

FMC12N60ES

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

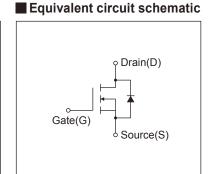
Applications

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]



Symbol Description Characteristics Unit Remarks V_{DS} **Drain-Source Voltage** V_{GS} = -30V VDSX 600 V **Continuous Drain Current** ΙD ±12 Α **Pulsed Drain Current** IDP ±48 Α Gate-Source Voltage Vgs ±30 Repetitive and Non-Repetitive Maximum AvalancheCurrent I_{AR} 12 Α Note*1 Non-Repetitive Maximum Avalanche Energy 384 Note*2 EAS mJ Repetitive Maximum Avalanche Energy E_{AR} 18 mJ Note*3 Peak Diode Recovery dV/dt dV/dt Note*4 44 kV/us Peak Diode Recovery -di/dt -di/dt 100 Note*5 A/µs 1.67 Ta=25°C **Maximum Power Dissipation** P_{D} W 180 Tc=25°C Tch 150 °C **Operating and Storage Temperature range** Tstg -55 to + 150 °C Isolation Voltage t = 60sec, f = 60Hz kVrms Viso

● 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		600	-	-	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		V _{DS} =600V, V _{GS} =0V	Tch=25°C	-	-	25		
	IDSS	V _{DS} =480V, V _{GS} =0V	Tch=125°C	-	-	250	μA	
Gate-Source Leakage Current	Igss	V _{GS} =±30V, V _{DS} =0V		-	10	100	nA	
Drain-Source On-State Resistance	R _{DS} (on)	I _D =6A, V _{GS} =10V		-	0.641	0.75	Ω	
Forward Transconductance	g fs	I _D =6A, V _{DS} =25V		4	8	-	S	
Input Capacitance	Ciss	V _{DS} =25V	-	1300	1950	pF		
Output Capacitance	Coss	V _{GS} =0V	-	150	225			
Reverse Transfer Capacitance	Crss	f=1MHz	-	8.5	13			
Turn-On Time	td(on)	Vcc=300V	-	40	60	ns		
	tr	V _{GS} =10V I _D =6A		-	40		60	
Turn-Off Time	td(off)			-	74		111	
	tf	R _G =27Ω	-	19	29			
Total Gate Charge	Q _G			-	37	56	nC	
Gate-Source Charge	Qss	V _{cc} =300V I _D =12A	-	15	23			
Gate-Drain Charge	Q _{GD}	V _{GS} =10V	-	12	18			
Gate-Drain Crossover Charge	Qsw	V 03 - 10 V	-	6.5	10			
Avalanche Capability	lav	L=2.64mH, Tch=25°C		12	-	-	Α	
Diode Forward On-Voltage	VsD	I _F =12A, V _{GS} =0V, T _{ch} =25°C		-	0.86	1.30	V	
Reverse Recovery Time	trr	I _F =12A, V _{GS} =0V		-	0.52	-	μS	
Reverse Recovery Charge	Qrr	-di/dt=100A/µs, Tch=25°C	-	5.5	-	μC		

Thermal Characteristics

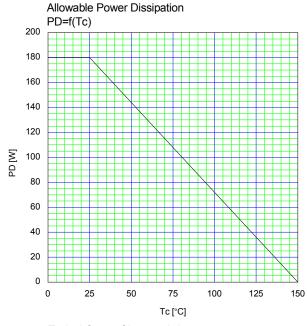
Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	Rth (ch-c)	Channel to case			0.690	°C/W
	Rth (ch-a)	Channel to ambient			75.0	°C/W

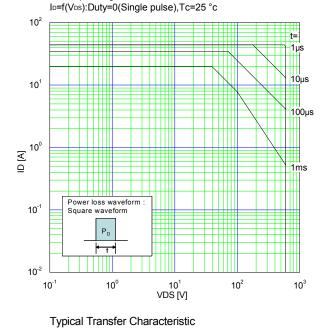
Note *1 : Tch≤150°C

Note *2 : Stating Tch=25°C, I_{AS}=5A, L=28.2mH, Vcc=60V, R_G=50Ω E_{AS} limited by maximum channel temperature and avalanche current. See to 'Avalanche Energy' graph. Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

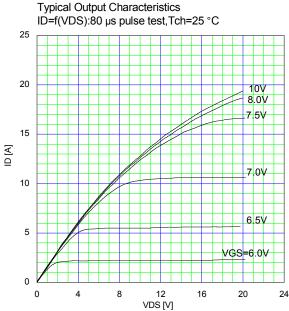
See to the 'Transient Themal impeadance' graph.

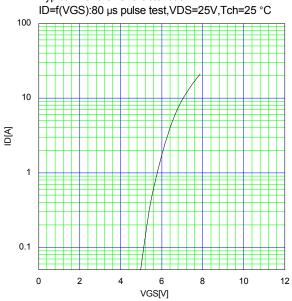
Note *4 : IF≤-Ip, -di/dt=100A/µs, Vcc≤BVpss, Tch≤150°C. Note *5 : IF≤-Ip, dv/dt=4.4kV/µs, Vcc≤BVpss, Tch≤150°C

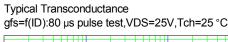


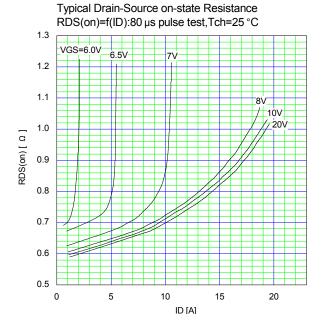


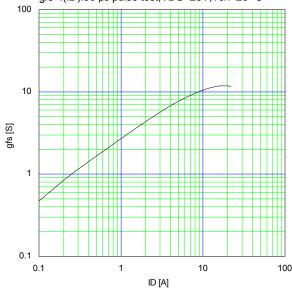
Safe Operating Area



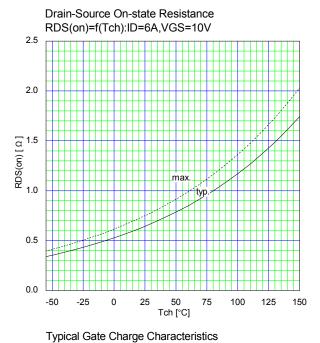


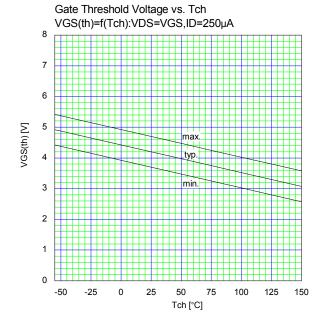


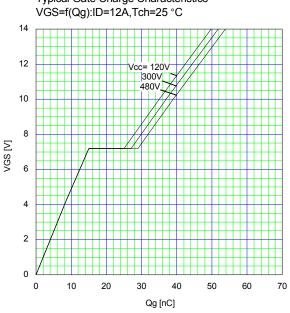


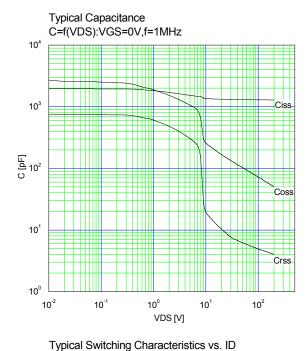


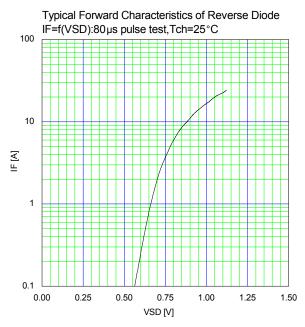
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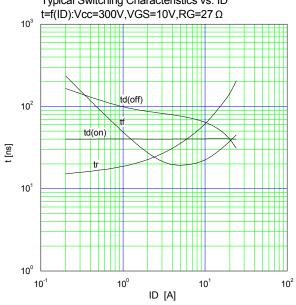


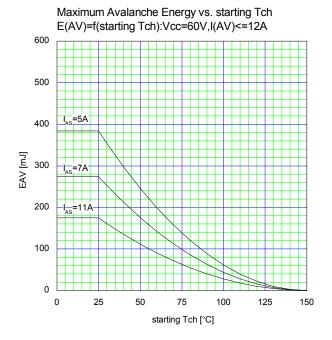


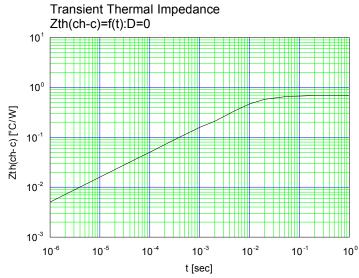












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