

FS20KM-6A

High-Speed Switching Use
Nch Power MOS FET

REJ03G0258-0100

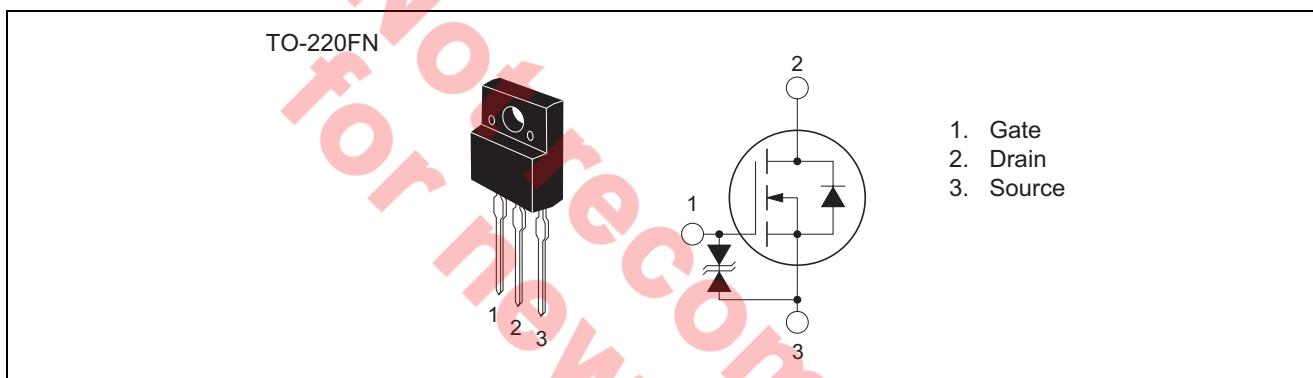
Rev.1.00

Aug.20.2004

Features

- Drive voltage : 10 V
- V_{DSS} : 300 V
- $r_{DS(ON)(max)}$: 0.26 Ω
- I_D : 20 A

Outline



Applications

PDP, lamp ballast, DC-DC converters

Maximum Ratings

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

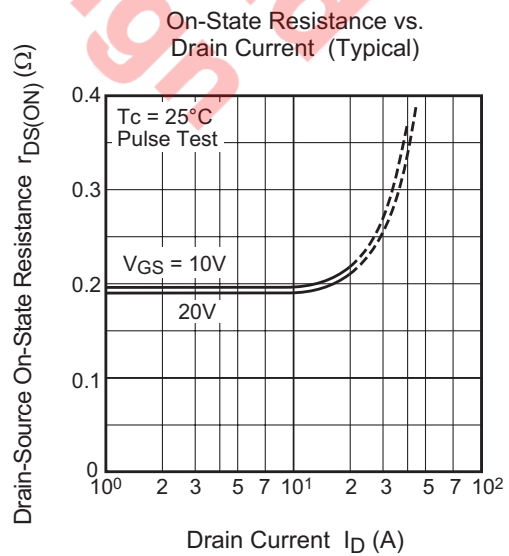
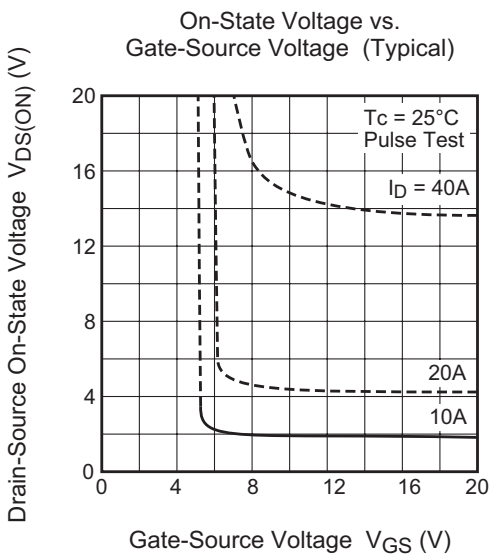
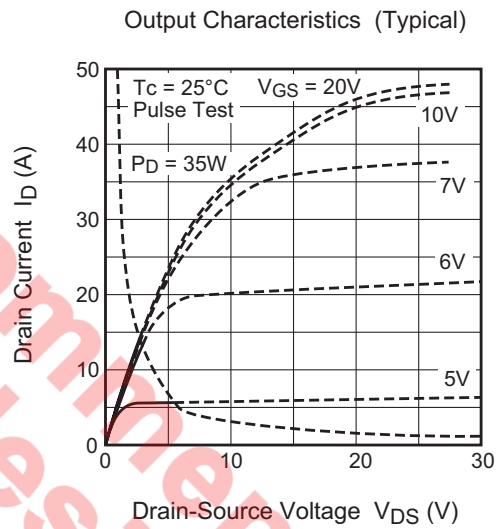
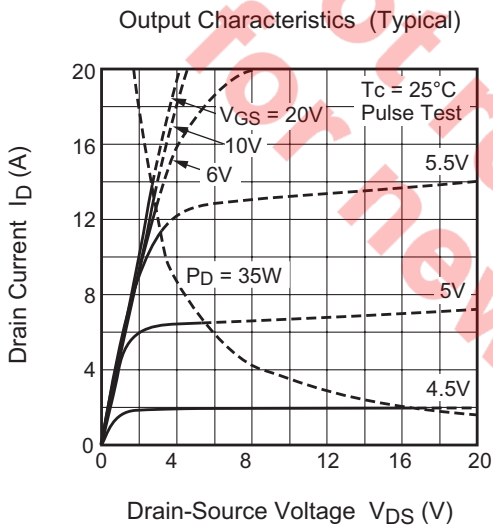
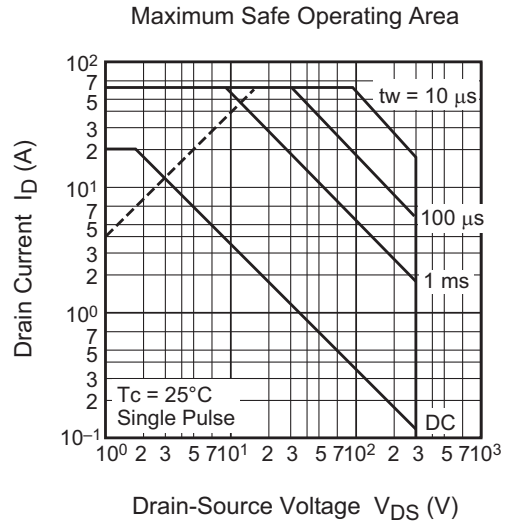
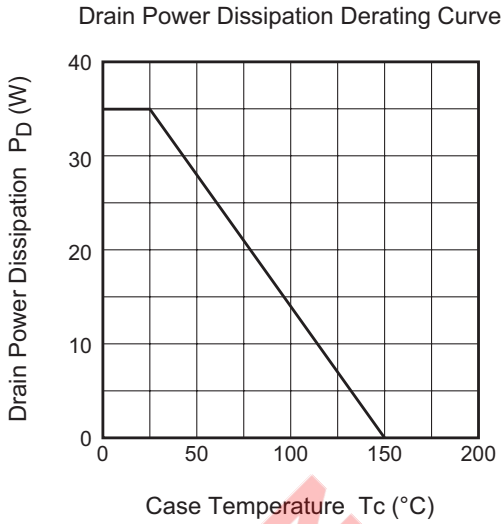
Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	300	V	$V_{GS} = 0\text{ V}$
Gate-source voltage	V_{GSS}	± 30	V	$V_{DS} = 0\text{ V}$
Drain current	I_D	20	A	
Drain current (Pulsed)	I_{DM}	60	A	
Avalanche current (Pulsed)	I_{DA}	20	A	$L = 200\ \mu\text{H}$
Maximum power dissipation	P_D	35	W	
Channel temperature	T_{ch}	- 55 to +150	$^\circ\text{C}$	
Storage temperature	T_{stg}	- 55 to +150	$^\circ\text{C}$	
Mass	—	2.0	g	Typical value
Isolation voltage	V_{iso}	2000	V _{rms}	AC 1 minute, Terminal to case

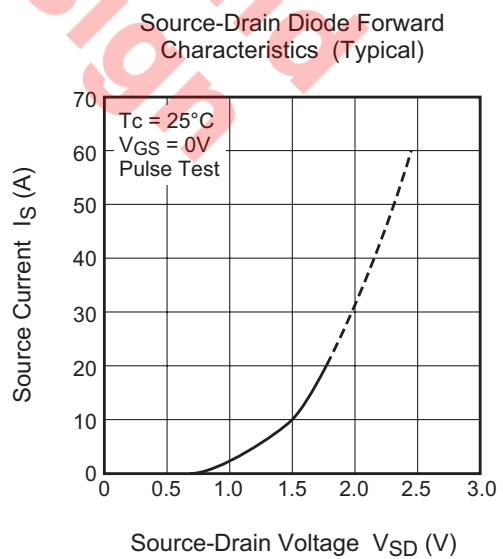
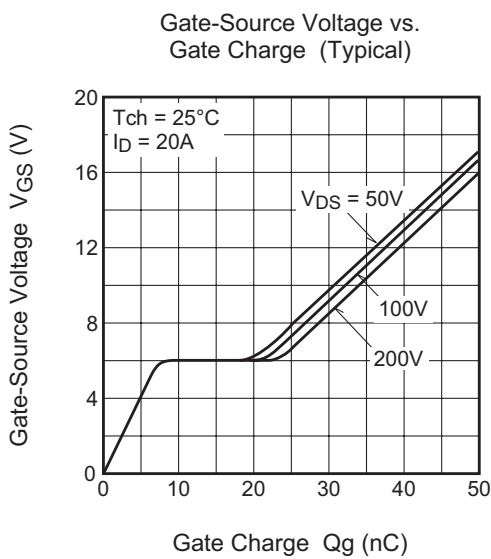
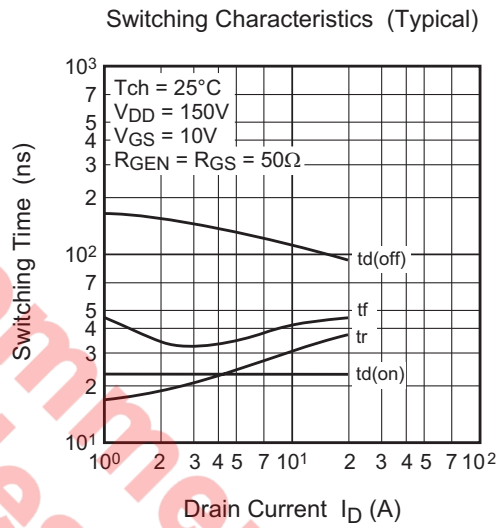
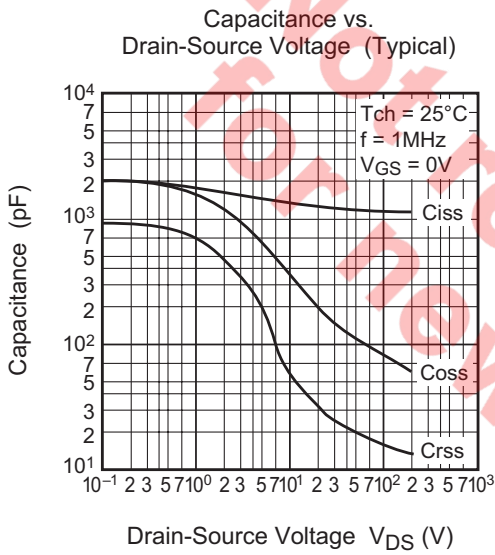
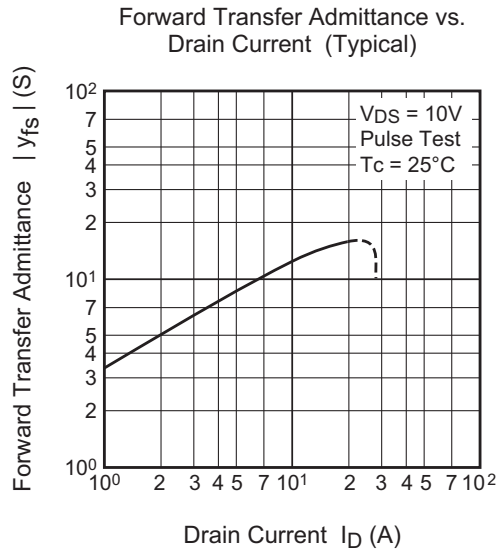
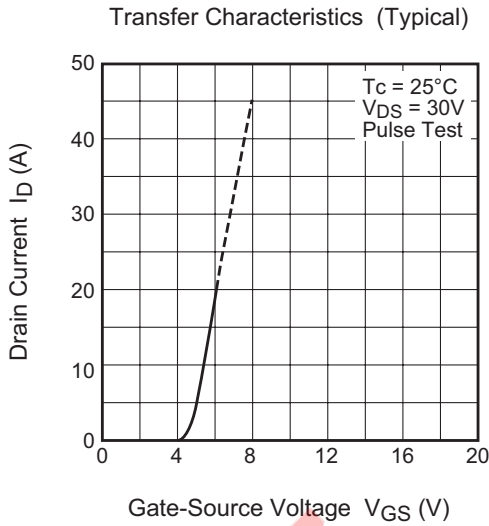
Electrical Characteristics

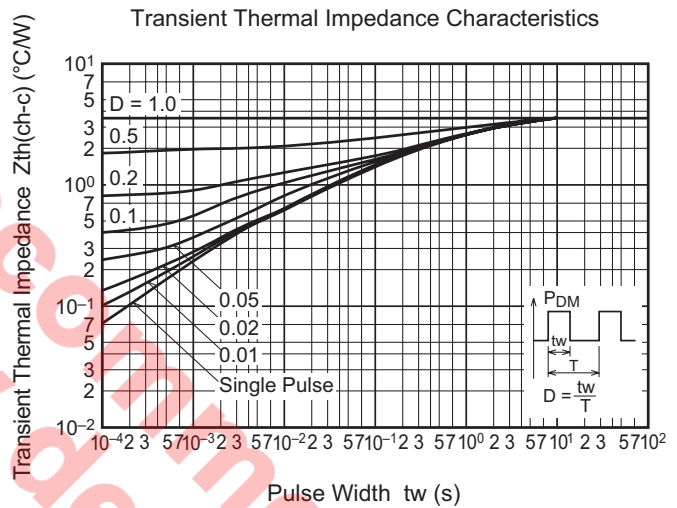
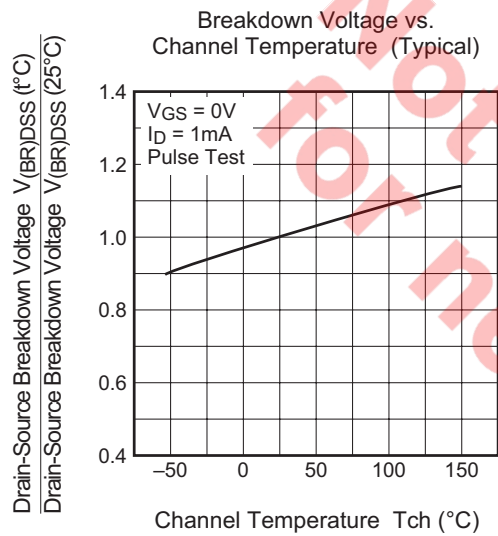
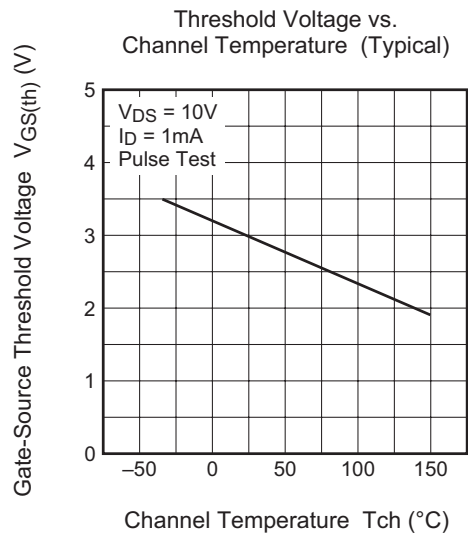
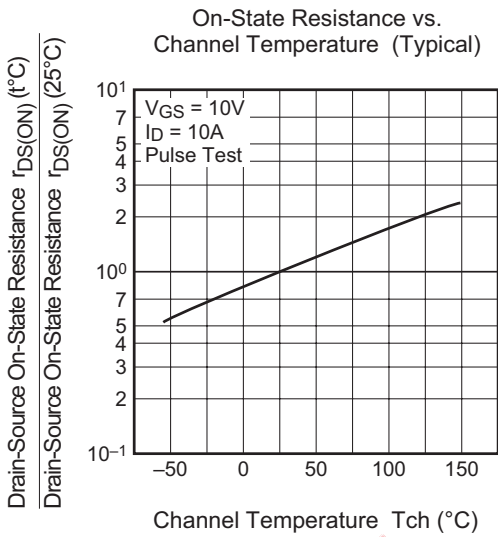
(Tch = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	300	—	—	V	$I_D = 1 \text{ mA}$, $V_{GS} = 0 \text{ V}$
Gate-source breakdown voltage	$V_{(BR)GSS}$	± 30	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0 \text{ V}$
Gate-source leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0 \text{ V}$
Drain-source leakage current	I_{DSS}	—	—	1	mA	$V_{DS} = 300 \text{ V}$, $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	2.5	3.0	3.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	0.20	0.26	Ω	$I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	2.0	2.6	V	$I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	8.5	12	—	S	$I_D = 10 \text{ A}$, $V_{DS} = 10 \text{ V}$
Input capacitance	C_{iss}	—	1300	—	pF	$V_{DS} = 25 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	160	—	pF	
Reverse transfer capacitance	C_{rss}	—	25	—	pF	
Turn-on delay time	$t_{d(on)}$	—	22	—	ns	$V_{DD} = 150 \text{ V}$, $I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \text{ }\Omega$
Rise time	t_r	—	35	—	ns	
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	
Fall time	t_f	—	45	—	ns	
Source-drain voltage	V_{SD}	—	1.5	2.0	V	$I_S = 10 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	3.57	$^{\circ}\text{C/W}$	Channel to case

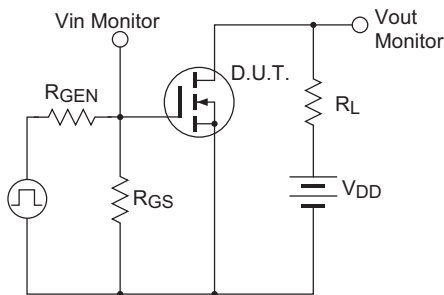
Performance Curves



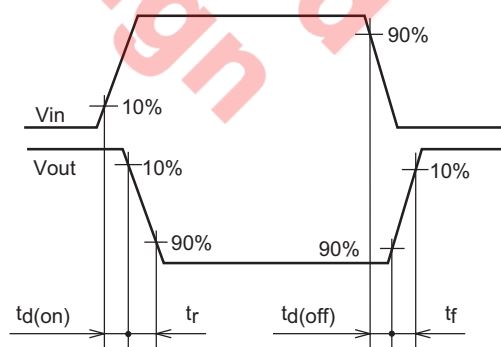




Switching Time Measurement Circuit



Switching Waveform



Package Dimensions

TO-220FN

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
—	—	2.0	Cu alloy

Technical drawings showing dimensions for the TO-220FN package. Dimensions include: 10 ± 0.3, 3 ± 0.3, 15 ± 0.3, 6.5 ± 0.3, φ 3.2 ± 0.2, 14 ± 0.5, 3.6 ± 0.3, 1.1 ± 0.2, 0.75 ± 0.15, 2.54 ± 0.25, 2.8 ± 0.2, 0.75 ± 0.15, 4.5 ± 0.2, and 2.6 ± 0.2.

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

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

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FS20KM-6A
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS20KM-6A-A8

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

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