

FMV21N50ES

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

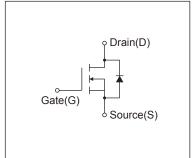
Maximum Ratings and Characteristics

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

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TO-220F (SLS) Lot No. Trademrit Jupa nome See Note:1. 2.54 a.2 2.54 a.2 2.54 a.2 2.54 a.2	2.7 st.2 2.7 st.2 Pre-Solder 0.5 94 2.7 st.2
①②③	CONNECTION ① GATE ② DRAIN ③ SOURCE

■ Outline Drawings [mm]

■ Equivalent circuit schematic



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	±21	А	
Pulsed Drain Current	IDP	±84	Α	
Gate-Source Voltage	V _G s	±30	V	
Repetitive and Non-Repetitive Maximum Avalanche Current	Iar	21	Α	Note*1
Non-Repetitive Maximum Avalanche Energy	Eas	714.5	mJ	Note*2
Repetitive Maximum Avalanche Energy	Ear	12	mJ	Note*3
Peak Diode Recovery dV/dt	dV/dt	5.7	kV/μs	Note*4
Peak Diode Recovery -di/dt	-di/dt	100	A/µs	Note*5
Maniana Bana Biasiastian	PD	2.16	10/	Ta=25°C
Maximum Power Dissipation		120	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 = 60H;

● 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 _G	ch=25°C	-	-	25		
	IDSS	V _{DS} =400V, V _{GS} =0V T _G	_{ch} =125°C	-	-	250	μA	
Gate-Source Leakage Current	Igss	V _{GS} =±30V, V _{DS} =0V		-	10	100	nA	
Drain-Source On-State Resistance	R _{DS} (on)	I _D =10.5A, V _{GS} =10V		-	0.23	0.27	Ω	
Forward Transconductance	g _{fs}	I _D =10.5A, V _{DS} =25V		7.5	15	-	S	
Input Capacitance	Ciss	V _{DS} =25V V _{GS} =0V f=1MHz		-	2450	3675	pF	
Output Capacitance	Coss			-	320	480		
Reverse Transfer Capacitance	Crss			-	19	28.5		
Turn-On Time	td(on)	$V_{cs} = 300V$ $V_{ds} = 10V$ $I_{D} = 10.5A$ $R_{ds} = 15\Omega$		-	41	61.5	ns	
Turn-On Time	tr			-	33	49.5		
Turn-Off Time	td(off)			-	90	135		
	tf			-	16	24		
Total Gate Charge	Q _G	V _{cc} =250V I _D =21A V _{GS} =10V		-	68	102		
Gate-Source Charge	Q _{GS}			-	23	34.5	nC	
Gate-Drain Charge	Q _{GD}			-	26	39		
Gate-Drain Crossover Charge	Qsw			-	10	15		
Avalanche Capability	lav	L=1.27mH, Tch=25°C		21	-	-	Α	
Diode Forward On-Voltage	V _{SD}	I _F =21A, V _{GS} =0V, T _{ch} =25°C		-	0.90	1.35	V	
Reverse Recovery Time	trr	I _F =21A, V _{GS} =0V		-	0.45	-	μs	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25°C		-	7.2	-	μC	

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			1.040	°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}=9A, L=16.2mH, Vcc=50V, R_G=50Ω.

Eas limited by maximum channel temperature and avalanche current.

See to 'Avalanche Energy' graph.

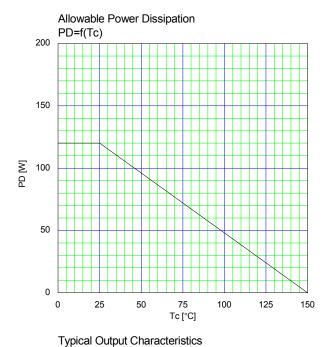
Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

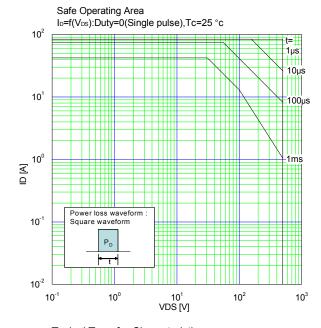
See to the 'Transient Themal impeadance' graph.

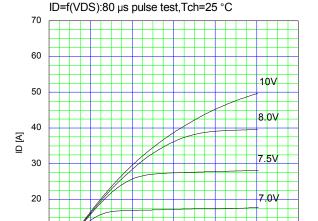
Note *4 : Ir≤-Iɒ, -di/dt=100A/µs, Vcc≤BVbss, Tch≤150°C.

Note *5 : Ir≤-Iɒ, dv/dt=5.7kV/µs, Vcc≤BVbss, Tch≤150°C.

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12

VDS [V]

16

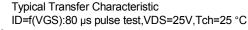
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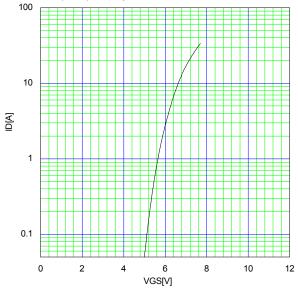
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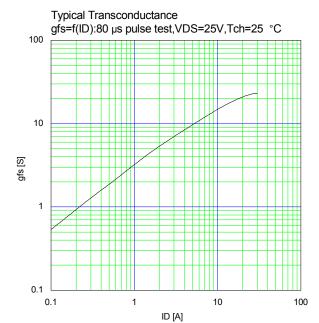
6.5V

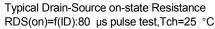
VGS=6.0V

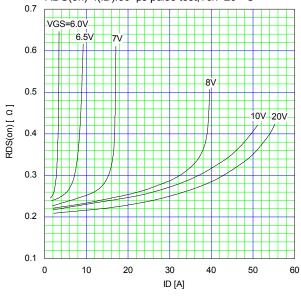
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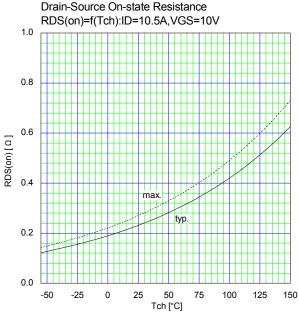


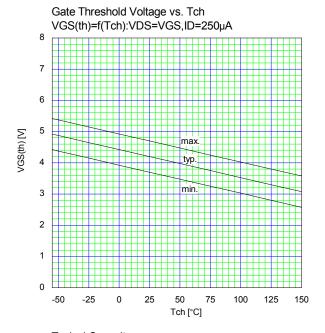


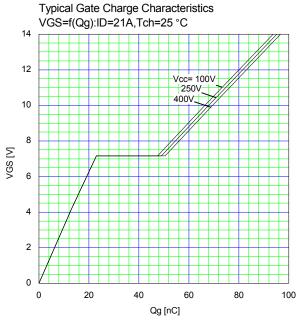


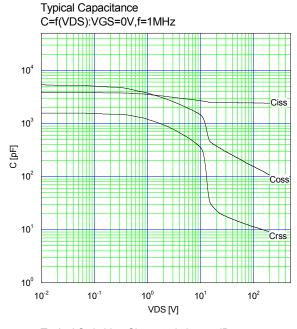


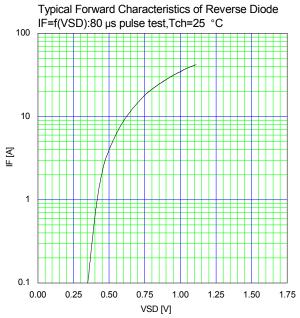
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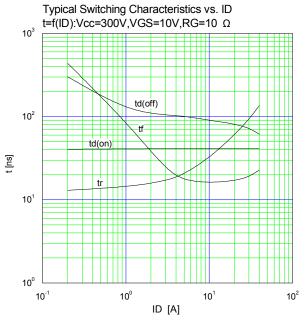


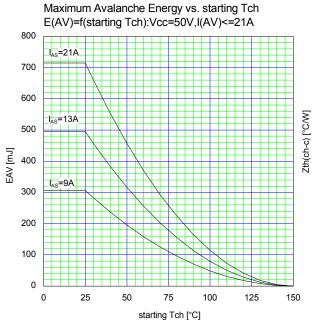


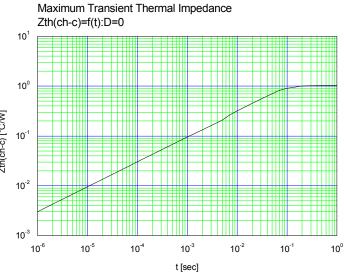












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