

FMH21N50ES

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

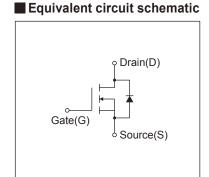
Applications

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

■ Maximum Ratings and Characteristics

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

TO-3P (Q) 15.5m 45.2m. 1.08.1



Description	Symbol	Characteristics	Unit	Remarks	
Proin Course Voltogo	V _{DS}	500	V		
Drain-Source Voltage	V _{DSX}	500	V	V _{GS} = -30V	
Continuous Drain Current	ID	±21	Α		
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	28.5	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	
Maximum Power Dissipation	PD	2.50	10/	Ta=25°C	
		285	W	Tc=25°C	
Operating and Storage Temperature range	Tch	150	°C		
	Tstg	-55 to + 150	°C		

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

Description	Symbol	Conditions	Conditions		typ.	max.	Unit	
Drain-Source Breakdown Voltage	BV _{DSS}	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		
	IDSS	V _{DS} =400V, V _{GS} =0V	T _{ch} =125°C	-	-	250	μA	
Gate-Source Leakage Current	Igss	V _{GS} =±30V, V _{DS} =0V	V _{GS} =±30V, V _{DS} =0V		10	100	nA	
Drain-Source On-State Resistance	Ros (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	
nput 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 _{cc} =300V V _{GS} =10V I _D =10.5A R _{GS} =10Ω		-	41	61.5	ns	
	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	nC	
Gate-Source Charge	Q _{GS}			-	23	34.5		
Gate-Drain Charge	Q _{GD}			-	26	39		
Gate-Drain Crossover Charge	Qsw			-	10	15		
Avalanche Capability	lav	L=1.27mH, T _{ch} =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 -di/dt=100A/µs, Tch=25°C		-	0.45	-	μs	
Reverse Recovery Charge	Qrr			-	7.2	-	μC	

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			0.440	°C/W
	Rth (ch-a)	Channel to Ambient			50.0	°C/W

Note *1 : Tch≤150°C

Note *2 : Stating Tch=25°C, I_{AS}=9A, L=16.2mH, Vcc=50V, R_G=50Ω.

E_{AS} limited by maximum channel temperature and avalanche current.

See to 'Avalanche Energy' graph.

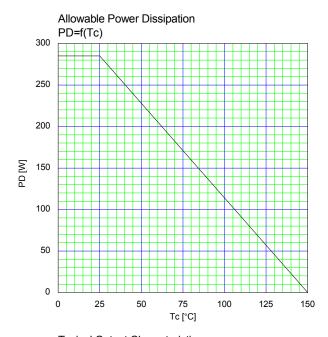
Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

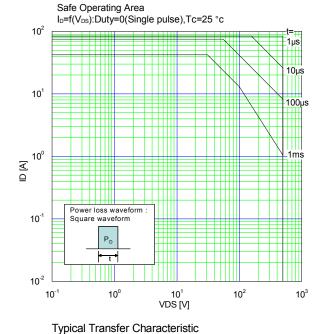
See to the 'Transient Themal impeadance' graph.

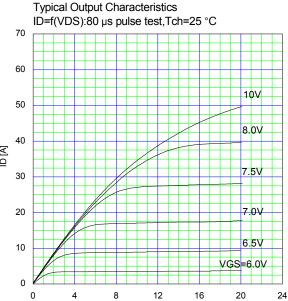
Note *4 : IF≤-ID, -di/dt=100A/µs, Vcc≤BVDss, Tch≤150°C.

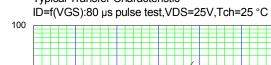
Note *5 : Ir≤-ID, dv/dt=5.7kV/µs, Vcc≤BVbss, Tch≤150°C.

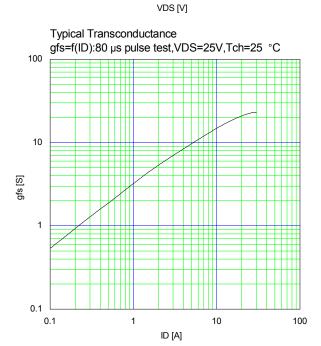
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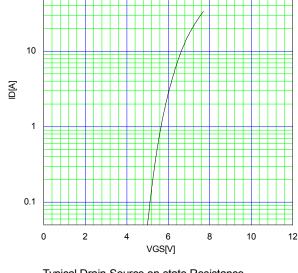


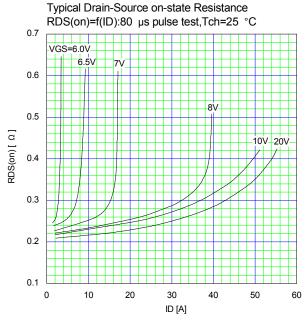




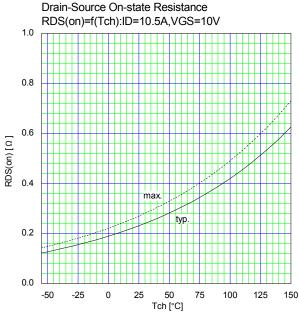


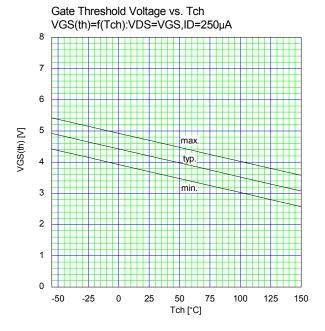


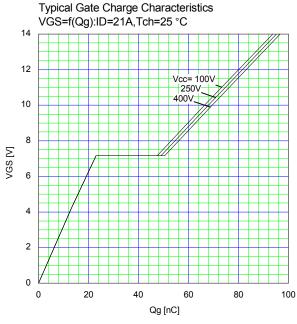


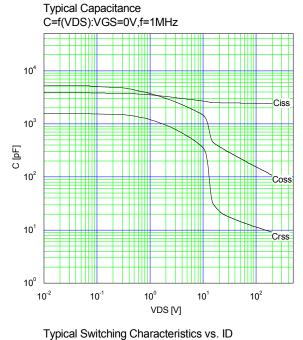


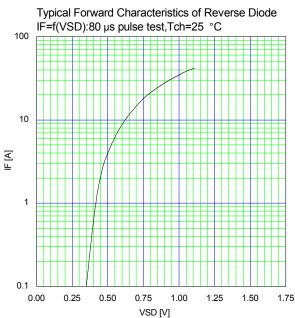
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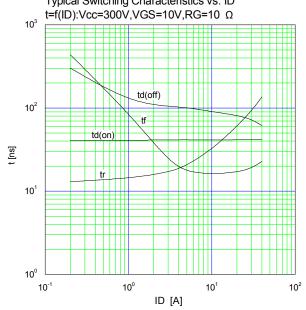


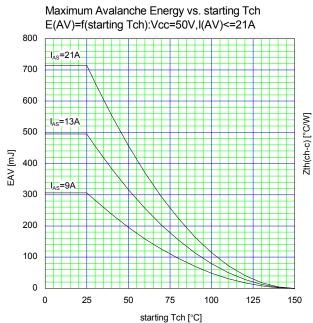


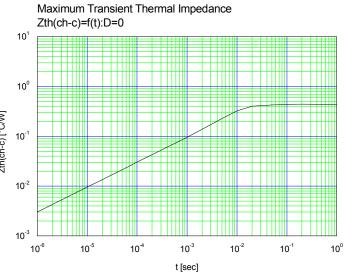












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· Aeronautic equipment

Safety devices

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