

# FS10AS-06

High-Speed Switching Use  
Nch Power MOS FET

REJ03G0240-0100

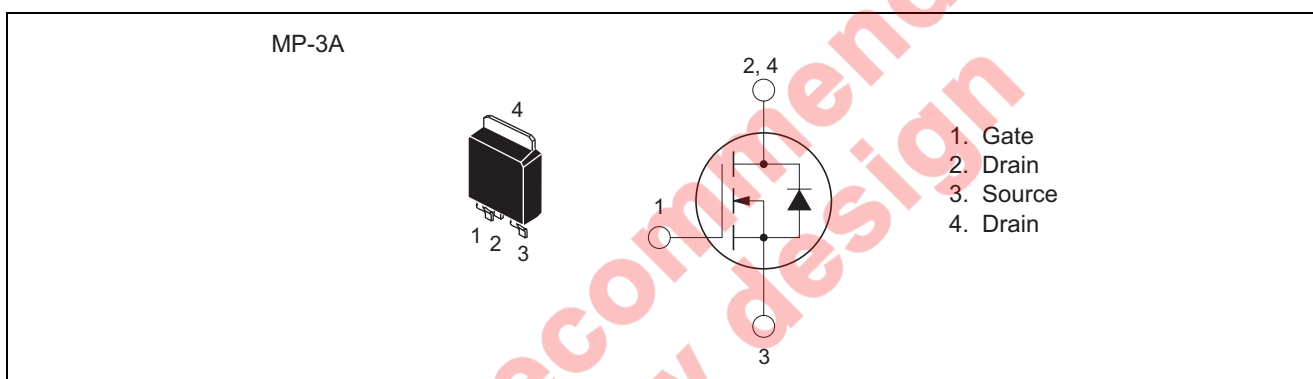
Rev.1.00

Aug.20.2004

## Features

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

## Outline



## Applications

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

## Maximum Ratings

(T<sub>c</sub> = 25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	$V_{DSS}$	60	V	$V_{GS} = 0$ V
Gate-source voltage	$V_{GSS}$	$\pm 20$	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 $\mu$ H
Source current	$I_S$	10	A	
Source current (Pulsed)	$I_{SM}$	40	A	
Maximum power dissipation	$P_D$	30	W	
Channel temperature	T <sub>ch</sub>	- 55 to +150	°C	
Storage temperature	T <sub>stg</sub>	- 55 to +150	°C	
Mass	—	0.32	g	Typical value

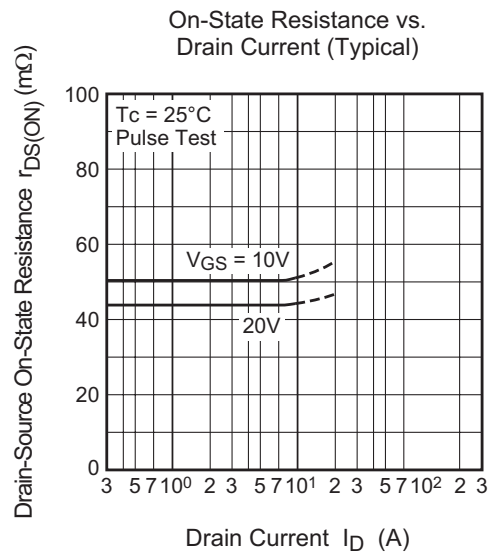
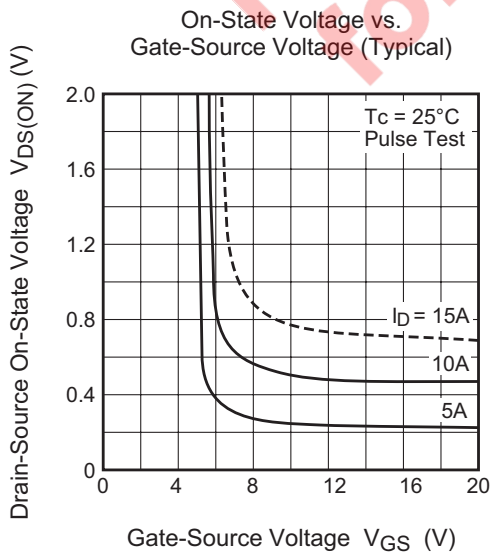
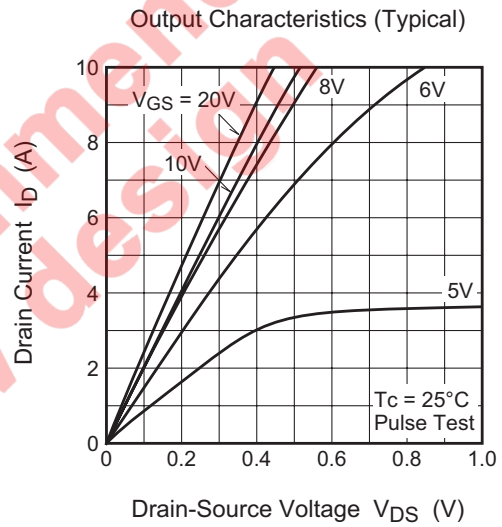
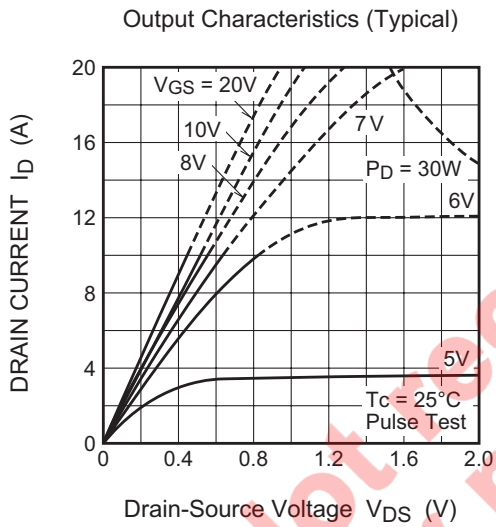
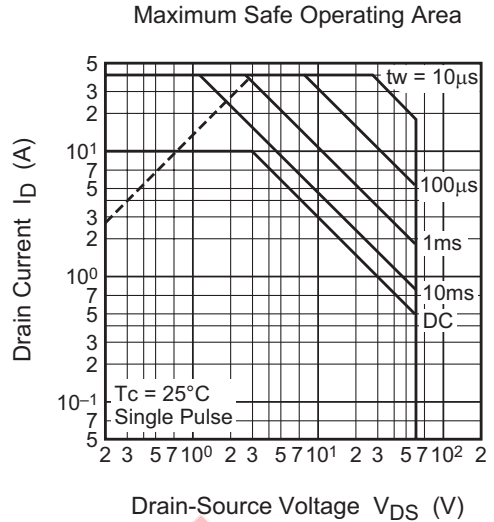
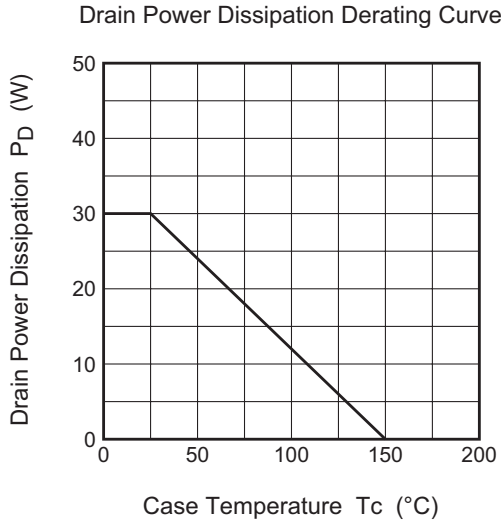
## Electrical Characteristics

(T<sub>ch</sub> = 25°C)

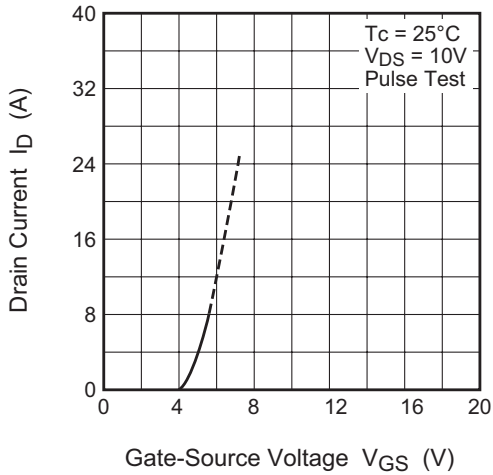
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 1 \text{ mA}$ , $V_{GS} = 0 \text{ V}$
Gate-source leakage current	$I_{GSS}$	—	—	±0.1	μA	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$
Drain-source leakage current	$I_{DSS}$	—	—	0.1	mA	$V_{DS} = 60 \text{ V}$ , $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	58	78	mΩ	$I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.29	0.39	mV	$I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	9.0	—	S	$I_D = 5 \text{ A}$ , $V_{DS} = 5 \text{ V}$
Input capacitance	$C_{iss}$	—	600	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	180	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	60	—	pF	
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	$V_{DD} = 30 \text{ V}$ , $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_{GEN} = R_{GS} = 50 \Omega$
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	$I_S = 5 \text{ A}$ , $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	4.17	°C/W	Channel to case
Reverse recovery time	$t_{rr}$	—	55	—	ns	$I_S = 10 \text{ A}$ , $dis/dt = -100 \text{ A}/\mu\text{s}$

Not recommended  
for new designs

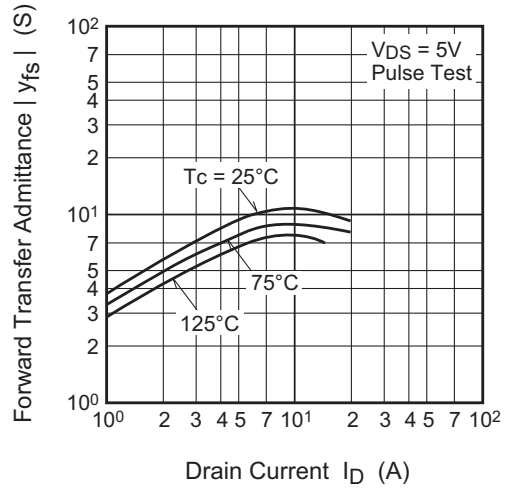
Performance Curves



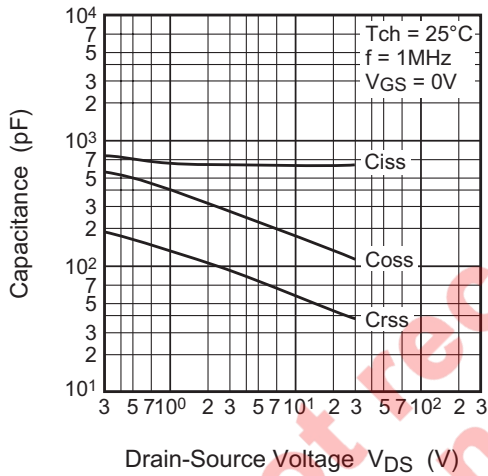
Transfer Characteristics (Typical)



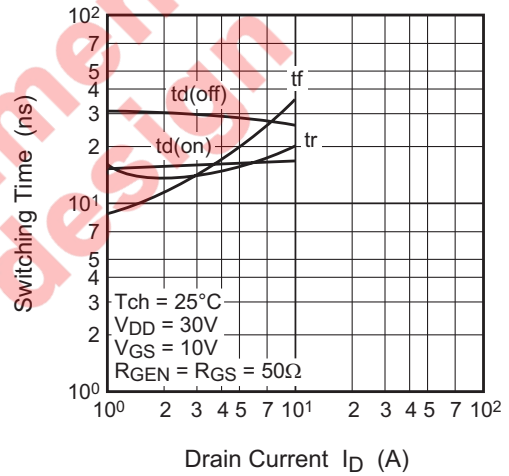
Forward Transfer Admittance vs. Drain Current (Typical)



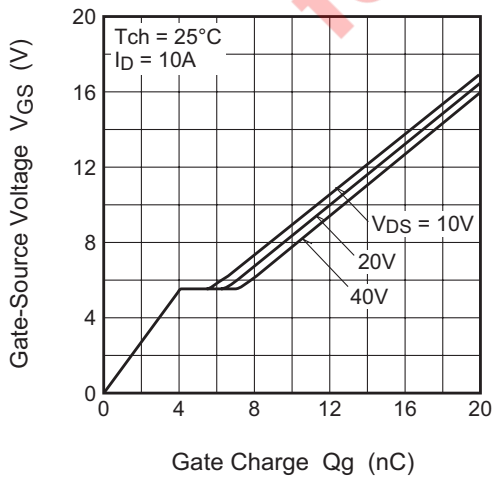
Capacitance vs. Drain-Source Voltage (Typical)



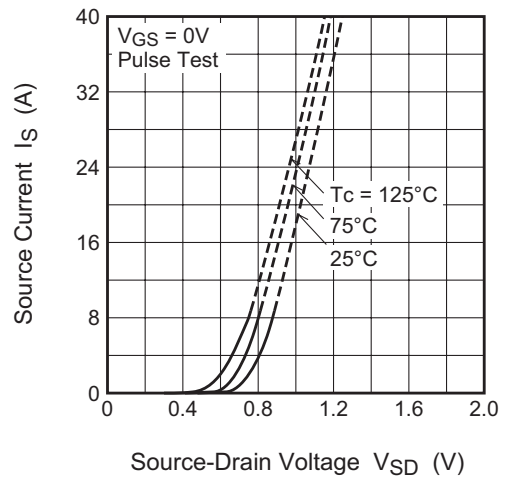
Switching Characteristics (Typical)

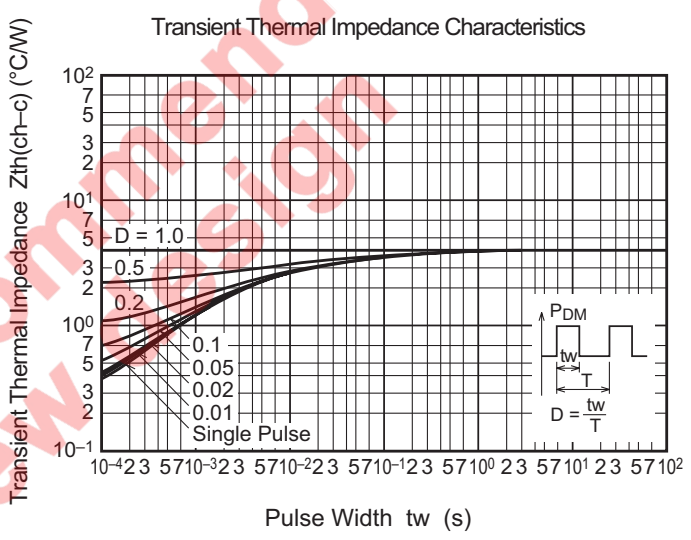
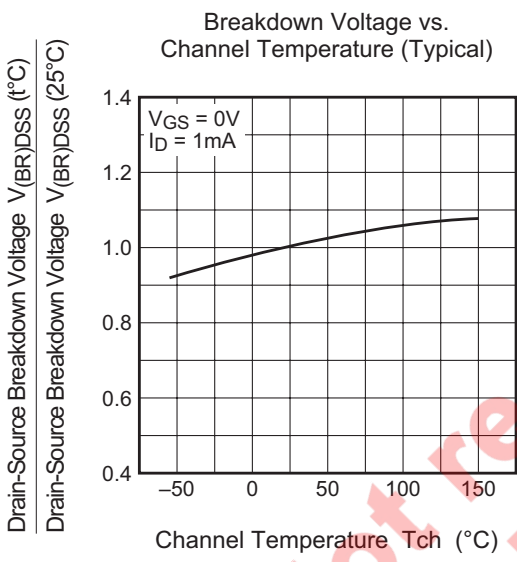
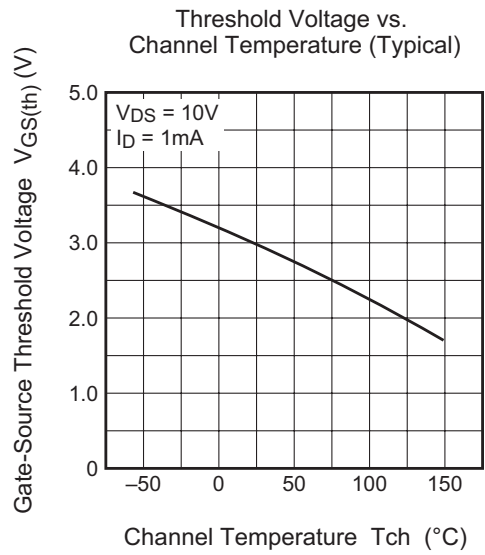
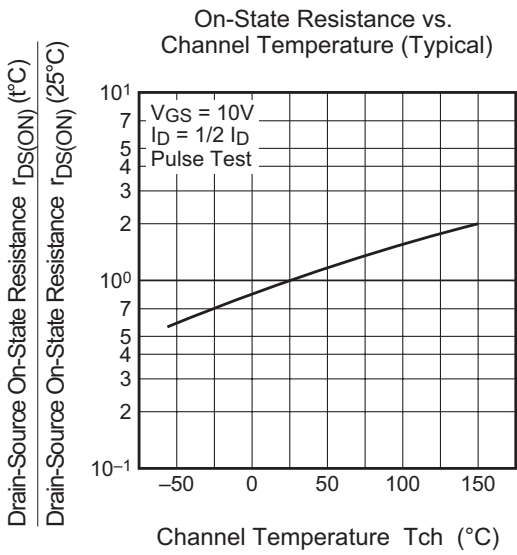


Gate-Source Voltage vs. Gate Charge (Typical)

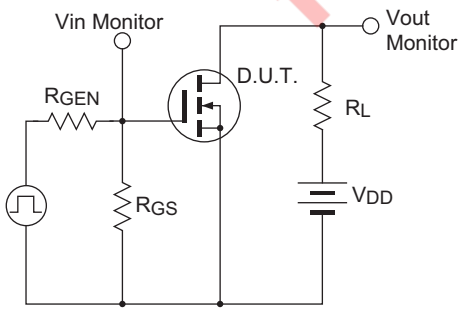


Source-Drain Diode Forward Characteristics (Typical)

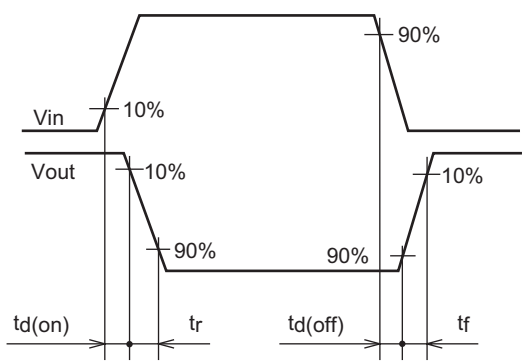




Switching Time Measurement Circuit



Switching Waveform



## Package Dimensions

**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 <sub>1</sub>	—	—	—
A <sub>2</sub>	—	—	—
b	—	—	—
D	—	—	—
E	—	—	—
e	—	—	—
x	—	—	—
y	—	—	—
y <sub>1</sub>	—	—	—
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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