

FMC16N50ES

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 $(4.2\pm0.5V)$ High avalanche durability

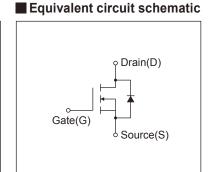
Applications

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

■ Maximum Ratings and Characteristics

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

■Outline Drawings [mm]



Description Symbol Characteristics Unit Remarks VDS **Drain-Source Voltage** VDSX 500 V V_{GS} = -30V **Continuous Drain Current** lο ±16 Α **Pulsed Drain Current** IDP ±64 Α Gate-Source Voltage Vgs ±30 Repetitive and Non-Repetitive Maximum Avalanche Current I_{AR} 16 Α Note*1 Non-Repetitive Maximum Avalanche Energy 485 Note*2 EAS mJ Repetitive Maximum Avalanche Energy EAR 22.5 Note*3 Peak Diode Recovery dV/dt dV/dt Note*4 48 kV/us Peak Diode Recovery -di/dt -di/dt 100 Note*5 A/µs 2.02 Ta=25°C **Maximum Power Dissipation** P_D W 225 Tc=25°C Tch 150 °C **Operating and Storage Temperature range** -55 to + 150 Tstg °C

● 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	Ipss	V _{DS} =500V, V _{GS} =0V	T _{ch} =25°C	-	-	25	μА
	IDSS	V _{DS} =400V, V _{GS} =0V	T _{ch} =125°C	-	-	250	
Gate-Source Leakage Current	Igss	V _{GS} =±30V, V _{DS} =0V		-	10	100	nA
Drain-Source On-State Resistance	R _{DS} (on)	I _D =8A, V _{GS} =10V		-	0.33	0.38	Ω
Forward Transconductance	g _{fs}	I _D =8A, V _{DS} =25V		5.5	11	-	S
Input Capacitance	Ciss	V _{DS} =25V	-	1700	2550	pF	
Output Capacitance	Coss	V _{GS} =0V	-	210	315		
Reverse Transfer Capacitance	Crss	f=1MHz	-	13	19.5		
Turn-On Time	td(on)	V _{cc} =300V V _{ds} =10V I _D =8A		-	37	55.5	ns
	tr			-	30	45	
Turn-Off Time	td(off)			-	87	130.5	
	tf	R _{GS} =18Ω	-	17	25.5		
Total Gate Charge	Q _G	V 050V		-	48	72	nC
Gate-Source Charge	Q _{GS}	V _{cc} =250V I _D =16A	-	17	25.5		
Gate-Drain Charge	Q _{GD}	V _{GS} =10V	-	18	27		
Gate-Drain Crossover Charge	Qsw	VG3-10V	-	7	10.5		
Avalanche Capability	lav	L=1.52mH, Tch=25°C		16	-	-	Α
Diode Forward On-Voltage	VsD	I _F =16A, V _{GS} =0V, T _{ch} =25°C		-	0.90	1.35	V
Reverse Recovery Time	trr	I _F =16A, V _{GS} =0V		-	0.46	-	μs
Reverse Recovery Charge	Qrr	-di/dt=100A/μs, Tch=25°C		-	6.0	-	μC

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			0.560	°C/W
	Rth (ch-a)	Channel to Ambient			75.0	°C/W

Note *1 : Tch≤150°C

Note *2 : Stating Tch=25°C, I_{AS}=7A, L=18.1mH, Vcc=50V, R_G=50Ω.

EAS limited by maximum channel temperature and avalanche current.

See to 'Avalanche Energy' graph.

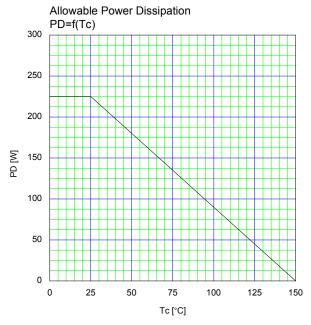
Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature

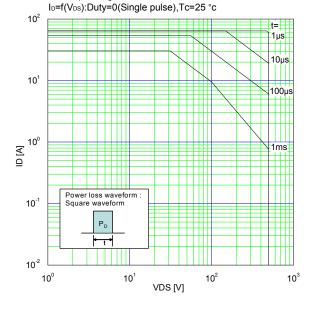
See to the 'Transient Themal impeadance' graph.

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

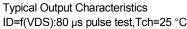
Note *5 : IF≤-ID, dv/dt=4.8kV/µs, Vcc≤BVbss, Tch≤150 °C.

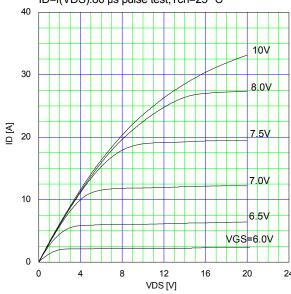
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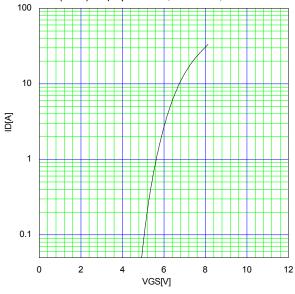


Safe Operating Area



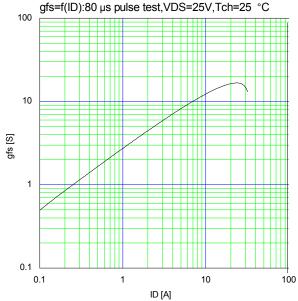


Typical Transfer Characteristic ID=f(VGS):80 µs pulse test,VDS=25V,Tch=25 °C

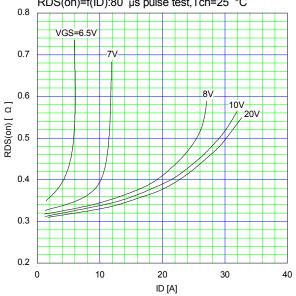


Typical Transconductance

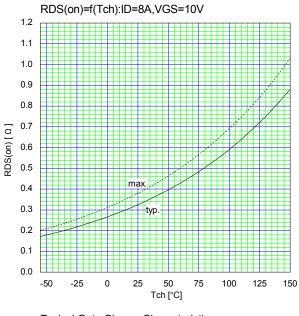
qfs=f(ID):80 us pulse test.VDS=25V.Tch=25 °C



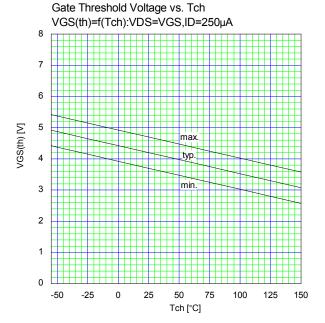
Typical Drain-Source on-state Resistance RDS(on)=f(ID):80 µs pulse test,Tch=25 °C

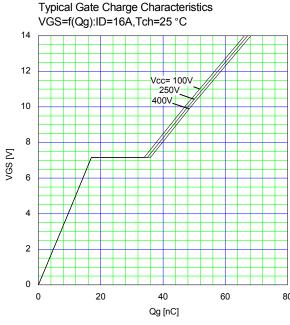


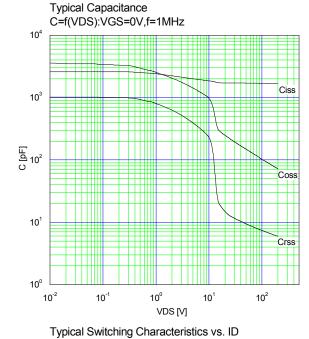
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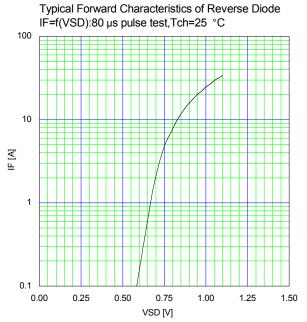


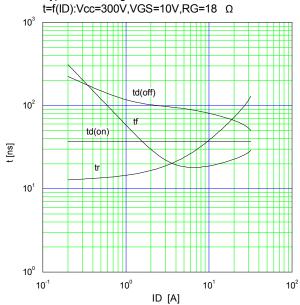
Drain-Source On-state Resistance

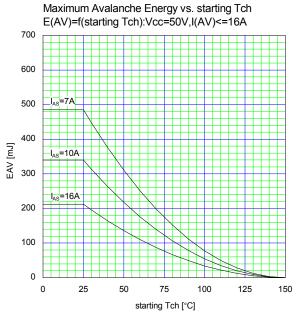


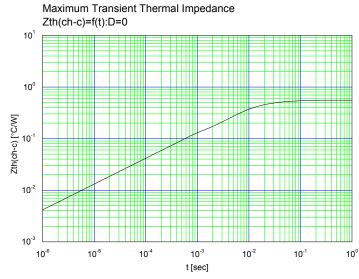












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