

N-Channel Enhancement Mode Power MOSFET

Description

The FNK8604 uses advanced trench technology to provide excellent R_{DS(ON)}, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications .lt is ESD protested.

General Features

- VDS = 20V,ID =8A RDS(ON) < 19mΩ @ VGS=2.5V RDS(ON) < 15mΩ @ VGS=4.5V ESD Rating: 2500V HBM
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- Uni-directional load switch
- Bi-directional load switch
- Battery protection



Schematic diagram



Marking and pin assignment

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	Vds	20	V
Gate-Source Voltage	Vgs	±12	V
Drain Current-Continuous	lo	8	A
Drain Current-Pulsed (Note 1)	Юм	30	A
Maximum Power Dissipation	PD	2	W
Operating Junction and Storage Temperature Range	TJ,Tsтg	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	Reja	70.5	W ℃

Electrical Characteristics (T_A=25[°]C unless otherwise noted)

Parameter	Symbol	Symbol Condition		Тур	Max	Unit
Off Characteristics			-			
Drain-Source Breakdown Voltage	BVDSS	Vgs=0V Id=250µA	20			V
Zero Gate Voltage Drain Current	ldss	VDS=20V,VGS=0V	-	-	1	μA
Parameter	Symbol	Condition	Min	Тур	Max	Unit
Gate-Body Leakage Current	lgss	Vgs=±10V,Vds=0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	VGS(th)	Vds=Vgs,Id=250µA	0.45	0.7	1.0	V
Drain-Source On-State Resistance	VGS=4.5V, ID=5A - 11		11	15	mΩ	
		Vgs=2.5V, Id=4A	-	15	19	mΩ



Forward Transconductance	g fs	VDS=5V,ID=5A	-	15	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	Clss	VDS=10V,VGS=0V, F=1.0MHz	-	1275	-	PF
Output Capacitance	Coss		I	210	-	PF
Reverse Transfer Capacitance	Crss		-	180	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	td(on)	VDD=10V,RL=1.2Ω	-	2.5		nS
		Vgs=10V,Rgen=3 Ω				
Turn-on Rise Time	tr		-	7.2		nS
Turn-Off Delay Time	td(off)	1	-	49		nS
Turn-Off Fall Time	tr		-	10.8		nS
Total Gate Charge	Qg	V _{DS} =10V,I _D =8A, V _{GS} =4.5V	-	17.9		nC
Gate-Source Charge	Qgs		-	1.5	-	nC
Gate-Drain Charge	Qgd		-	4.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	Vsd	Vgs=0V,Is=8A	-	-	1.2	V
Diode Forward Current (Note 2)	ls		-	-	8	А

Notes:

- Repetitive Rating: Pulse width limited by maximum junction temperature.
 Surface Mounted on FR4 Board, t ≤ 10 sec.
 Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
 Guaranteed by design, not subject to production



FNK8604

Typical Electrical and Thermal Characteristics



Figure 1:Switching Test Circuit



Figure 2:Switching Waveforms





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Figure 14 Normalized Maximum Transient Thermal Impedance



PDFNWB(3.3×3.3)-8L-B(P0.65T0.80) PACKAGE OUTLINE DIMENSIONS





<u>Bottom View</u> [背视图]



Symbol	Dimensions	In Millimeters	Dimensions In Inches		
Symbol	Min.	Max.	Min.	Max.	
A	0.650	0.850	0.026	0.033	
A1	0.152	REF.	0.006 REF.		
A2	0~0).05	0~0.002		
D	2.900	3.100	0.114	0.122	
D1	0.935	1.135	0.037	0.045	
D2	0.280	0.480	0.011	0.019	
E	2.900	3.100	0.114	0.122	
E1	3.150	3.450	0.124	0.136	
E2	1.535	1.935	0.060	0.076	
b	0.200	0.400	0.008	0.016	
е	0.550	0.750	0.022	0.030	
L	0.300	0.500	0.012	0.020	
L1	0.180	0.480	0.007	0.019	
L2	0~0.100		0~0.004		
L3	0~0.100		0~0.004		
Н	0.315	0.515	0.012	0.020	
θ	9°	13°	9°	13°	



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