

FNK N-Channel Enhancement Mode Power MOSFET

Description

The FNK8606 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

$$V_{DS} = 20V, I_D = 9A$$

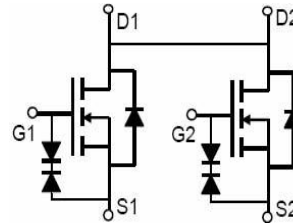
$$R_{DS(ON)} < 16 m\Omega @ V_{GS} = 2.5V$$

$$R_{DS(ON)} < 11 m\Omega @ V_{GS} = 4.5V$$

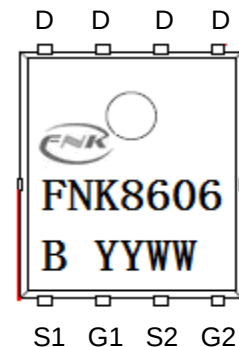
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM application
- Load switch



Schematic diagram



Marking and pin Assignment

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8606	FNK8606	PDFN3*3-8L	Ø180mm	8mm	3000 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	9	A
Drain Current-Pulsed (Note 1)	I_{DM}	35	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83.3	°C/W
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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20		-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1	μA

Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V,V _{DS} =0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	0.5	0.7	1	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A	-	9.1	11	mΩ
		V _{GS} =2.5V, I _D =5A	-	11.5	16	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =7A	-	20	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{Iss}	V _{DS} =10V,V _{GS} =0V, F=1.0MHz	-	1150	-	PF
Output Capacitance	C _{Oss}		-	185	-	PF
Reverse Transfer Capacitance	C _{rss}		-	145	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V,R _L =1.35Ω V _{GS} =5V,R _{GEN} =3Ω	-	6		nS
Turn-on Rise Time	t _r		-	13		nS
Turn-Off Delay Time	t _{d(off)}		-	52		nS
Turn-Off Fall Time	t _f		-	16		nS
Total Gate Charge	Q _g	V _{DS} =10V,I _D =7A, V _{GS} =4.5V	-	15		nC
Gate-Source Charge	Q _{gs}		-	0.8	-	nC
Gate-Drain Charge	Q _{gd}		-	3.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =1A	-	-	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	7	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

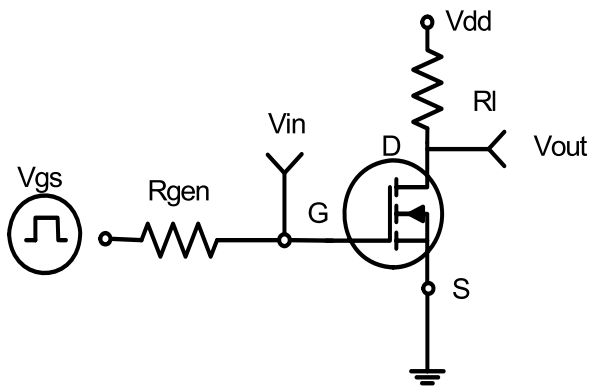


Figure 1: Switching Test Circuit

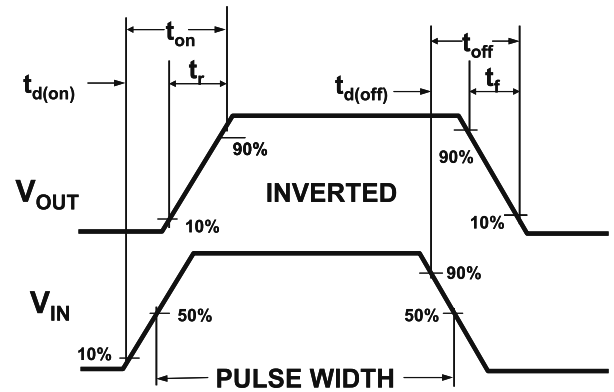


Figure 2: Switching Waveforms

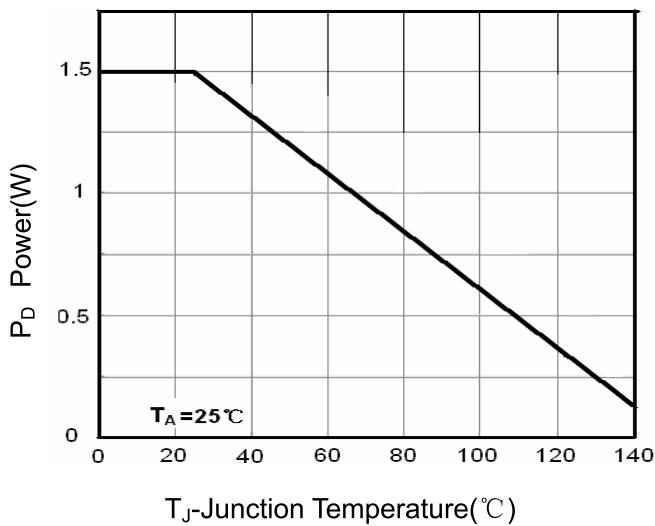


Figure 3 Power Dissipation

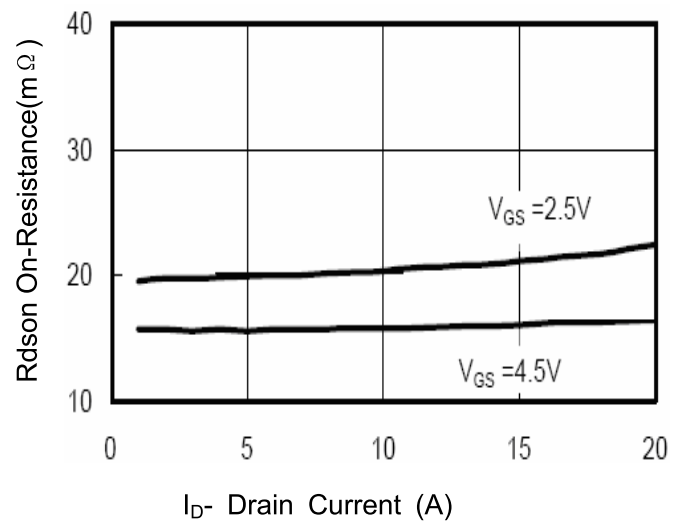


Figure 6 Drain-Source On-Resistance

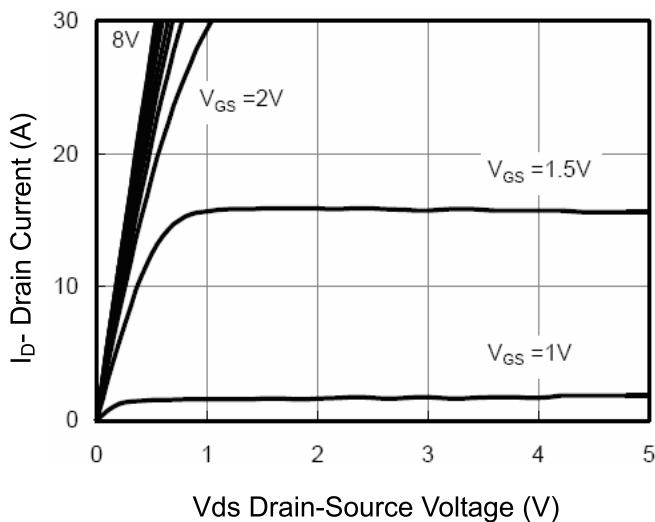


Figure 5 Output CHARACTERISTICS

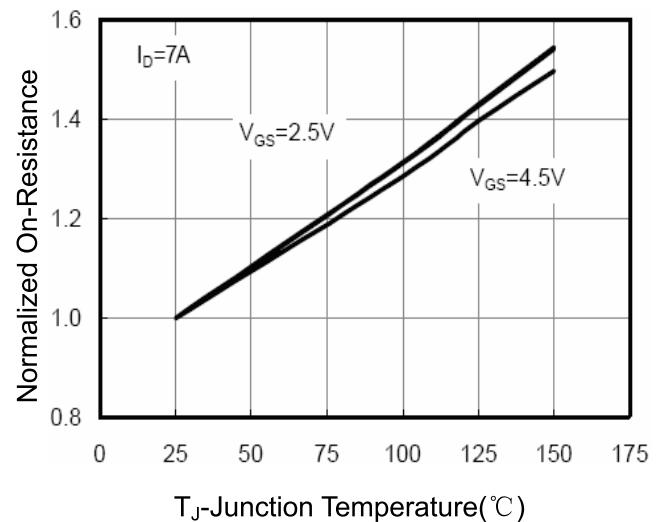


Figure 8 Drain-Source On-Resistance

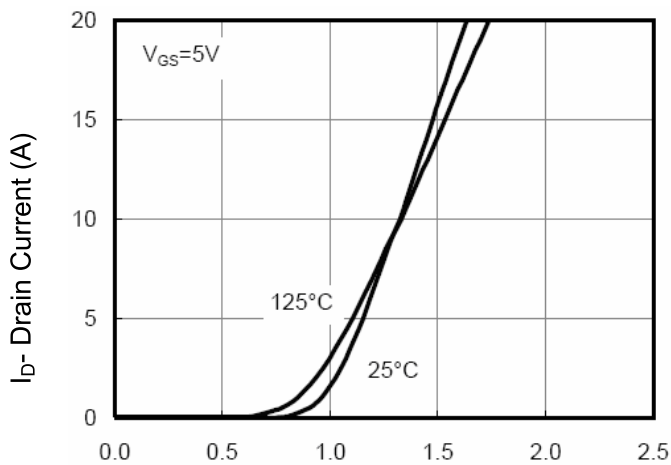


Figure 7 Transfer Characteristics

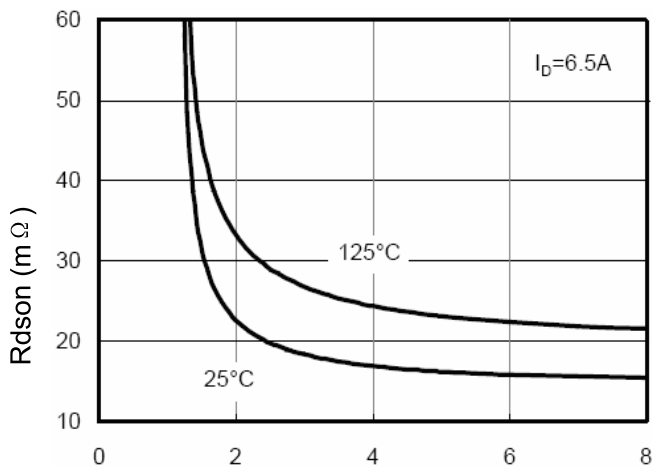


Figure 9 Rdson vs Vgs

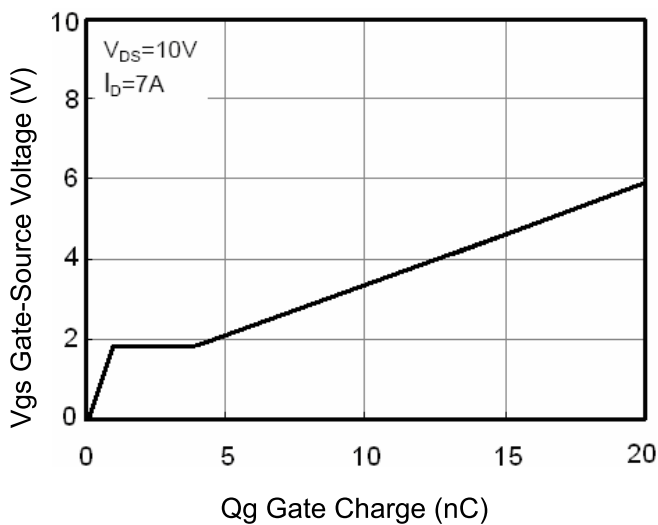


Figure 11 Gate Charge

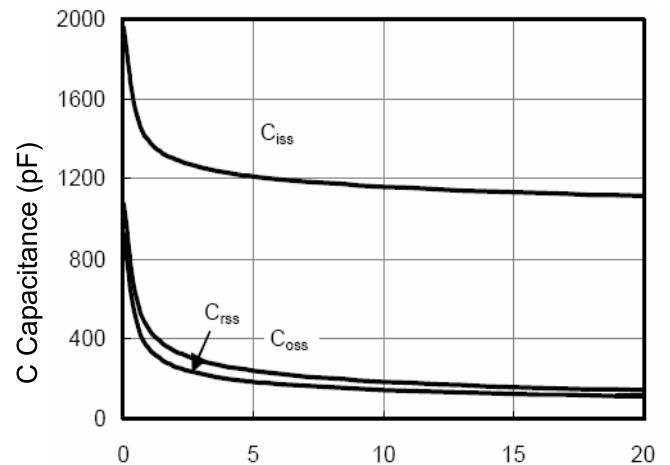


Figure 8 Capacitance vs Vds

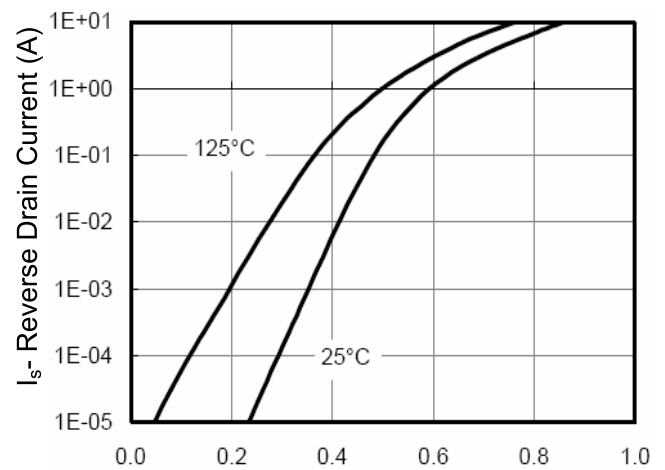


Figure 10 Capacitance vs Vds

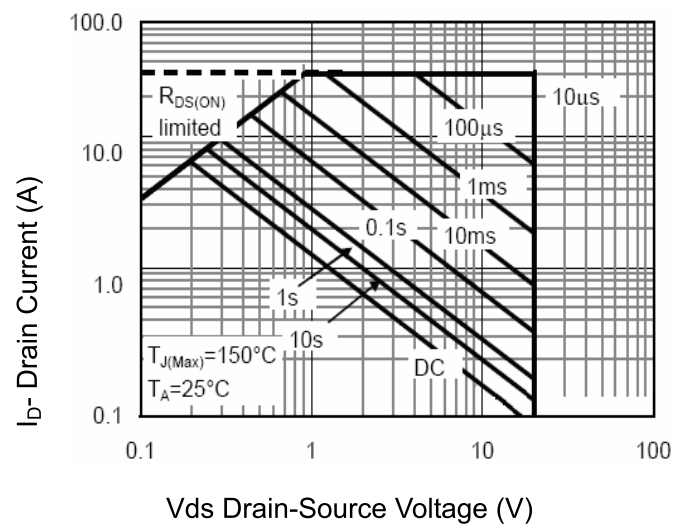


Figure 13 Safe Operation Area

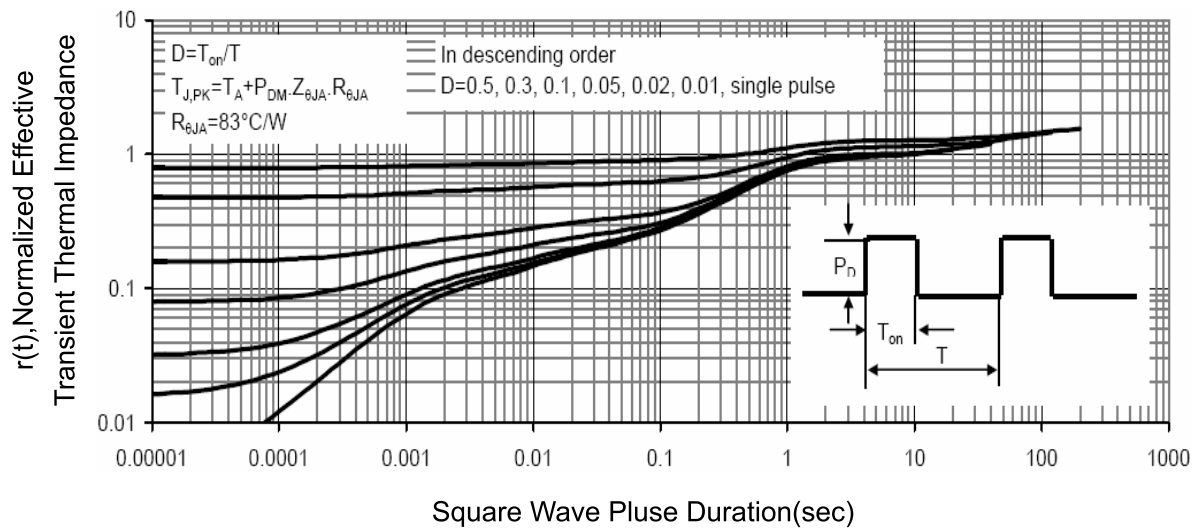
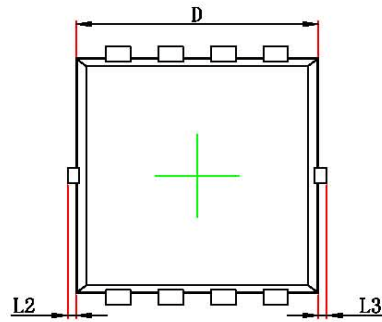
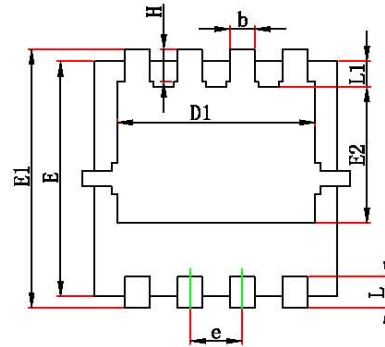


Figure 14 Normalized Maximum Transient Thermal Impedance

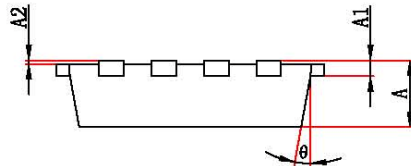
PDFNWB(3 × 3)-8L(P0.65T0.80) PACKAGE OUTLINE DIMENSIONS



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	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	2.300	2.600	0.091	0.102
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
e	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	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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