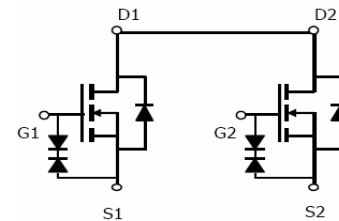


N-Channel Enhancement Mode Power MOSFET

Description

The FNK0203E-2 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. It is ESD protected.



Schematic diagram

General Features

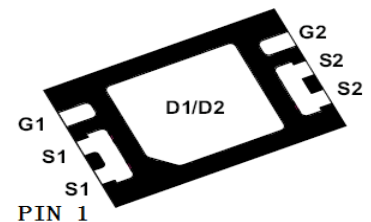
- $V_{DS} = 20V, I_D = 7A$
- $R_{DS(ON)} < 26 m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} < 22 m\Omega @ V_{GS}=4.5V$
- ESD Rating: 2200V HBM
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM application
- Load switch



Marking and pin Assignment



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}	± 10	V
Drain Current-Continuous	I_D	7	A
Drain Current-Pulsed (Note 1)	I_{DM}	30	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	0.55	0.7	0.95	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6.5A	-	15	22	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	20	26	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	-	970	-	PF
Output Capacitance	C _{OSS}		-	160	-	PF
Reverse Transfer Capacitance	C _{rss}		-	130	-	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

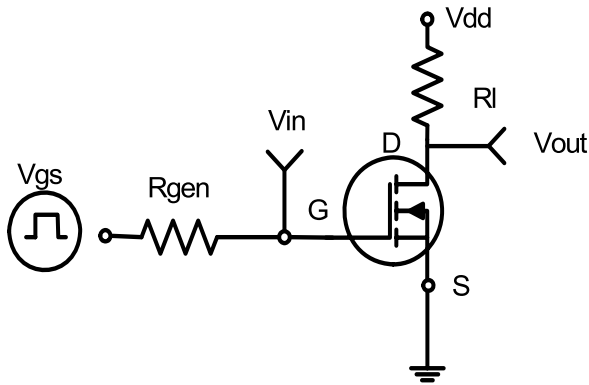


Figure 1: Switching Test Circuit

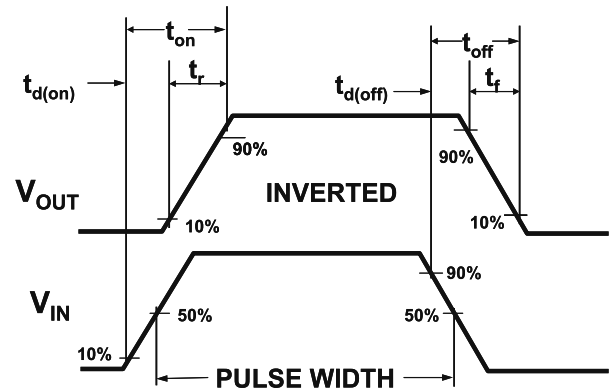


Figure 2: Switching Waveforms

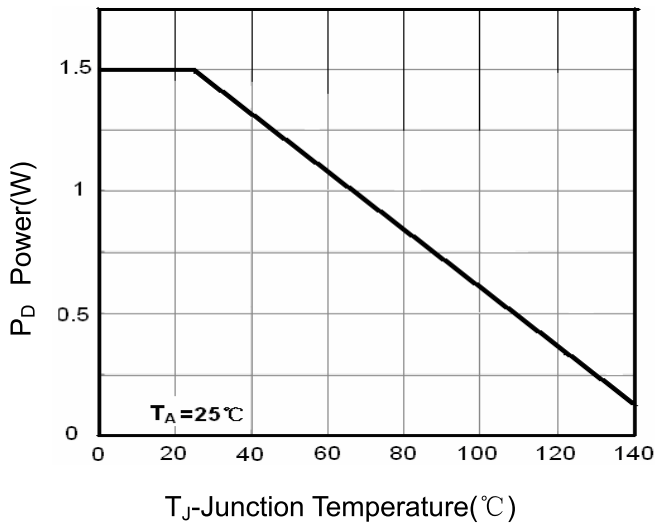


Figure 3 Power Dissipation

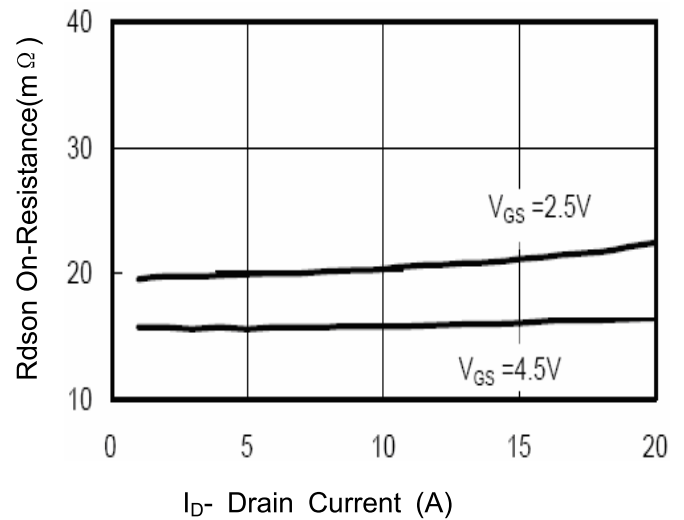


Figure 6 Drain-Source On-Resistance

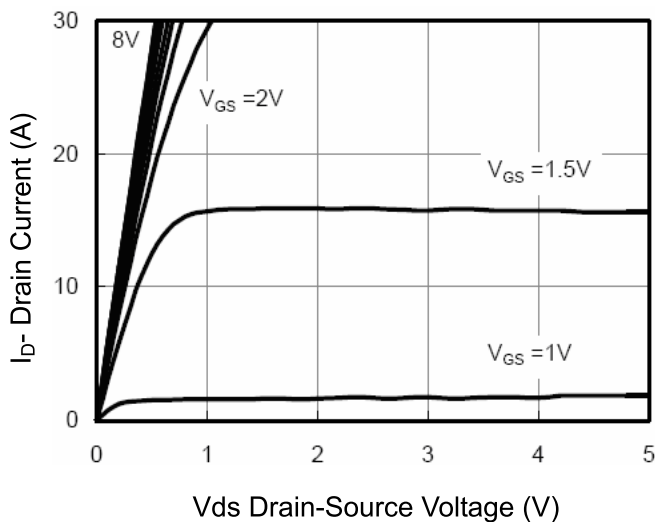


Figure 5 Output CHARACTERISTICS

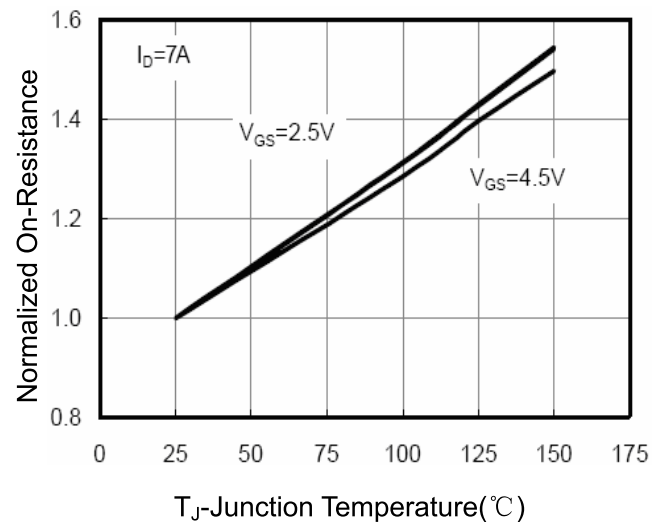


Figure 8 Drain-Source On-Resistance

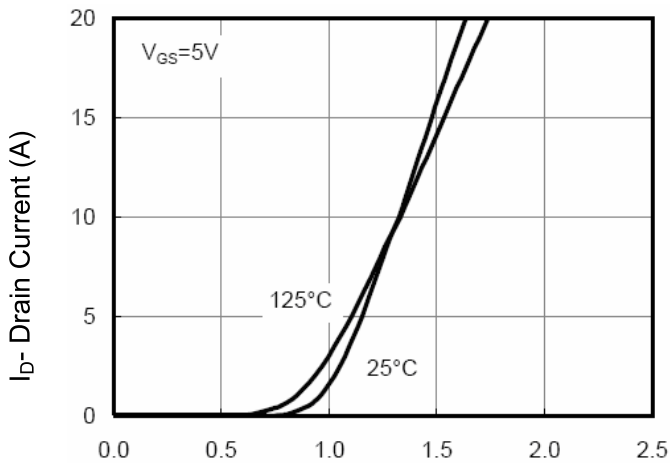


Figure 7 Transfer Characteristics

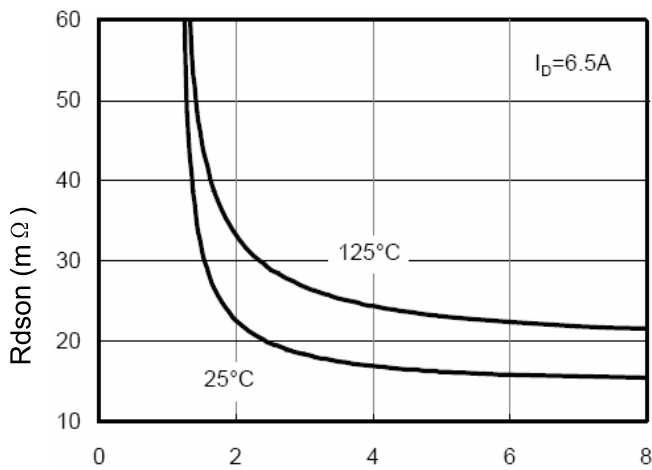


Figure 9 $R_{DS(on)}$ vs V_{GS}

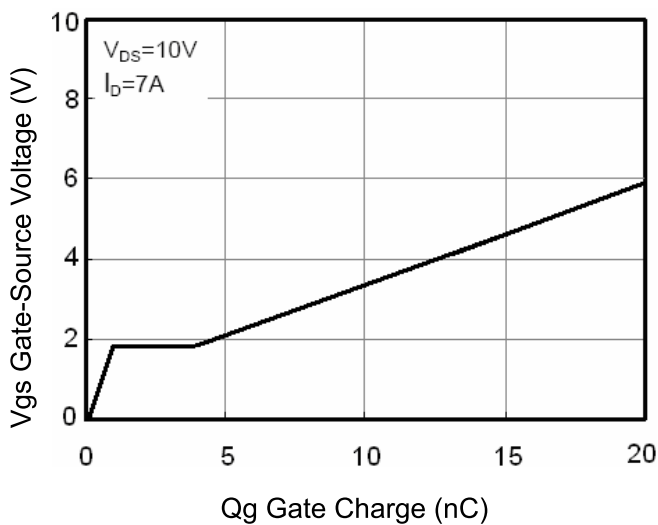


Figure 11 Gate Charge

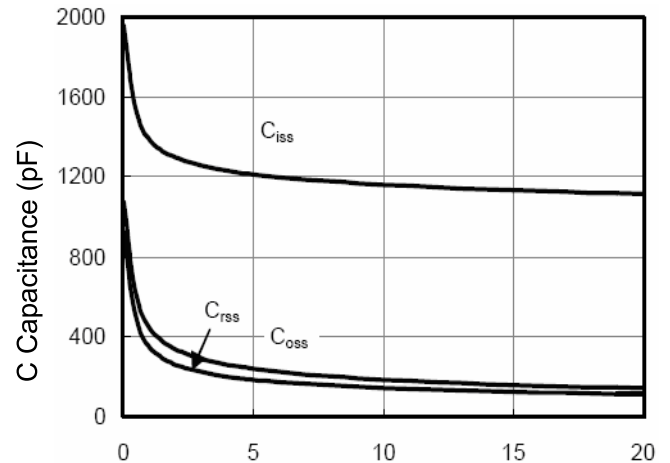


Figure 8 Capacitance vs V_{DS}

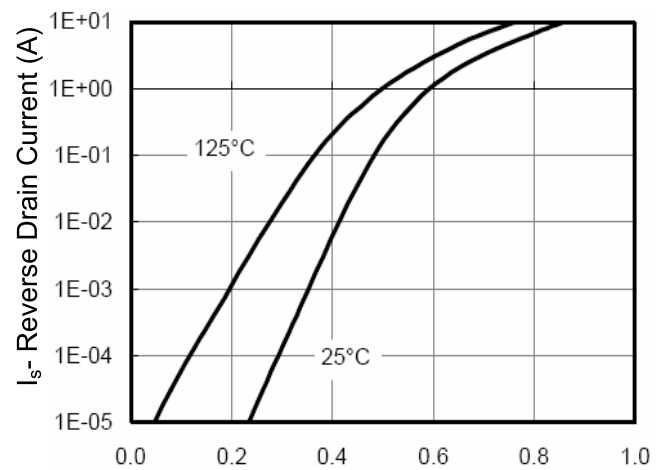


Figure 10 Capacitance vs V_{DS}

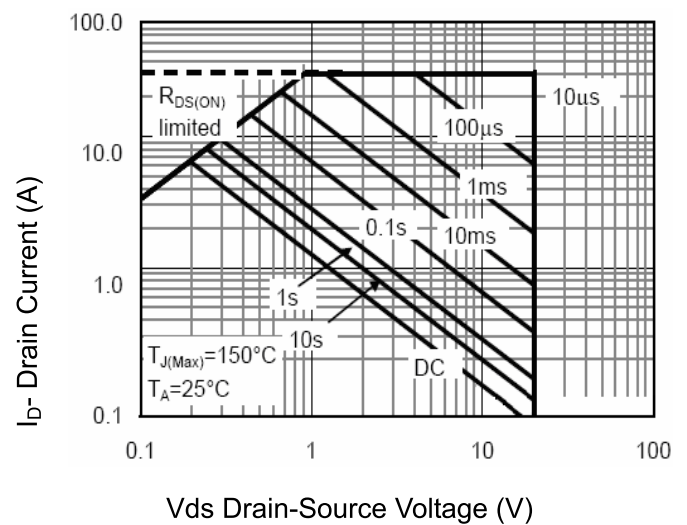


Figure 13 Safe Operation Area

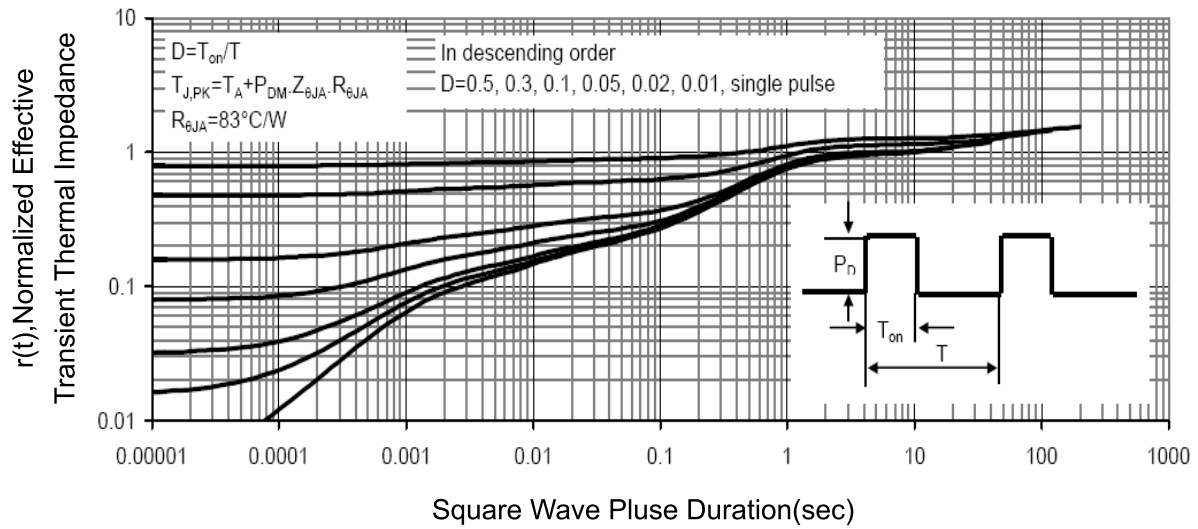


Figure 14 Normalized Maximum Transient Thermal Impedance

封装外形尺寸图

单位: mm				
符号	MIN	NOM	MAX	
A	1.95	2.00	2.05	
B	2.95	3.00	3.05	
C	1.45	1.50	1.55	
D	1.65	1.70	1.75	
E	0.33	0.38	0.43	
F	0.25	0.30	0.35	
G	0.20	0.25	0.30	
H	0.35	0.40	0.45	
I	0.2 BSC			
J	0.75	0.80	0.85	
J1	0-0.05			
K	0.3×45° BSC			
L	0.5 BSC			
M	0.70	0.75	0.80	
N	0.10	0.15	0.20	

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