

FMV09N90E

FUJI POWER MOSFET

Super FAP-E³ 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 (4.0±0.5V) High avalanche durability

Applications

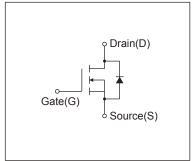
Switching regulators UPS (Uninterruptible Power Supply) DC-DC converters

Maximum Ratings and Characteristics

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

■ Outline Drawings [mm] TO-220F(SLS)

■ Equivalent circuit schematic



Description	Symbol	Characteristics	Unit	Remarks	
Proin Source Veltore	V _{DS}	900	V		
Drain-Source Voltage	V _{DSX}	900	V	V _{GS} = -30V	
Continuous Drain Current	I _D	±9	А		
Pulsed Drain Current	IDP	±36	А		
Gate-Source Voltage	V _{GS}	±30	V		
Repetitive and Non-Repetitive Maximum AvalancheCurrent	IAR	9	А	Note*1	
Non-Repetitive Maximum Avalanche Energy	Eas	565.3	mJ	Note*2	
Repetitive Maximum Avalanche Energy	Ear	8.5	mJ	Note*3	
Peak Diode Recovery dV/dt	dV/dt	2.1	kV/μs	Note*4	
Peak Diode Recovery -di/dt	-di/dt	100	A/µs	Note*5	
Maximum Power Dissipation	Po	2.16	10/	Ta=25°C	
		85	W	Tc=25°C	
	Tch	150	°C		
Operating and Storage Temperature range	T _{stq}	-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 _D =250μA, V _{GS} =0V		900	-	-	V	
Gate Threshold Voltage	V _{GS} (th)	I _D =250µA, V _{DS} =V _{GS}		3.5	4.0	4.5	V	
Zero Gate Voltage Drain Current		V _{DS} =900V, V _{GS} =0V	T _{ch} =25°C	-	-	25		
	IDSS	V _{DS} =720V, 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 =4.5A, V _{GS} =10V		-	1.16	1.4	Ω	
Forward Transconductance	g fs	I _D =4.5A, V _{DS} =25V		5.0	10	-	S	
Input Capacitance	Ciss	V _{DS} =25V V _{GS} =0V f=1MHz		-	1700	2550	pF	
Output Capacitance	Coss			-	150	225		
Reverse Transfer Capacitance	Crss			-	11	17		
Turn-On Time	td(on)	V _{cc} =600V V _{cs} =10V I _D =4.5A R _G =24Ω		-	35	53	ns	
	tr			-	30	45		
Turn-Off Time	td(off)			-	110	165		
	tf			-	30	45		
Total Gate Charge	Q _G	V _{cc} =450V I _D =9A V _{GS} =10V		-	50	75	nC	
Gate-Source Charge	QGS			-	15	23		
Gate-Drain Charge	Q _{GD}			-	16	24		
Gate-Drain Crossover Charge	Qsw			-	6	9		
Avalanche Capability	lav	L=5.12mH, Tch=25°C		9	-	-	А	
Diode Forward On-Voltage	VsD	I _F =9A, V _{GS} =0V, T _{ch} =25°C		-	0.90	1.35	V	
Reverse Recovery Time	trr	I _F =9A, V _{GS} =0V		-	1.8	-	μS	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25	°C	-	15	-	μC	

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to case			1.471	°C/W
	Rth (ch-a)	Channel to ambient			58.0	°C/W

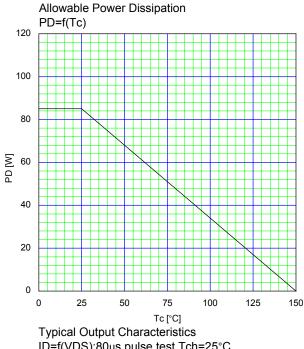
Note *1 : Tch≤150°C

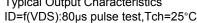
Note *2 : Stating Tch=25°C, Ias=3.6A, L=80.0mH, Vcc=90V, Rg=10 Ω Eas limited by maximum channel temperature and avalanche current. See to 'Avalanche current' graph.

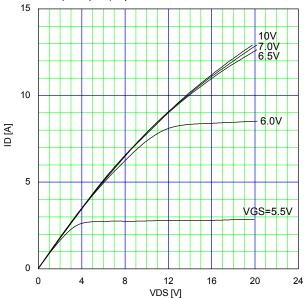
Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature

See to the 'Transient Themal impeadance' graph.

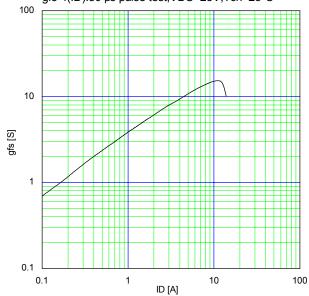
Note *4 : IFS-ID, -di/dt=100A/µs, Vcc≤BVoss, Tch≤150°C. Note *5 : IF \leq -ID, dv/dt=2.1kV/ μ s, Vcc \leq BVDSS, Tch \leq 150°C.



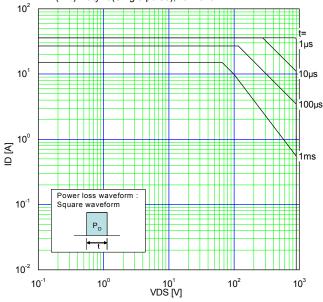




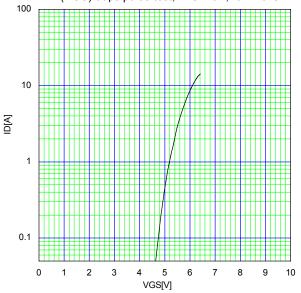
Typical Transconductance gfs=f(ID):80 μ s pulse test,VDS=25V,Tch=25°C



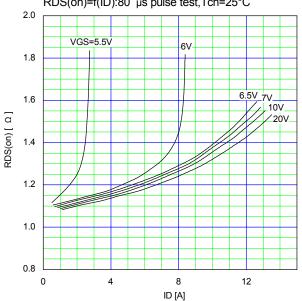
Safe Operating Area ID=f(VDS):Duty=0(Single pulse),Tc=25°c



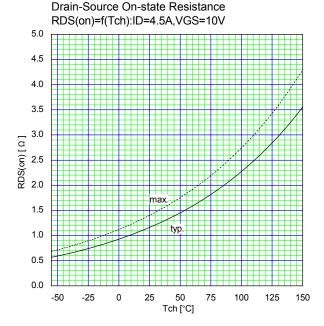
Typical Transfer Characteristic ID=f(VGS):80µs pulse test,VDS=25V,Tch=25°C



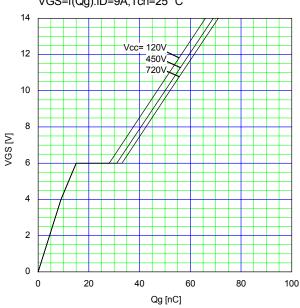
Typical Drain-Source on-state Resistance RDS(on)=f(ID):80 µs pulse test,Tch=25°C



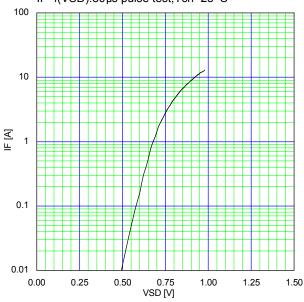
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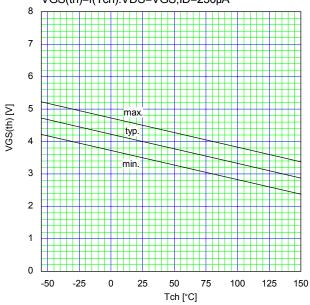
Typical Gate Charge Characteristics VGS=f(Qg):ID=9A,Tch=25 °C



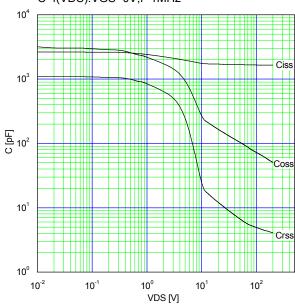
Typical Forward Characteristics of Reverse Diode IF=f(VSD):80 μ s pulse test,Tch=25 $^{\circ}$ C



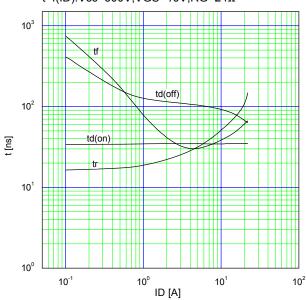
Gate Threshold Voltage vs. Tch VGS(th)=f(Tch):VDS=VGS,ID=250µA

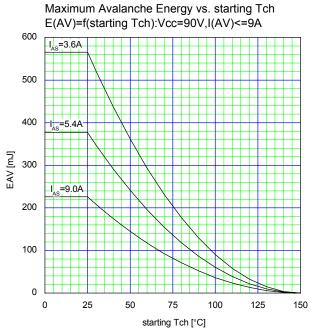


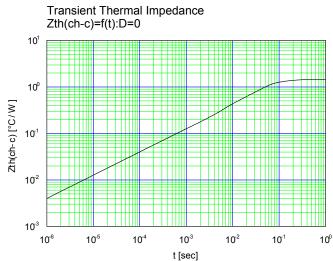
Typical Capacitance C=f(VDS):VGS=0V,f=1MHz



Typical Switching Characteristics vs. ID t=f(ID):Vcc=600V,VGS=10V,RG=24 Ω







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