

# FMP06N60ES

**FUJI POWER MOSFET** 

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

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

#### ■ Features

Maintains both low power loss and low noise Lower R<sub>DS</sub>(on) characteristic More controllable switching dv/dt by gate resistance Smaller V<sub>GS</sub> ringing waveform during switching Narrow band of the gate threshold voltage (3.7±0.5V) High avalanche durability

### Applications

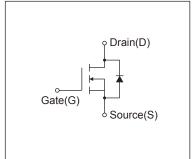
Switching regulators UPS (Uninterruptible Power Supply) DC-DC converters

## Maximum Ratings and Characteristics

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

# ■ Outline Drawings [mm] TO-220AB ① ② ③

# **■** Equivalent circuit schematic Drain(D)



Description	Symbol	Characteristics	Unit	Remarks	
Drain Cauras Valtara	V <sub>DS</sub>	600	V		
Drain-Source Voltage	V <sub>DSX</sub>	600	V	V <sub>GS</sub> = -30V	
Continuous Drain Current	ID	±6	Α		
Pulsed Drain Current	I <sub>DP</sub>	±24	А		
Gate-Source Voltage	V <sub>GS</sub>	±30	V		
Repetitive and Non-Repetitive Maximum Avalanche Current	Iar	6	А	Note*1	
Non-Repetitive Maximum Avalanche Energy	Eas	313.7	mJ	Note*2	
Repetitive Maximum Avalanche Energy	Ear	10.5	mJ	Note*3	
Peak Diode Recovery dV/dt	dV/dt	3.8	kV/μs	Note*4	
Peak Diode Recovery -di/dt	-di/dt	100	A/µs	Note*5	
Maximum Power Dissipation	Po	2.02	14/	Ta=25°C	
		105	W	Tc=25°C	
Operating and Storage Temperature range	Tch	150	°C		
	T <sub>sto</sub>	-55 to + 150	°C		

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

Description	Symbol	Conditions		min.	typ.	max.	Unit	
Drain-Source Breakdown Voltage	BVDSS	I <sub>D</sub> =250µA, V <sub>GS</sub> =0V		600	-	-	V	
Gate Threshold Voltage	V <sub>GS</sub> (th)	I <sub>D</sub> =250µA, V <sub>DS</sub> =V <sub>GS</sub>		3.2	3.7	4.2	V	
Zero Gate Voltage Drain Current		V <sub>DS</sub> =600V, V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	-	-	25		
	IDSS	V <sub>DS</sub> =480V, 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		-	10	100	nA	
Drain-Source On-State Resistance	Ros (on)	I <sub>D</sub> =3A, V <sub>GS</sub> =10V		-	1.03	1.20	Ω	
Forward Transconductance	g <sub>fs</sub>	I <sub>D</sub> =3.0A, V <sub>DS</sub> =25V		2.5	5	-	S	
Input Capacitance	Ciss	V <sub>DS</sub> =25V V <sub>GS</sub> =0V f=1MHz		-	950	1425	pF	
Output Capacitance	Coss			-	100	150		
Reverse Transfer Capacitance	Crss			-	7.5	11		
Turn-On Time         td(           tr         tr	td(on)	V <sub>cc</sub> =300V V <sub>GS</sub> =10V I <sub>D</sub> =3.0A R <sub>G</sub> =27Ω		-	29	43.5	ns	
	tr			-	15	22.5		
Turn-Off Time	td(off)			-	75	113		
	tf			-	16	24		
Total Gate Charge	Q <sub>G</sub>	V <sub>cc</sub> =300V I <sub>D</sub> =6A V <sub>GS</sub> =10V		-	31	46.5	nC	
Gate-Source Charge	Q <sub>GS</sub>			-	10.5	15.8		
Gate-Drain Charge	Q <sub>GD</sub>			-	8	12		
Gate-Drain Crossover Charge	Qsw			-	4.5	6.75		
Avalanche Capability	lav	L=6.39mH, Tch=25°C		6	-	-	Α	
Diode Forward On-Voltage	V <sub>SD</sub>	I <sub>F</sub> =6A, V <sub>GS</sub> =0V, T <sub>ch</sub> =25°C		-	0.90	1.35	V	
Reverse Recovery Time	trr	I <sub>F</sub> =6A, V <sub>GS</sub> =0V		-	0.4	-	μs	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25°C		-	3.3	-	μC	

## Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to Case			1.19	°C/W
	Rth (ch-a)	Channel to Ambient			62.0	°C/W

Note \*1 : Tch≤150°C.

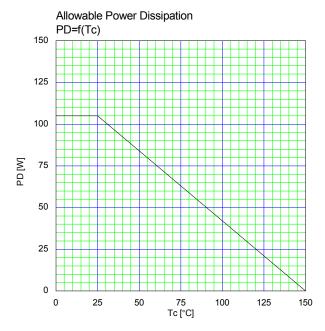
Note \*2 : Stating Tch=25°C, Ias=2.4A, L=99.8mH, Vcc=60V, Rg=50 $\Omega$ . Eas limited by maximum channel temperature and avalanche current. See to 'Avalanche Energy' graph.

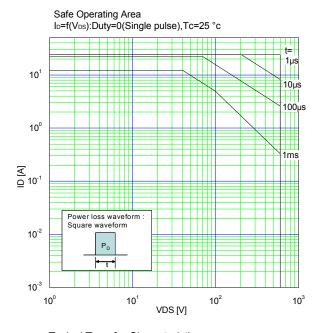
Note \*3 : Repetitive rating : Pulse width limited by maximum channel temperature.

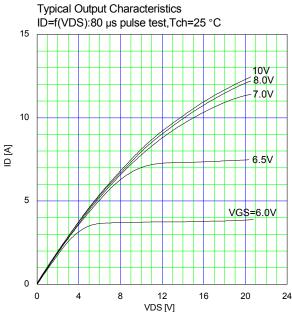
See to the 'Transient Themal impeadance' graph.

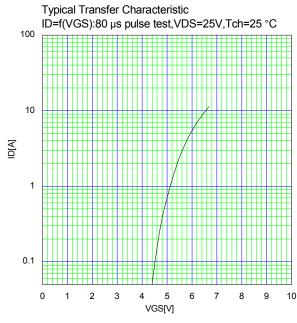
Note \*4: IFS-ID, -di/dt=100A/µs, Vcc≤BVbss, Tch≤150°C. Note \*5 : Ir $\leq$ -ID, dv/dt=3.8kV/ $\mu$ s, Vcc $\leq$ BVDSS, Tch $\leq$ 150°C

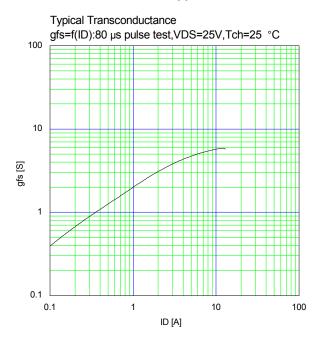
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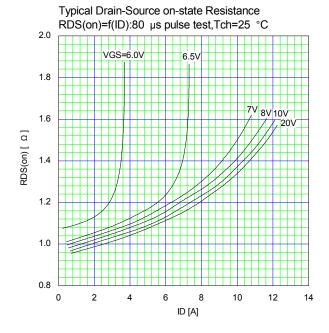




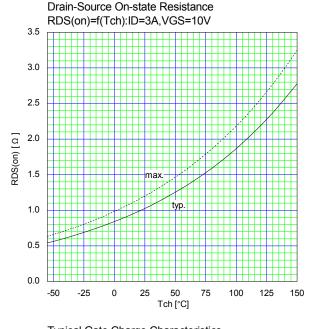


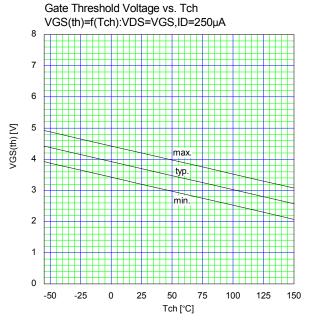


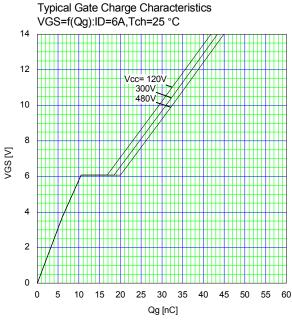


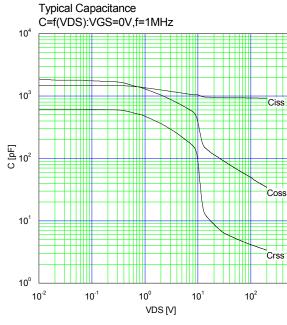


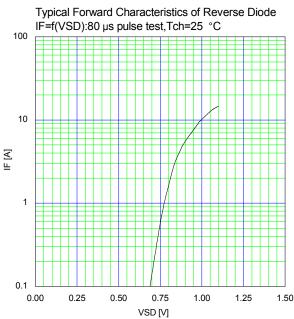
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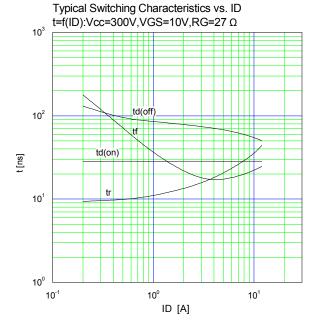


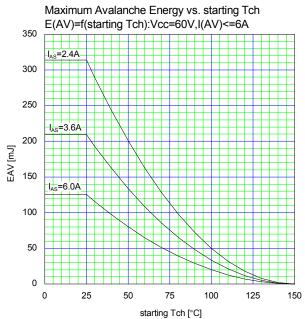


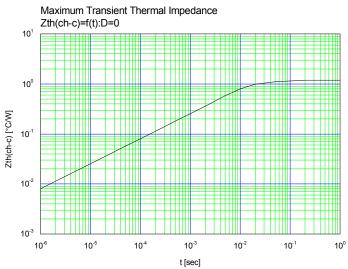












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