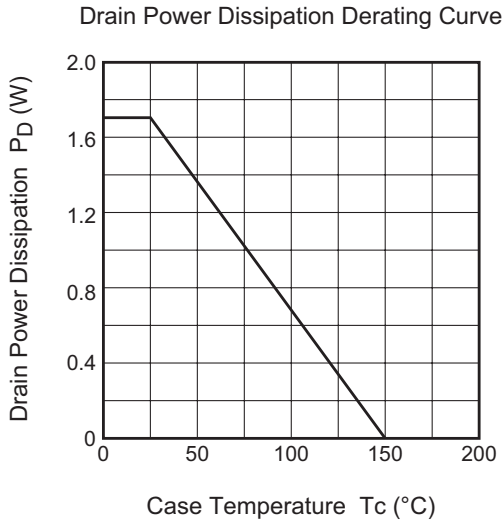
| Parameter | Symbol | Ratings | Unit | Conditions |
|----------------------------|-----------|--------------|------------------|-----------------------|
| Drain-source voltage | V_{DSS} | 30 | V | $V_{GS} = 0\text{ V}$ |
| Gate-source voltage | V_{GSS} | ± 20 | V | $V_{DS} = 0\text{ V}$ |
| Drain current | I_D | 8 | A | |
| Drain current (Pulsed) | I_{DM} | 56 | A | |
| Avalanche current (Pulsed) | I_{DA} | 8 | A | $L = 10\ \mu\text{H}$ |
| Source current | I_S | 1.5 | A | |
| Source current (Pulsed) | I_{SM} | 6.0 | A | |
| Maximum power dissipation | P_D | 1.7 | W | |
| Channel temperature | T_{ch} | - 55 to +150 | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | - 55 to +150 | $^\circ\text{C}$ | |
| Mass | — | 0.07 | g | Typical value |

Electrical Characteristics

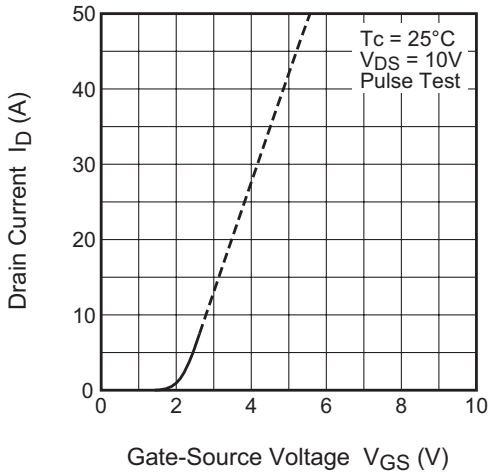
(Tch = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|----------------------------------|----------------|----------|-------|----------|----------------------|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 30 | — | — | V | $I_D = 1 \text{ mA}$, $V_{GS} = 0 \text{ V}$ |
| Gate-source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | V | $I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0 \text{ V}$ |
| Drain-source leakage current | I_{DSS} | — | — | 0.1 | mA | $V_{DS} = 30 \text{ V}$, $V_{GS} = 0 \text{ V}$ |
| Gate-source leakage current | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$ |
| Gate-source threshold voltage | $V_{GS(th)}$ | 1.0 | 1.5 | 2.0 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Drain-source on-state resistance | $r_{DS(ON)}$ | — | 22 | 28 | m Ω | $I_D = 8 \text{ A}$, $V_{GS} = 10 \text{ V}$ |
| Drain-source on-state resistance | $r_{DS(ON)}$ | — | 31 | 43 | m Ω | $I_D = 4 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ |
| Drain-source on-state resistance | $r_{DS(ON)}$ | — | 35 | 50 | m Ω | $I_D = 4 \text{ A}$, $V_{GS} = 4 \text{ V}$ |
| Drain-source on-state voltage | $V_{DS(ON)}$ | — | 0.176 | 0.224 | V | $I_D = 8 \text{ A}$, $V_{GS} = 10 \text{ V}$ |
| Forward transfer admittance | $ y_{fs} $ | — | 13 | — | S | $I_D = 8 \text{ A}$, $V_{DS} = 10 \text{ V}$ |
| Input capacitance | C_{iss} | — | 600 | — | pF | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 200 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 90 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 10 | — | ns | $V_{DD} = 15 \text{ V}$, $I_D = 4 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_G = 5 \text{ }\Omega$ |
| Rise time | t_r | — | 15 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 40 | — | ns | |
| Fall time | t_f | — | 6.5 | — | ns | |
| Total gate charge | Q_g | — | 13.8 | — | nC | $V_{DD} = 15 \text{ V}$, $I_D = 8 \text{ A}$, $V_{GS} = 10 \text{ V}$ |
| Gate-source charge | Q_{gs} | — | 1.6 | — | nC | |
| Gate-drain charge | Q_{gd} | — | 3.5 | — | nC | |
| Source-drain voltage | V_{SD} | — | 0.75 | 1.10 | V | $I_S = 1.5 \text{ A}$, $V_{GS} = 0 \text{ V}$ |
| Thermal resistance | $R_{th(ch-a)}$ | — | — | 73.5 | $^{\circ}\text{C/W}$ | Channel to air |
| Reverse recovery time | t_{rr} | — | 40 | — | ns | $I_S = 1.5 \text{ A}$, $di/dt = -50 \text{ A}/\mu\text{s}$ |

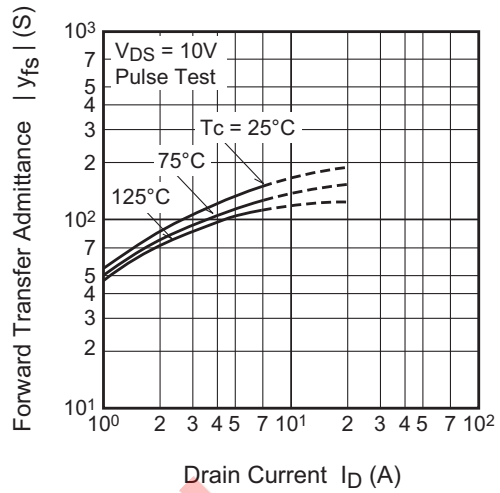
Performance Curves



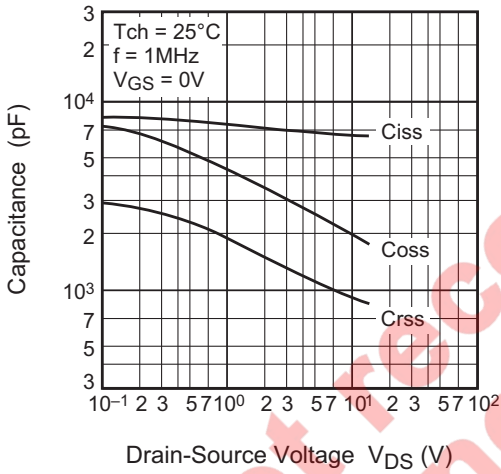
Transfer Characteristics (Typical)



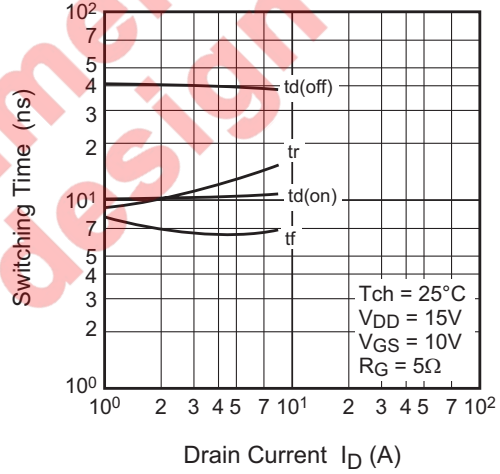
Forward Transfer Admittance vs. Drain Current (Typical)



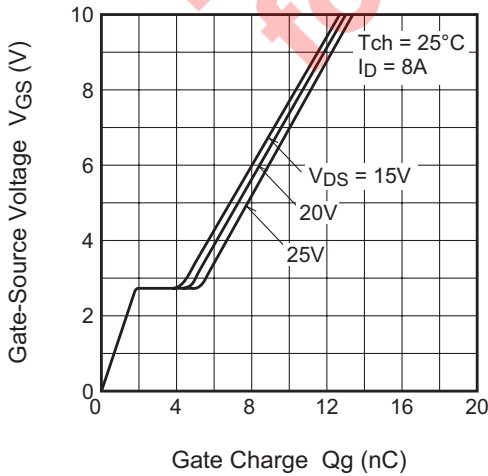
Capacitance vs. Drain-Source Voltage (Typical)



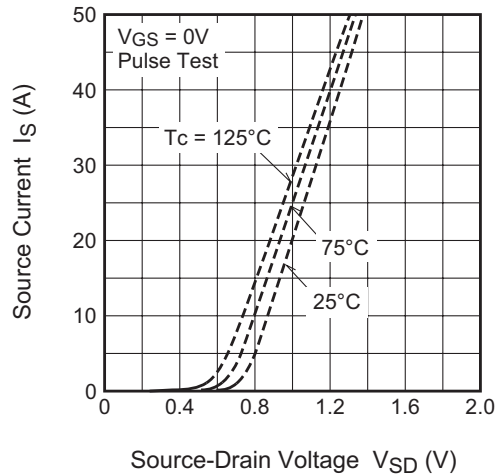
Switching Characteristics (Typical)

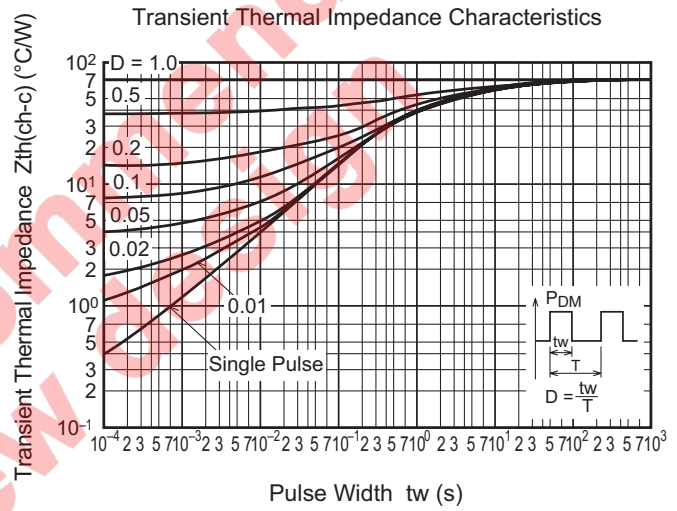
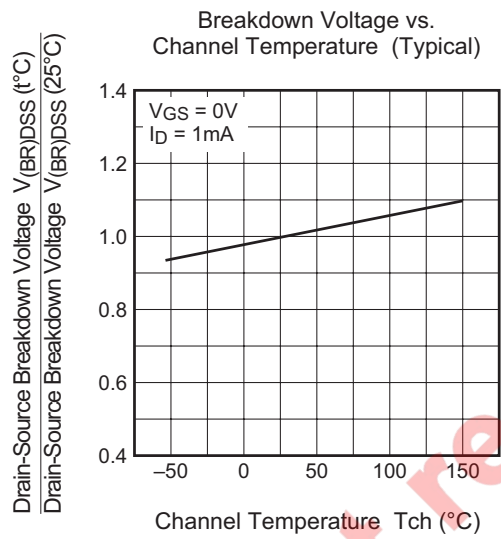
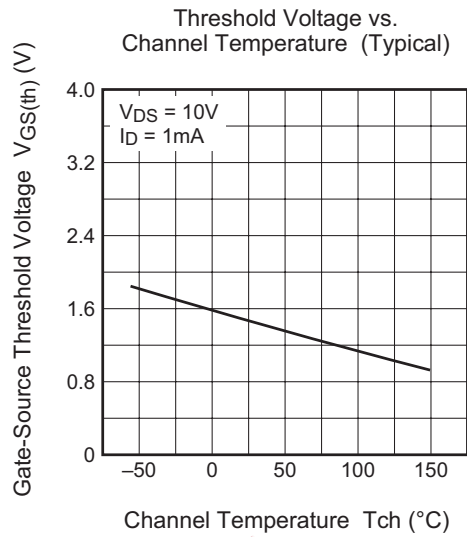
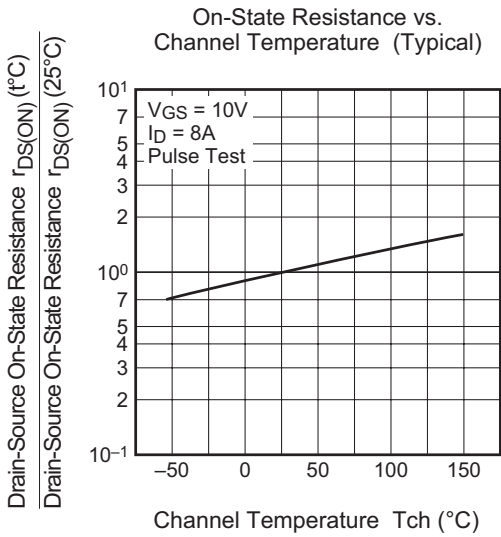


Gate-Source Voltage vs. Gate Charge (Typical)

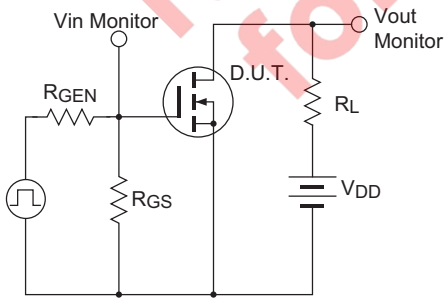


Source-Drain Diode Forward Characteristics (Typical)

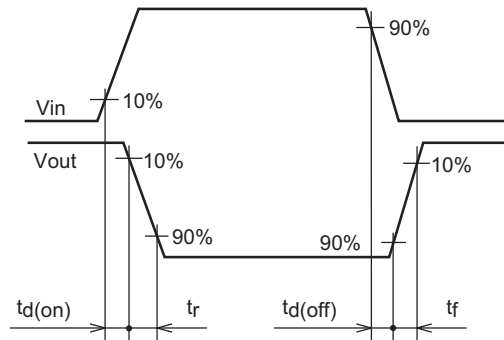




Switching Time Measurement Circuit



Switching Waveform



Package Dimensions

8P2S-B(SOP-8)

| | | | |
|-------------------|------------|----------------------------|---------------|
| EIAJ Package Code | JEDEC Code | Mass (g) (reference value) | Lead Material |
| — | Conforms | 0.07 | Cu alloy |

Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.

| Symbol | Dimension in Millimeters | | |
|----------------|--------------------------|-----|-----|
| | Min | Typ | Max |
| A | — | — | — |
| A ₁ | — | — | — |
| A ₂ | — | — | — |
| b | — | — | — |
| D | — | — | — |
| E | — | — | — |
| e | — | — | — |
| x | — | — | — |
| y | — | — | — |
| y ₁ | — | — | — |
| ZD | — | — | — |
| ZE | — | — | — |

Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|----------------------|-------------------------|----------|--------------------------------------|-----------------------------|
| Surface-mounted type | Taping | 3000 | Type name – T +Direction (1 or 2) +3 | FY8AAJ-03F-T13 |
| Surface-mounted type | Plastic Magazine (Tube) | 100 | Type name | FY8AAJ-03F |

Note : Please confirm the specification about the shipping in detail.

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