

# FS7VS-12A

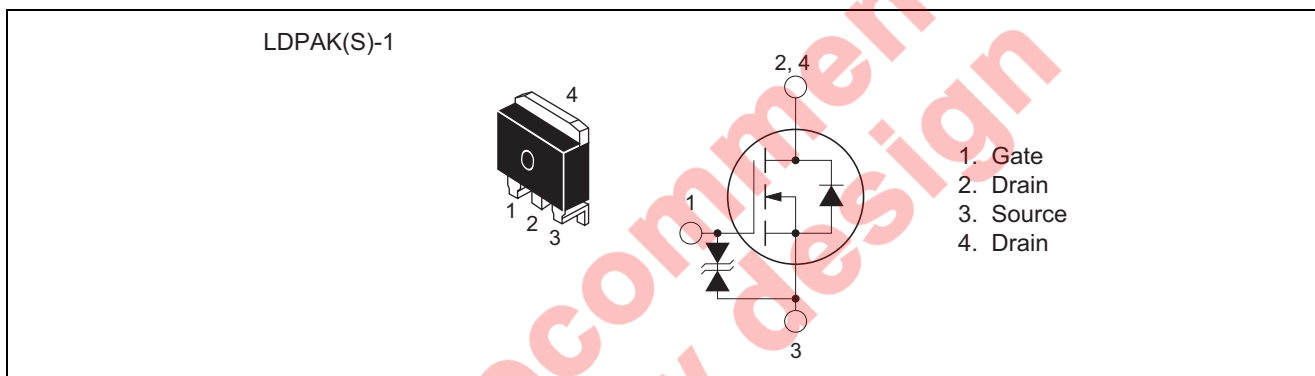
High-Speed Switching Use  
Nch Power MOS FET

REJ03G0271-0100  
Under development  
Rev.1.00  
Aug.20.2004

## Features

- Drive voltage : 10 V
- $V_{DSS}$  : 600 V
- $r_{DS(ON)(max)}$  : 1.3  $\Omega$
- $I_D$  : 7 A

## Outline



## Applications

SMPS, lamp ballast, etc.

## Maximum Ratings

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

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	$V_{DSS}$	600	V	$V_{GS} = 0\text{ V}$
Gate-source voltage	$V_{GSS}$	$\pm 30$	V	$V_{DS} = 0\text{ V}$
Drain current	$I_D$	7	A	
Drain current (Pulsed)	$I_{DM}$	21	A	
Avalanche current (Pulsed)	$I_{DA}$	7	A	$L = 200\ \mu\text{H}$
Maximum power dissipation	$P_D$	100	W	
Channel temperature	$T_{ch}$	- 55 to +150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	- 55 to +150	$^\circ\text{C}$	
Mass	—	1.2	g	Typical value

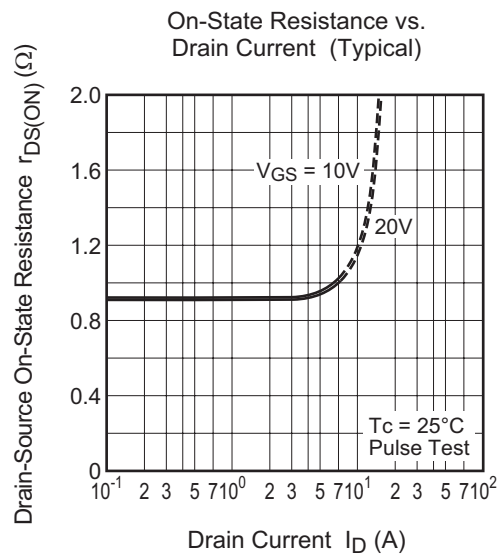
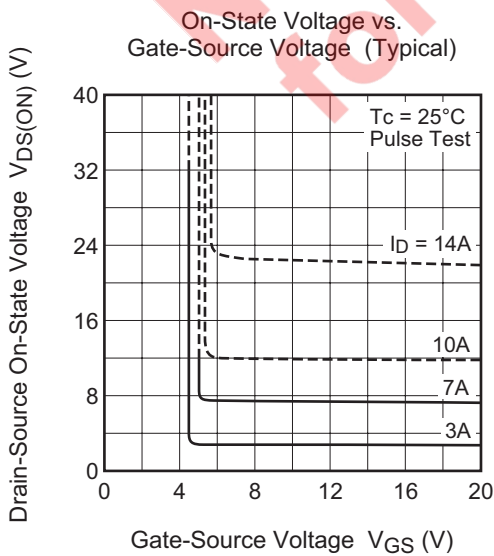
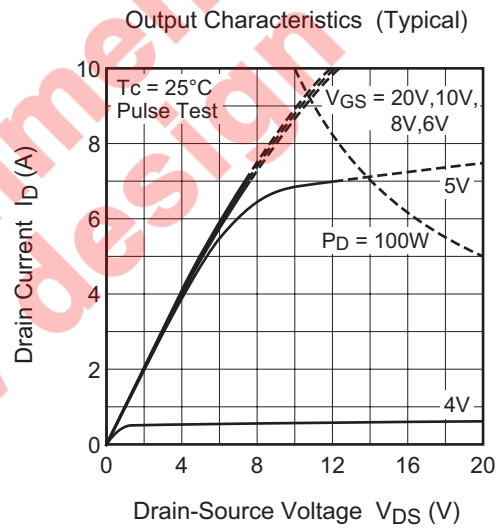
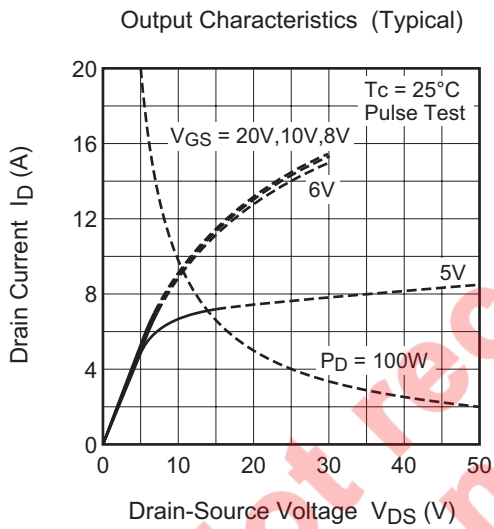
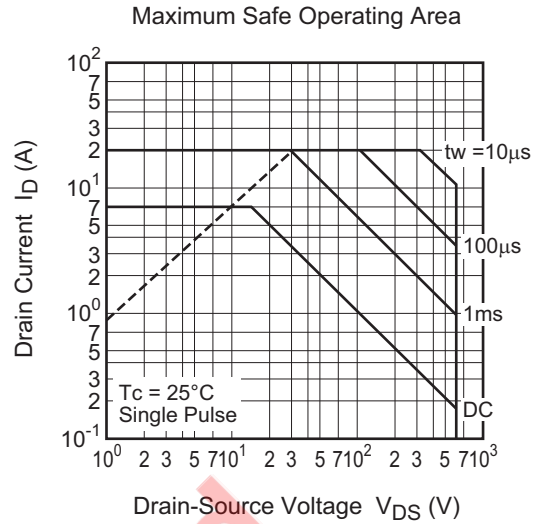
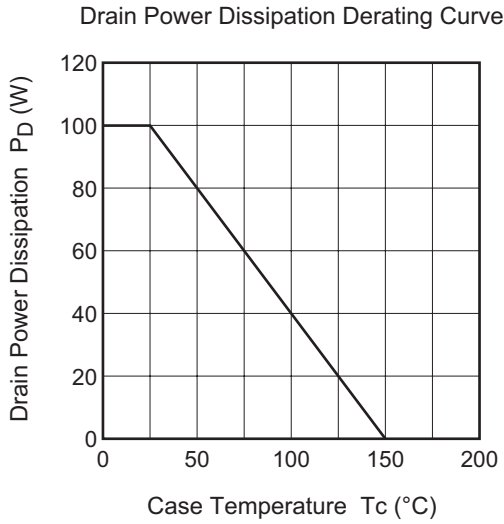
## Electrical Characteristics

(T<sub>ch</sub> = 25°C)

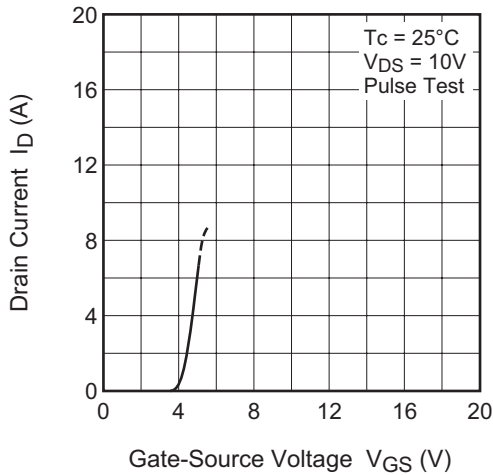
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	600	—	—	V	I <sub>D</sub> = 1 mA, V <sub>GS</sub> = 0 V
Gate-source breakdown voltage	V <sub>(BR)GSS</sub>	±30	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0 V
Gate-source leakage current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±25 V, V <sub>DS</sub> = 0 V
Drain-source leakage current	I <sub>DSS</sub>	—	—	1	mA	V <sub>DS</sub> = 600 V, V <sub>GS</sub> = 0 V
Gate-source threshold voltage	V <sub>GS(th)</sub>	2.5	3.0	3.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Drain-source on-state resistance	r <sub>DS(ON)</sub>	—	1.0	1.3	Ω	I <sub>D</sub> = 3 A, V <sub>GS</sub> = 10 V
Drain-source on-state voltage	V <sub>DS(ON)</sub>	—	3.0	3.9	V	I <sub>D</sub> = 3 A, V <sub>GS</sub> = 10 V
Forward transfer admittance	y <sub>fs</sub>	4.2	7.0	—	S	I <sub>D</sub> = 3 A, V <sub>DS</sub> = 10 V
Input capacitance	C <sub>iss</sub>	—	1100	—	pF	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 10 V, f = 1MHz
Output capacitance	C <sub>oss</sub>	—	100	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	25	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	20	—	ns	V <sub>DD</sub> = 200 V, I <sub>D</sub> = 3 A, V <sub>GS</sub> = 10 V, R <sub>GEN</sub> = R <sub>GS</sub> = 50 Ω
Rise time	t <sub>r</sub>	—	25	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	150	—	ns	
Fall time	t <sub>f</sub>	—	35	—	ns	
Source-drain voltage	V <sub>SD</sub>	—	1.5	2.0	V	I <sub>S</sub> = 3 A, V <sub>GS</sub> = 0 V
Thermal resistance	R <sub>th(ch-c)</sub>	—	—	1.25	°C/W	Channel to case

Not recommended  
for new designs

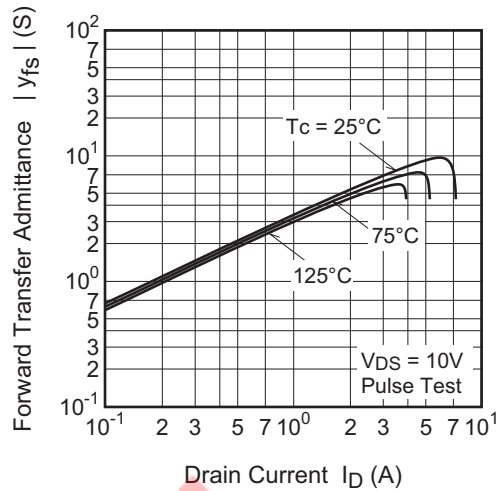
Performance Curves



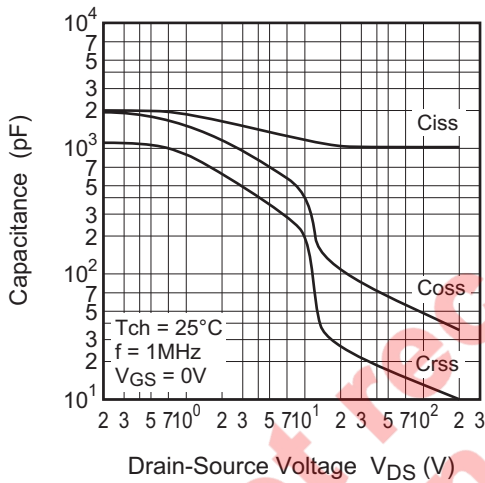
Transfer Characteristics (Typical)



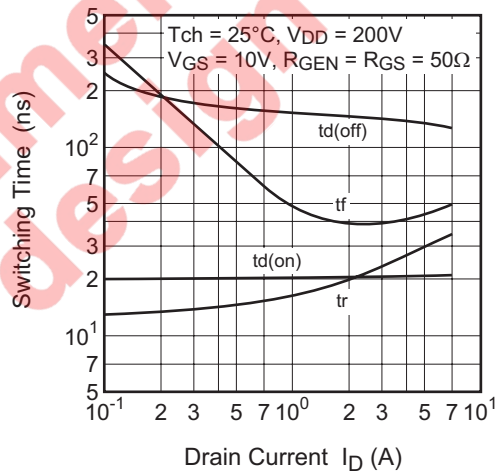
Forward Transfer Admittance vs. Drain Current (Typical)



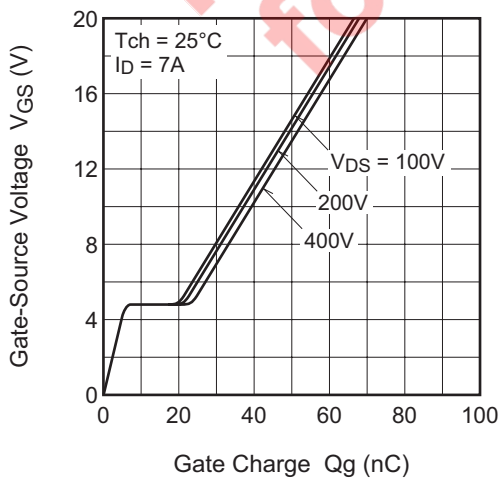
Capacitance vs. Drain-Source Voltage (Typical)



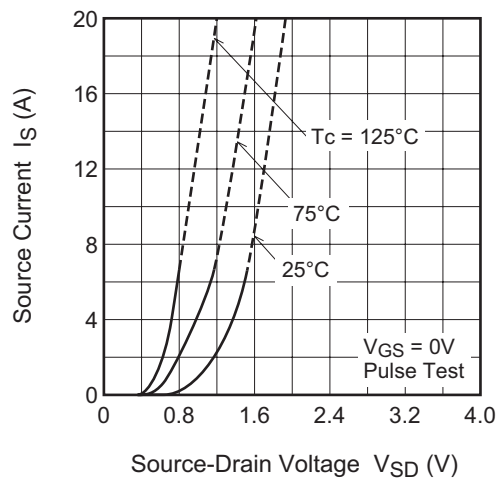
Switching Characteristics (Typical)

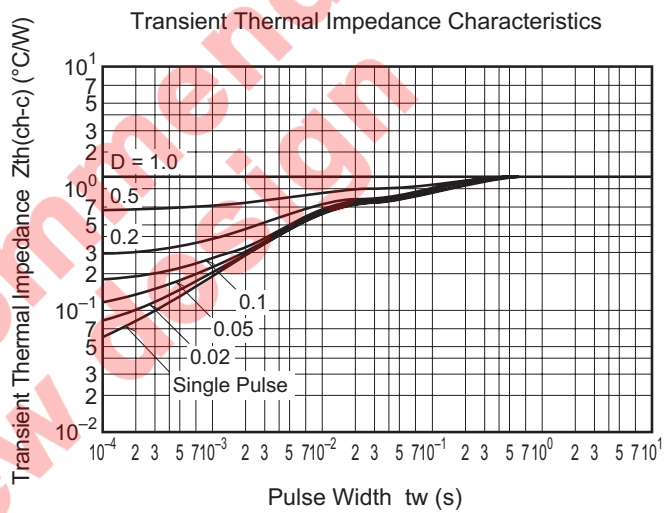
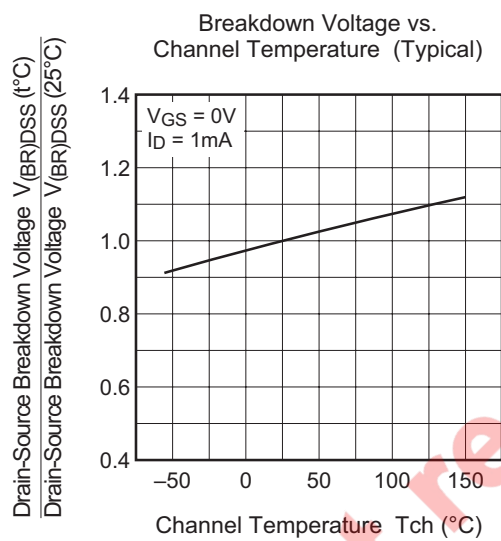
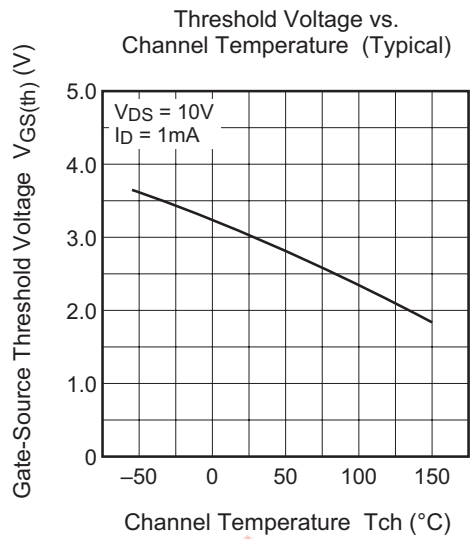
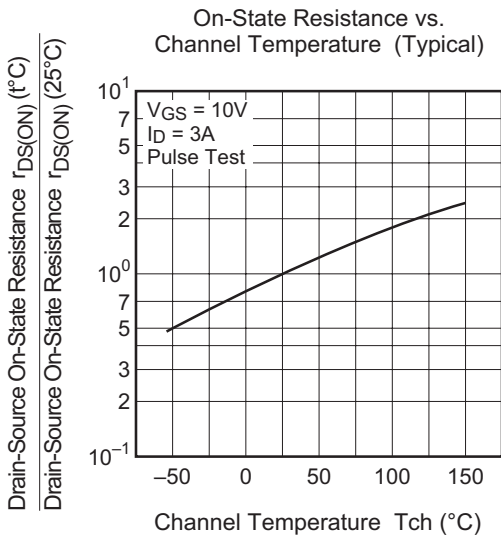


Gate-Source Voltage vs. Gate Charge (Typical)

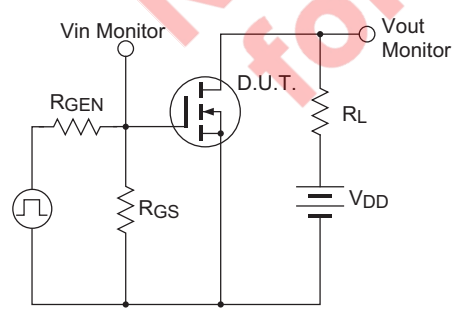


Source-Drain Diode Forward Characteristics (Typical)

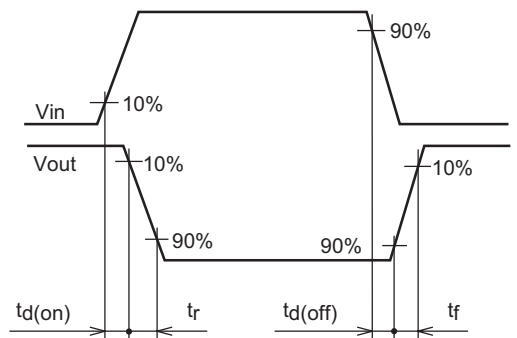




Switching Time Measurement Circuit

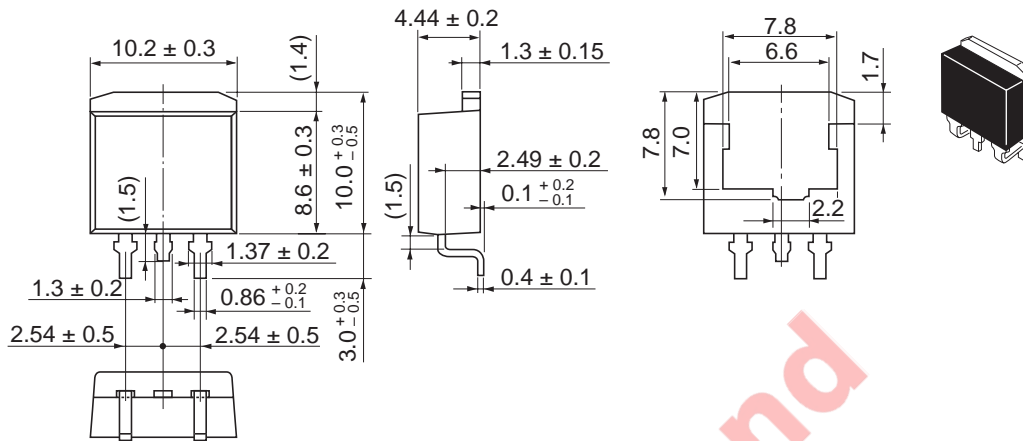


Switching Waveform



Package Dimensions

As of January, 2003  
Unit: mm



Package Code	LDBAK (S)-(1)
JEDEC	—
JEITA	—
Mass (reference value)	1.30 g

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Surface-mounted type	Taping	1000	Type name – T +Direction (1 or 2) +1	FS7VS-12A-T11

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

Not recommended for new design

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