FS10AS-06

High-Speed Switching Use
Nch Power MOS FET

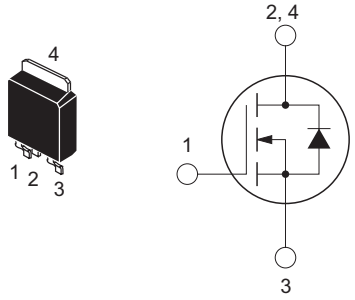
REJ03G0240-0100
Rev.1.00
Aug.20.2004

Features

- Drive voltage : 10 V
- V_{DSS} : 60 V
- $r_{DS(ON)\,(max)}$: 78 mΩ
- I_D : 10 A
- Recovery Time of the Integrated Fast Recovery Diode (TYP.) : 55 ns

Outline

MP-3A



1. Gate
2. Drain
3. Source
4. Drain

Applications

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

Maximum Ratings

(Tc = 25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	60	V	V_{GS} = 0 V
Gate-source voltage	V_{GSS}	±20	V	V_{DS} = 0 V
Drain current	I_D	10	A	
Drain current (Pulsed)	I_{DM}	40	A	
Avalanche current (Pulsed)	I_{DA}	10	A	L = 100 µH
Source current	I_S	10	A	
Source current (Pulsed)	I_{SM}	40	A	
Maximum power dissipation	P_D	30	W	
Channel temperature	Tch	– 55 to +150	°C	
Storage temperature	Tstg	– 55 to +150	°C	
Mass	—	0.32	g	Typical value

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Electrical Characteristics

(Tch = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	I_D = 1 mA, V_{GS} = 0 V
Gate-source leakage current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±20 V, V_{DS} = 0 V
Drain-source leakage current	I_{DSS}	—	—	0.1	mA	V_{DS} = 60 V, V_{GS} = 0 V
Gate-source threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	I_D = 1 mA, V_{DS} = 10 V
Drain-source on-state resistance	$r_{DS(ON)}$	—	58	78	mΩ	I_D = 5 A, V_{GS} = 10 V
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.29	0.39	mV	I_D = 5 A, V_{GS} = 10 V
Forward transfer admittance	$\lvert y_{fs} \rvert$	—	9.0	—	S	I_D = 5 A, V_{DS} = 5 V
Input capacitance	Ciss	—	600	—	pF	V_{DS} = 10 V, V_{GS} = 0 V, f = 1MHz
Output capacitance	Coss	—	180	—	pF	
Reverse transfer capacitance	Crss	—	60	—	pF	
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	V_{DD} = 30 V, I_D = 5 A, V_{GS} = 10 V, R_{GEN} = R_{GS} = 50 Ω
Rise time	t_r	—	22	—	ns	
Turn-off delay time	$t_{d(off)}$	—	30	—	ns	
Fall time	t_f	—	17	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	I_S = 5 A, V_{GS} = 0 V
Thermal resistance	Rth(ch-c)	—	—	4.17	°C/W	Channel to case
Reverse recovery time	t_{rr}	—	55	—	ns	I_S = 10 A, dis/dt = –100 A/µs

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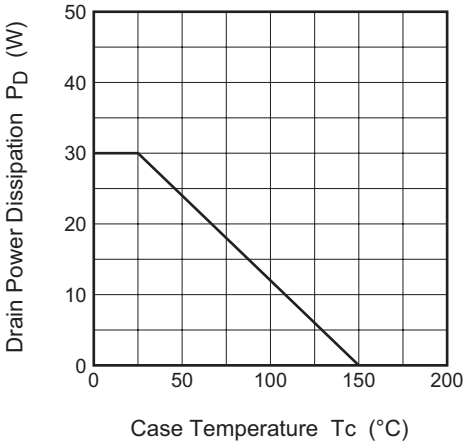
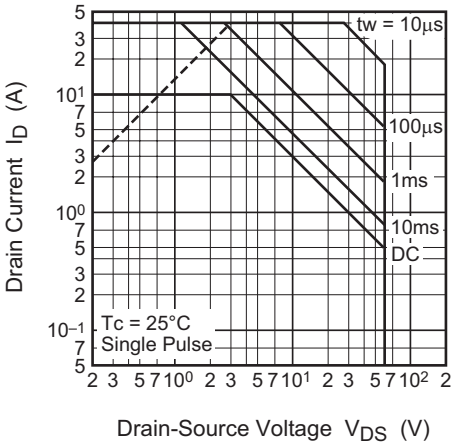
Performance Curves

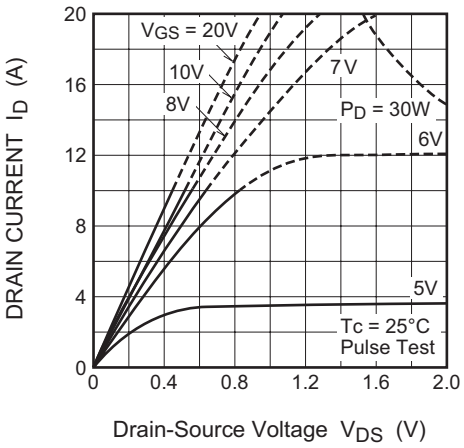
Drain Power Dissipation Derating Curve



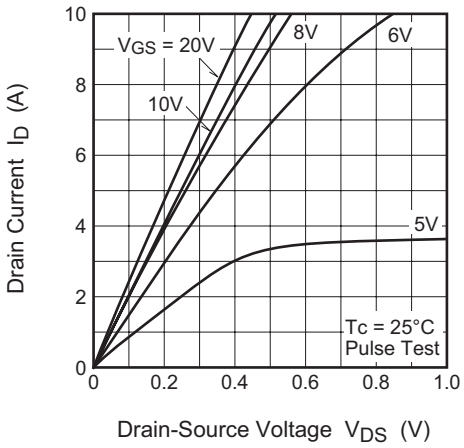
Maximum Safe Operating Area



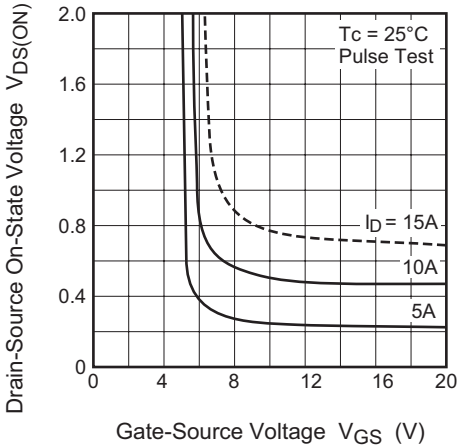
Output Characteristics (Typical)



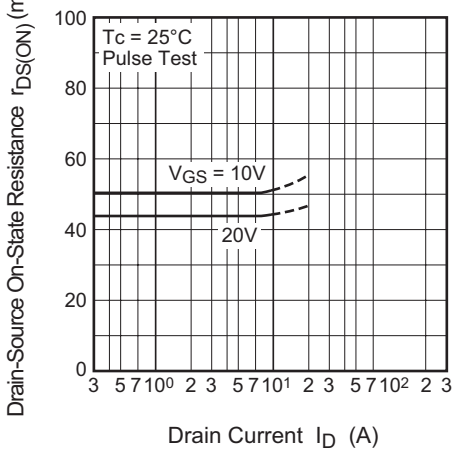
Output Characteristics (Typical)



On-State Voltage vs. Gate-Source Voltage (Typical)



On-State Resistance vs. Drain Current (Typical)



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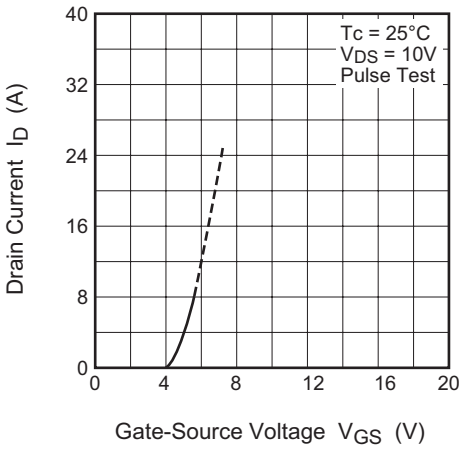
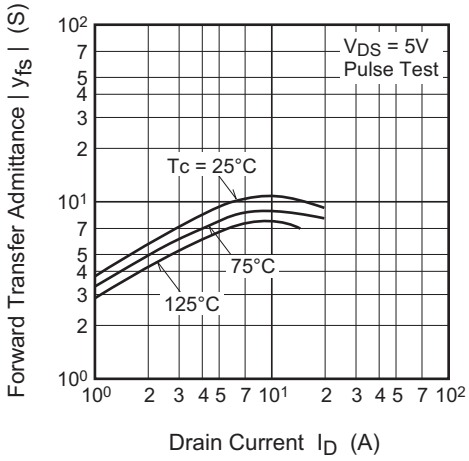
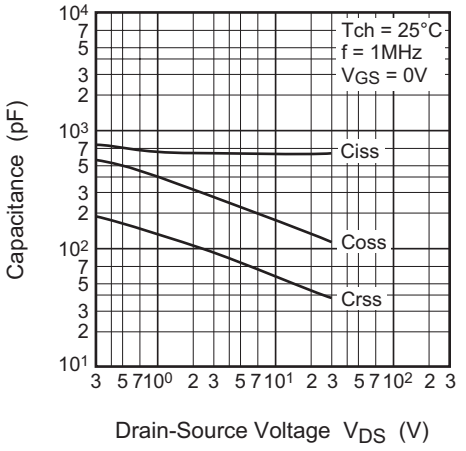
Transfer Characteristics (Typical)



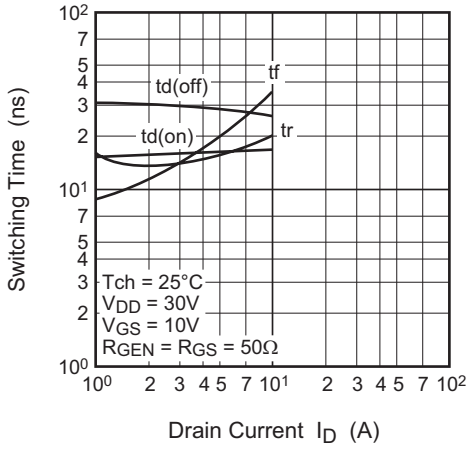
Forward Transfer Admittance vs. Drain Current (Typical)



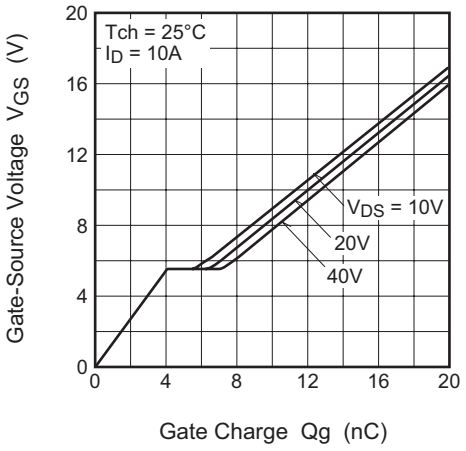
Capacitance vs. Drain-Source Voltage (Typical)



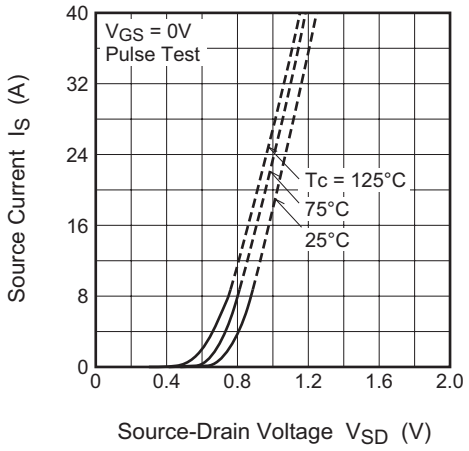
Switching Characteristics (Typical)



Gate-Source Voltage vs. Gate Charge (Typical)



Source-Drain Diode Forward Characteristics (Typical)



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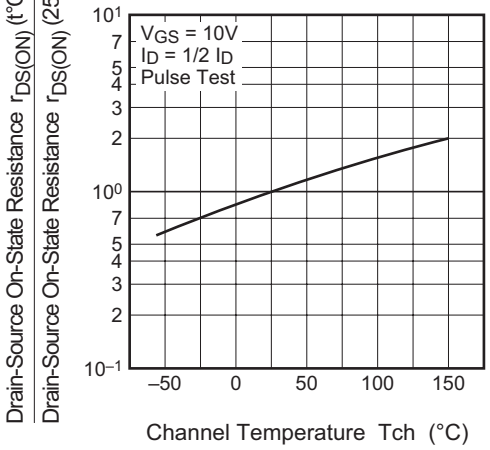
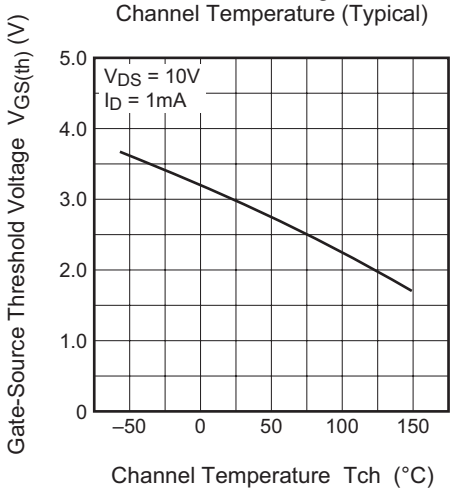
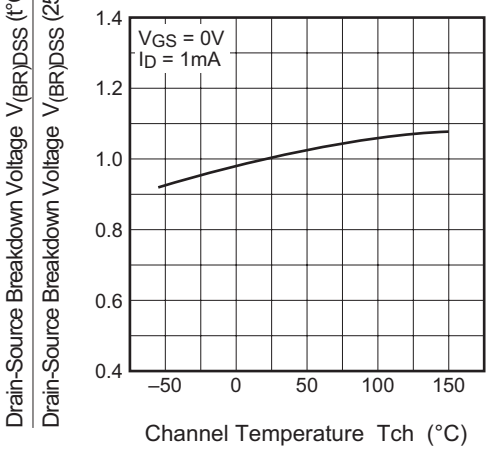
On-State Resistance vs. Channel Temperature (Typical)



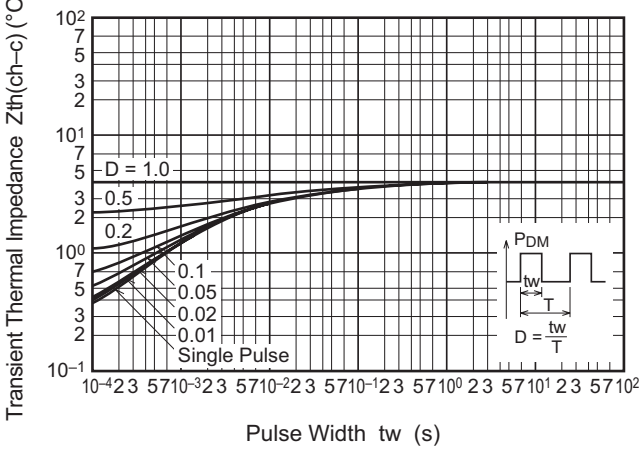
Threshold Voltage vs. Channel Temperature (Typical)



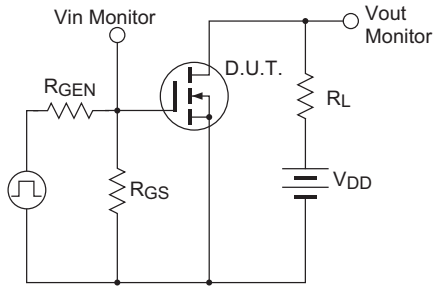
Breakdown Voltage vs. Channel Temperature (Typical)



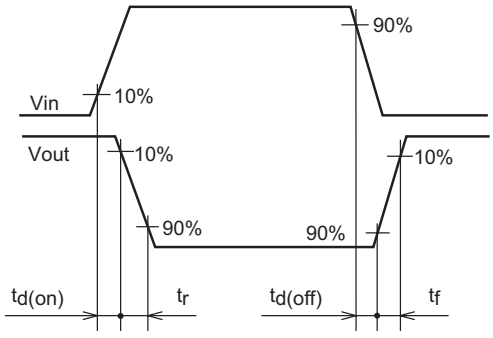
Transient Thermal Impedance Characteristics



Switching Time Measurement Circuit



Switching Waveform



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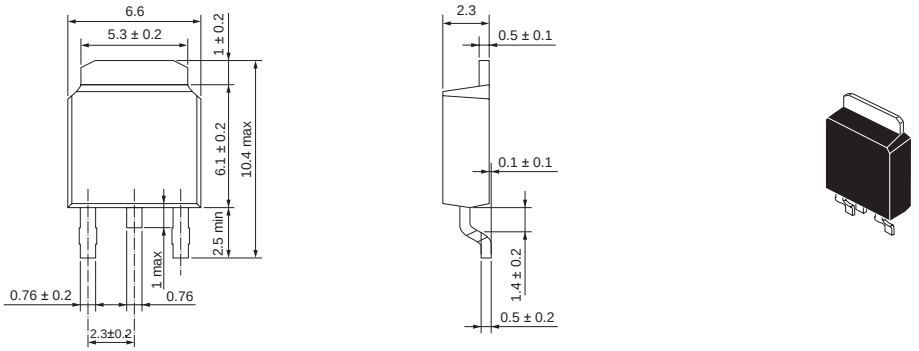
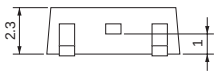
Package Dimensions

MP-3A

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
—	—	0.32	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	FS10AS-06-T13
Surface-mounted type	Plastic Magazine (Tube)	75	Type name	FS10AS-06

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

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