

FMV23N50ES

FUJI POWER MOSFET

Super FAP-E^{3S} series

N-CHANNEL SILICON POWER MOSFET

■ Features

Maintains both low power loss and low noise Lower R_{DS}(on) characteristic More controllable switching dv/dt by gate resistance Smaller V_{GS} ringing waveform during switching Narrow band of the gate threshold voltage (4.2±0.5V) High avalanche durability

Applications

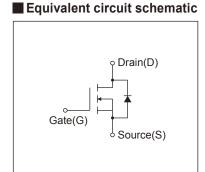
Switching regulators UPS (Uninterruptible Power Supply) DC-DC converters

Maximum Ratings and Characteristics

● Absolute Maximum Ratings at Tc=25°C (unless otherwise specified)

TO-220F 10:0.5 (SLS)	4,5±0.2
Lot No.	2
Trodemark Type name See Note:1.	71
	A Laim
1,2 t0.2	Pre-Solder
0,7±0.2	0.5 %3
2,54 ±0.2	2,7#0.2
000	CONNECTION
4 + +	① GATE ② DRAIN ③ SOURCE

■ Outline Drawings [mm]



Description	Symbol	Characteristics	Unit	Remarks
Drain Sauras Valtaria	V _{DS}	500	V	
Drain-Source Voltage	V _{DSX}	500	V	V _{GS} = -30V
Continuous Drain Current	ID	±23	Α	
Pulsed Drain Current	IDP	±92	Α	
Gate-Source Voltage	V _G s	±30	V	
Repetitive and Non-Repetitive Maximum Avalanche Current	Iar	23	Α	Note*1
Non-Repetitive Maximum Avalanche Energy	Eas	767.3	mJ	Note*2
Repetitive Maximum Avalanche Energy	Ear	13	mJ	Note*3
Peak Diode Recovery dV/dt	dV/dt	5.4	kV/μs	Note*4
Peak Diode Recovery -di/dt	-di/dt	100	A/µs	Note*5
Manianana Banna Birainatian	PD	2.16	10/	Ta=25°C
Maximum Power Dissipation		130	W	Tc=25°C
O	Tch	150	°C	
Operating and Storage Temperature range	Tstg	-55 to + 150	°C	
Isolation Voltage	Viso	2	kVrms	t = 60sec, f = 60Hz

● Electrical Characteristics at Tc=25°C (unless otherwise specified)

Description	Symbol	Conditions		min.	typ.	max.	Unit	
Drain-Source Breakdown Voltage	BVDSS	I _D =250μA, V _{GS} =0V		500	-	-	V	
Gate Threshold Voltage	V _{GS} (th)	I _D =250µA, V _{DS} =V _{GS}		3.7	4.2	4.7	V	
Zero Gate Voltage Drain Current		V _{DS} =500V, V _{GS} =0V	T _{ch} =25°C	-	-	25		
	Ipss	V _{DS} =400V, V _{GS} =0V	Γ _{ch} =125°C	-	-	250	μΑ	
Gate-Source Leakage Current	Igss	V _{GS} =±30V, V _{DS} =0V		-	10	100	nA	
Drain-Source On-State Resistance	R _{DS} (on)	I _D =11.5A, V _{GS} =10V		-	0.209	0.245	Ω	
Forward Transconductance	g _{fs}	I _D =11.5A, V _{DS} =25V		8.5	17	-	S	
Input Capacitance	Ciss	V _{DS} =25V		-	2700	4050	pF	
Output Capacitance	Coss	V _{GS} =0V	-	330	495			
Reverse Transfer Capacitance	Crss	f=1MHz	-	20	30			
Turn-On Time	td(on)	Vcc=300V		-	42	63	63 54 141 25.5	
Turni-On Time	tr	V _{GS} =10V	V _{GS} =10V I _D =11.5A		36	54		
Turn-Off Time	td(off)	I _D =11.5A			94	141		
Turn-Off Time	tf	R _{GS} =10Ω		-	17	25.5		
Total Gate Charge	Q _G	V 050V			73	109.5		
Gate-Source Charge	Q _{GS}	- V _∞ =250V - I _D =23A - V _{GS} =10V		-	24	36	nC	
Gate-Drain Charge	Q _{GD}			-	27	40.5	IIC .	
Gate-Drain Crossover Charge	Qsw			-	10	15		
Avalanche Capability	lav	L=1.16mH, Tch=25°C	L=1.16mH, T _{ch} =25°C		-	-	А	
Diode Forward On-Voltage	VsD	I _F =23A, V _{GS} =0V, T _{ch} =25°C		-	0.90	1.35	V	
Reverse Recovery Time	trr	I _F =23A, V _{GS} =0V	I _F =23A, V _{GS} =0V		0.5	-	μs	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25°C	-di/dt=100A/μs, Tch=25°C		8.0	-	μC	

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			0.960	°C/W
	Rth (ch-a)	Channel to Ambient			58.0	°C/W

Note *1 : Tch≤150°C.

Note '2: Stating Tch=25°C, I_{AS}=10A, L=14.1mH, Vcc=50V, R_G=50Ω.

Eas limited by maximum channel temperature and avalanche current.

See to 'Avalanche Energy' graph.

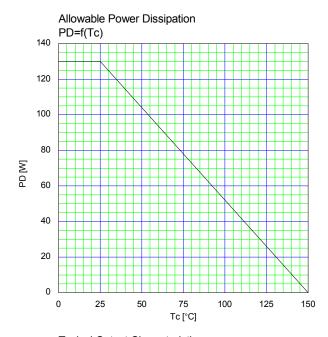
Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

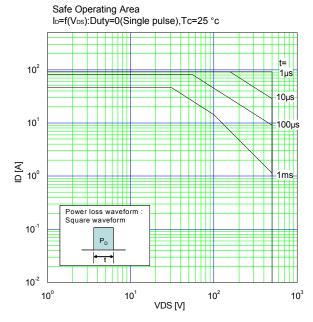
See to the 'Transient Themal impeadance' graph.

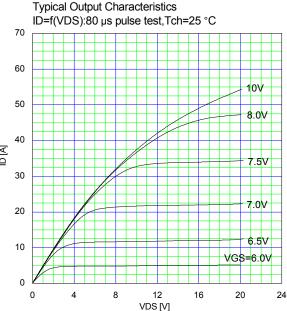
Note *4 : Ir≤-Iɒ, -di/dt=100A/µs, Vcc≤BVbss, Tch≤150°C.

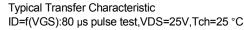
Note *5 : Ir≤-Iɒ, dv/dt=5.4kV/µs, Vcc≤BVbss, Tch≤150°C.

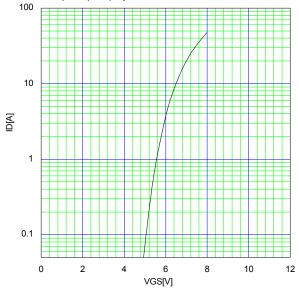
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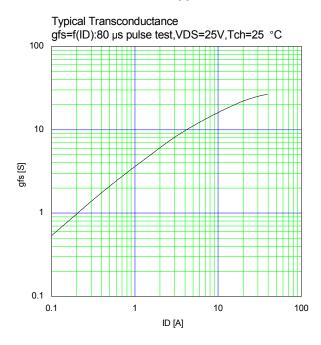


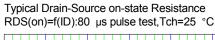


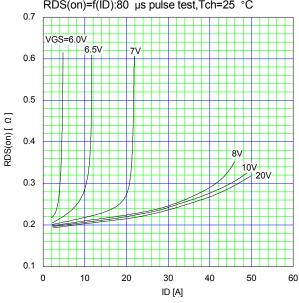




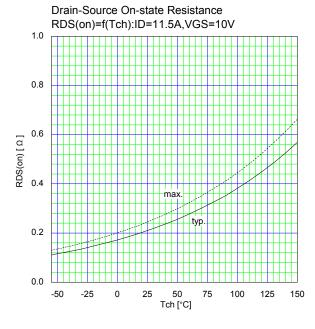


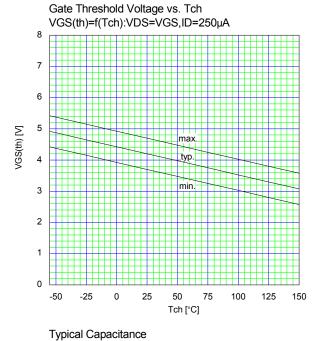


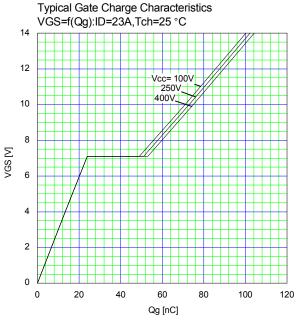


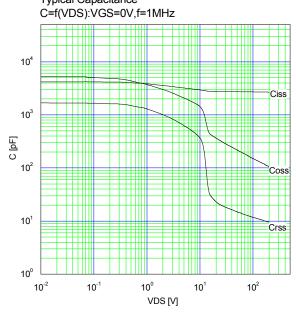


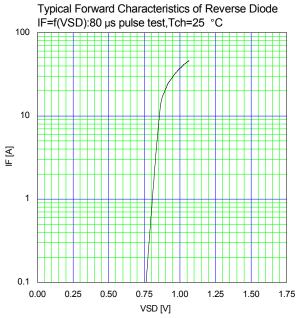
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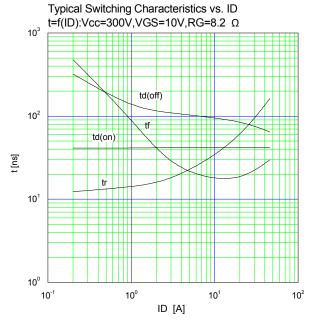


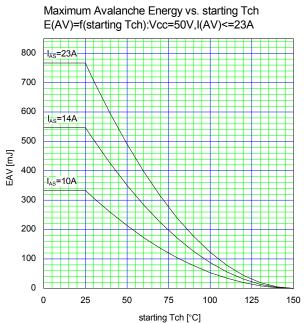


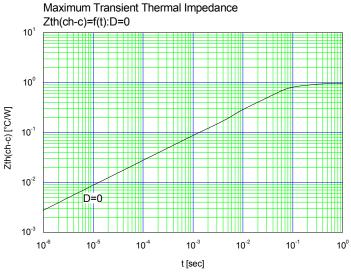












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