

FMC05N50E

FUJI POWER MOSFET

Super FAP-E³ series

N-CHANNEL SILICON POWER MOSFET

°C

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■ 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 (3.0±0.5V) High avalanche durability

Applications

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

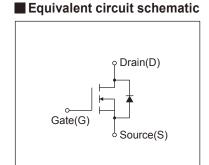
Operating and Storage Temperature range

Maximum Ratings and Characteristics

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

T-Pack(S)

■ Outline Drawings [mm]



Symbol Description Characteristics Unit Remarks V_{DS} **Drain-Source Voltage** V_{GS} = -30V VDSX 500 V **Continuous Drain Current** ΙD ±5 Α **Pulsed Drain Current** IDP ±20 Α Gate-Source Voltage Vgs ±30 Repetitive and Non-Repetitive Maximum Avalanche Current I_{AR} 5 Α Note*1 Non-Repetitive Maximum Avalanche Energy Note*2 EAS 171 mJ Repetitive Maximum Avalanche Energy E_{AR} 6.0 mJ Note*3 Peak Diode Recovery dV/dt dV/dt 5.3 kV/us Note*4 Peak Diode Recovery -di/dt -di/dt 100 Note*5 A/µs 1.67 Ta=25°C **Maximum Power Dissipation** P_{D} W 60 Tc=25°C

Tch

Tstg

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

Description	Symbol	Conditions		min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BVoss	I _D =250μA, V _{GS} =0V		500	-	-	V
Gate Threshold Voltage	V _{GS} (th)	I _D =250µA, V _{DS} =V _{GS}		2.5	3.0	3.5	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	Ros (on)	I _D =2.5A, V _{GS} =10V		-	1.28	1.50	Ω
Forward Transconductance	g fs	I _D =2.5A, V _{DS} =25V		2.5	5	-	S
Input Capacitance	Ciss	V _{DS} =25V V _{GS} =0V f=1MHz		-	610	915	pF
Output Capacitance	Coss			-	66	99	
Reverse Transfer Capacitance	Crss			-	4.7	7.1	
Turn-On Time	td(on)	V _{cc} =300V V _{dS} =10V I _D =2.5A R _G =24Ω		-	10	15	ns
	tr			-	7	10.5	
Turn-Off Time	td(off)			-	45	67.5	
	tf			-	13.5	20.3	
Total Gate Charge	QG	Vcc=250V In=5A Vss=10V		-	21	32	nC
Gate-Source Charge	QGS			-	6	9	
Gate-Drain Charge	Q _{GD}			-	5.5	8.3	
Avalanche Capability	lav	L=5.01mH, Tch=25°C		5	-	-	А
Diode Forward On-Voltage	V _{SD}	I _F =5A, V _{GS} =0V, T _{ch} =25°C	I _F =5A, V _{GS} =0V, T _{ch} =25°C		0.86	1.30	V
Reverse Recovery Time	trr	I _F =5A, V _{GS} =0V	I _F =5A, V _{GS} =0V		0.28	-	μs
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25°C		-	1.8	-	μC

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			1.200	°C/W
	Rth (ch-a)	Channel to Ambient			75.0	°C/W

Note *1 : Tch≤150°C

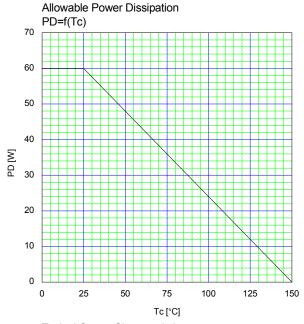
Note *2 : Stating Tch=25°C, Ias=2A, L=78.3mH, Vcc=50V, Rg=50 Ω Eas limited by maximum channel temperature and avalanche current. See to 'Avalanche Energy' graph. Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

150

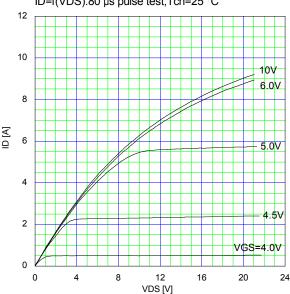
-55 to +150

See to the 'Transient Themal impeadance' graph.

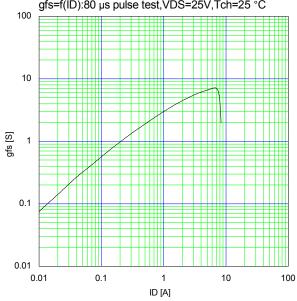
Note *4 : IF≤-ID, -di/dt=100A/µs, Vcc≤BVbss, Tch≤150°C. Note *5 : IF≤-ID, dv/dt=5.3kV/µs, Vcc≤BVbss, Tch≤150°C.



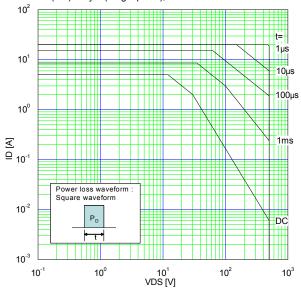
Typical Output Characteristics ID=f(VDS):80 µs pulse test,Tch=25 °C



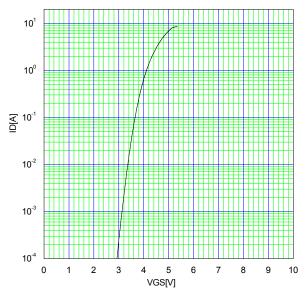
Typical Transconductance gfs=f(ID):80 µs pulse test,VDS=25V,Tch=25 °C



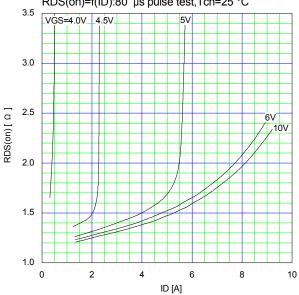
Safe Operating Area ID=f(VDS):Duty=0(Single pulse),Tc=25 °c

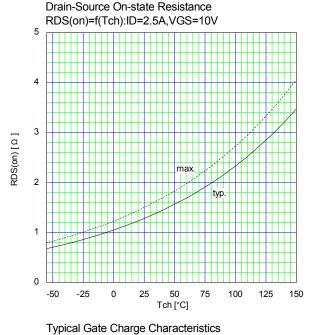


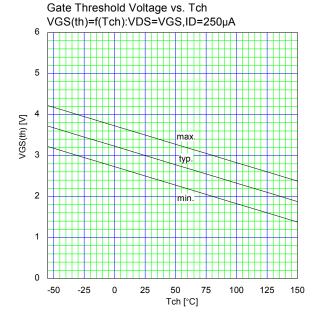
Typical Transfer Characteristic ID=f(VGS):80 µs pulse test,VDS=25V,Tch=25 °C

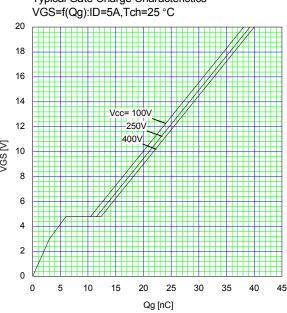


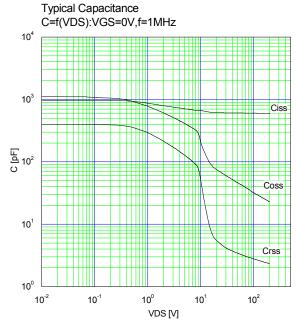
Typical Drain-Source on-state Resistance RDS(on)=f(ID):80 µs pulse test,Tch=25 °C

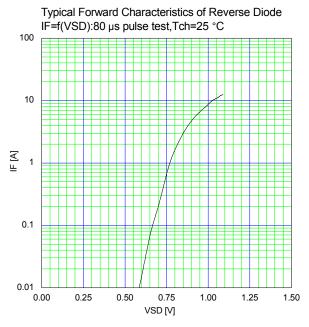


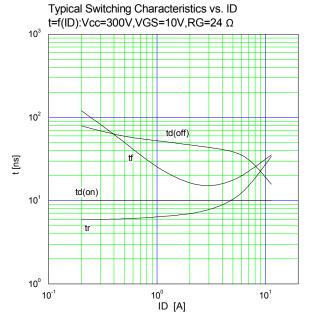


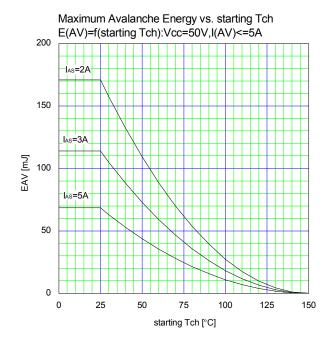


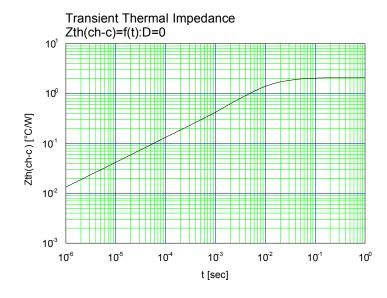












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