

# FMV08N50E

**FUJI POWER MOSFET** 

## Super FAP-E<sup>3</sup> series

#### **N-CHANNEL SILICON POWER MOSFET**

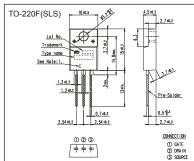
#### ■ Features

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 (3.0±0.5V) High avalanche durability

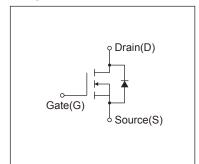
#### Applications

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

### Outline Drawings [mm]



#### **■** Equivalent circuit schematic



#### ■ Maximum Ratings and Characteristics

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

Description	Symbol	Characteristics	Unit	Remarks
Dunim Course Voltage	V <sub>DS</sub>	500	V	
Drain-Source Voltage	V <sub>DSX</sub>	500	V	V <sub>GS</sub> = -30V
Continuous Drain Current	ID	±7.5	Α	
Pulsed Drain Current	IDP	±30	Α	
Gate-Source Voltage	V <sub>GS</sub>	±30	V	
Repetitive and Non-Repetitive Maximum Avalanche Current	Iar	7.5	А	Note*1
Non-Repetitive Maximum Avalanche Energy	Eas	301.1	mJ	Note*2
Repetitive Maximum Avalanche Energy	Ear	3.7	mJ	Note*3
Peak Diode Recovery dV/dt	dV/dt	5.9	kV/μs	Note*4
Peak Diode Recovery -di/dt	-di/dt	100	A/µs	Note*5
Maniana Bana Biasiastian	PD	2.16	W	Ta=25°C
Maximum Power Dissipation		37	VV	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	Conditions		typ.	max.	Unit	
Drain-Source Breakdown Voltage	BVDSS	I <sub>D</sub> =250µA, V <sub>GS</sub> =0V	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V		-	-	V	
Gate Threshold Voltage	V <sub>GS</sub> (th)	In=250µA, Vns=Vgs	I <sub>D</sub> =250µA, V <sub>DS</sub> =V <sub>GS</sub>		3.0	3.5	V	
Zero Gate Voltage Drain Current		V <sub>DS</sub> =500V, V <sub>GS</sub> =0V	Tch=25°C	-	-	25		
	Inss	V <sub>DS</sub> =400V, V <sub>GS</sub> =0V	T <sub>ch</sub> =125°C	-	-	250	μA	
Gate-Source Leakage Current	Igss	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V		10	100	nA	
Drain-Source On-State Resistance	Ros (on)	I <sub>D</sub> =3.8A, V <sub>GS</sub> =10V		-	0.68	0.79	Ω	
Forward Transconductance	<b>g</b> fs	I <sub>D</sub> =3.8A, V <sub>DS</sub> =25V		4	8	-	S	
Input Capacitance	Ciss	V <sub>DS</sub> =25V V <sub>GS</sub> =0V		-	1100	1650	pF	
Output Capacitance	Coss			-	100	150		
Reverse Transfer Capacitance	Crss	f=1MHz		-	7.5	11		
Turn-On Time	td(on)	V <sub>cc</sub> =300V V <sub>cs</sub> =10V I <sub>D</sub> =3.8A R <sub>cs</sub> =18Ω		-	17	26	ns	
	tr			-	8.0	12		
Turn-Off Time	td(off)			-	80	120		
	tf			-	15	23		
Total Gate Charge	QG	Vcc=250V	V <sub>cc</sub> =250V I <sub>D</sub> =7.5A		35	53	nC	
Gate-Source Charge	Qss	Ip=7.5A			9.0	14		
Gate-Drain Charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		-	10	15		
Avalanche Capability	lav	L=3.93mH, Tch=25°C	L=3.93mH, Tch=25°C		-	-	Α	
Diode Forward On-Voltage	V <sub>SD</sub>	I <sub>F</sub> =7.5A, V <sub>GS</sub> =0V, T <sub>ch</sub> =25°	I <sub>F</sub> =7.5A, V <sub>GS</sub> =0V, T <sub>ch</sub> =25°C		0.90	1.35	V	
Reverse Recovery Time	trr	I <sub>F</sub> =7.5A, V <sub>GS</sub> =0V	I <sub>F</sub> =7.5A, V <sub>GS</sub> =0V		0.35	-	μs	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25	-di/dt=100A/µs, Tch=25°C		3.5	-	μC	

#### Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			3.38	°C/W
	Rth (ch-a)	Channel to Ambient			58.0	°C/W

Note \*1 : Tch≤150°C

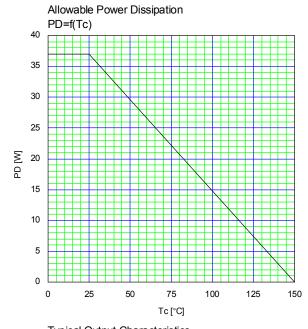
Note \*2 : Stating Tch=25°C, Ias=3.0A, L=61.3mH, Vcc=50V, R<sub>G</sub>=50Ω
Eas limited by maximum channel temperature and avalanche current.
See to 'Avalanche Energy' graph.

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

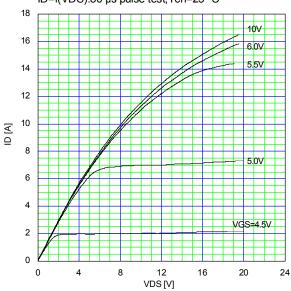
See to the 'Transient Themal impeadance' graph.

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

Note \*5 : Ir≤-lp, dv/dt=5.9kV/µs, Vcc≤BVbss, Tch≤150°C.

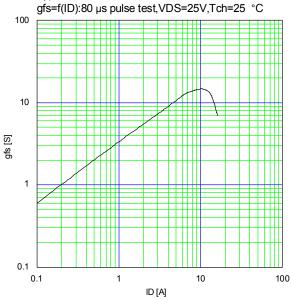


Typical Output Characteristics ID=f(VDS):80 µs pulse test, Tch=25 °C

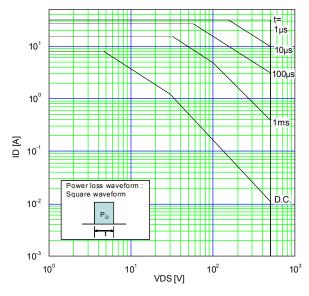


Typical Transconductance

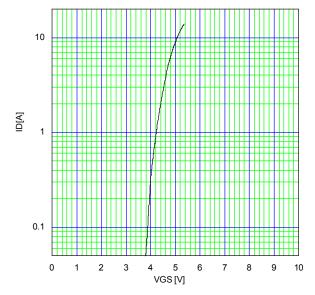
ofs=f(ID):80 us pulse test.VDS=25V.Tch=25 °C



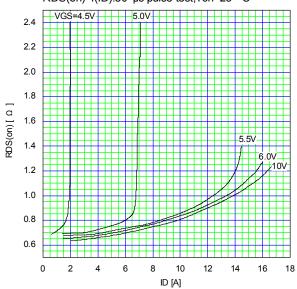
Safe Operating Area ID=f(VDS):Duty=0(Single pulse),Tc=25 °c

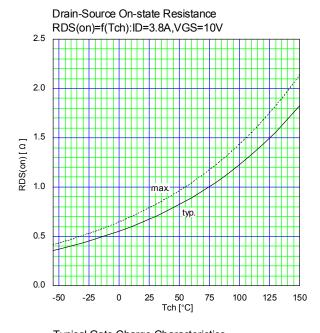


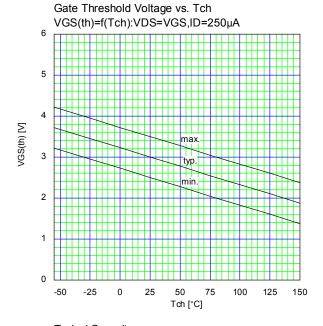
Typical Transfer Characteristic ID=f(VGS):80 µs pulse test,VDS=25V,Tch=25 °C

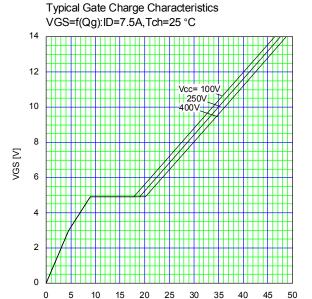


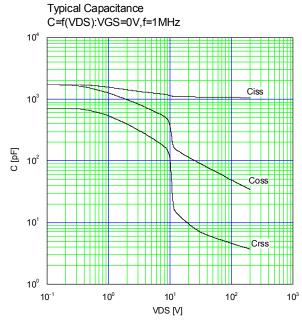
Typical Drain-Source on-state Resistance RDS(on)=f(ID):80 µs pulse test,Tch=25 °C

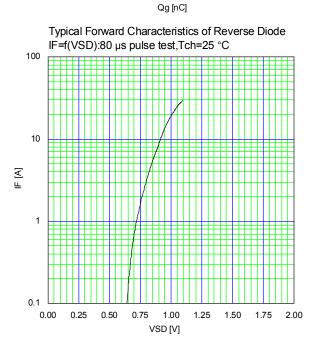


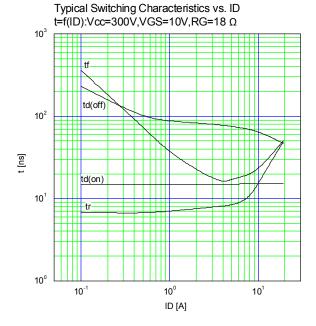


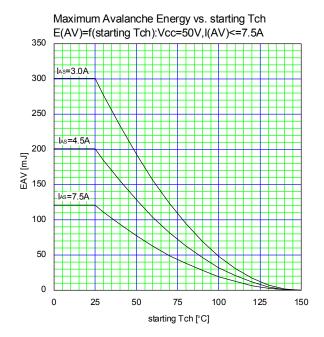


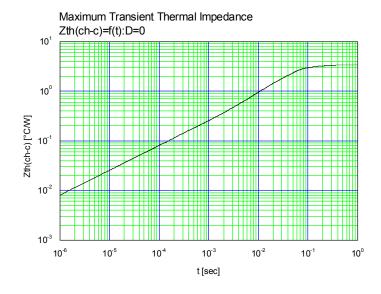












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