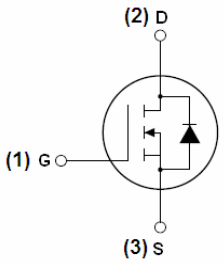
FNK N-Channel Enhancement Mode Power MOSFET

Description

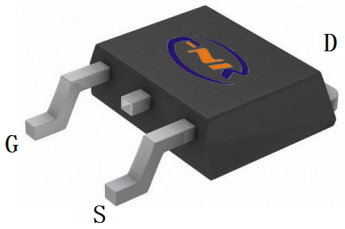
The FNK65N07D uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.



Schematic diagram

General Features

- V_{DS} =65V,I_D =85A
  $R_{DS(ON)}$ < 7.7mΩ @ V_{GS}=10V (Typ:6.3mΩ)
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



To-263 Top View

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
FNK65N07D	FNK65N07D	**TO-263**	-	-	-

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	VDS	65	V
Gate-Source Voltage	VGS	±25	V
Drain Current-Continuous	ID	85	A
Drain Current-Continuous(TC=100℃)	ID (100℃)	66	A
Pulsed Drain Current	IDM	340	A
Maximum Power Dissipation	PD	150	W
Derating factor		1	W/℃
Single pulse avalanche energy (Note 5)	EAS	175	mJ
Operating Junction and Storage Temperature Range	TJ,TSTG	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case(Note 2)	RθJC	1	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

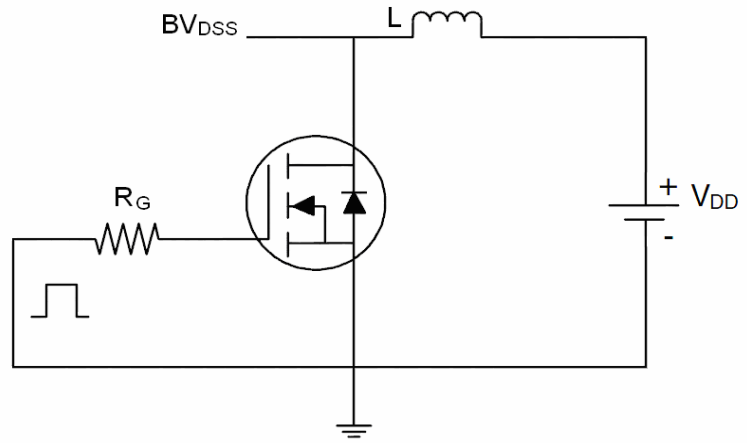
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BVDSS	VGS=0V ID=250μA	65	69	-	V
Zero Gate Voltage Drain Current	IDSS	VDS=65V,VGS=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	VGS(th)	VDS=VGS,ID=250μA	2.3	3.4	3.8	V
Drain-Source On-State Resistance	RDS(ON)	VGS=10V, ID=8A	-	6.3	7.7	mΩ
Forward Transconductance	gFS	VDS=25V,ID=30A	50	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	Clss	VDS=30V,VGS=0V, F=1.0MHz	-	4300	-	PF
Output Capacitance	Coss		-	360	-	PF
Reverse Transfer Capacitance	Crss		-	309	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	td(on)	VDD=30V,ID=2A,RL=15Ω VGS=10V,RG=2.5Ω	-	15	-	nS
Turn-on Rise Time	tr		-	11	-	nS
Turn-Off Delay Time	td(off)		-	52	-	nS
Turn-Off Fall Time	tf		-	13	-	nS
Total Gate Charge	Qg	VDS=30V,ID=30A, VGS=10V	-	94	-	nC
Gate-Source Charge	Qgs		-	16	-	nC
Gate-Drain Charge	Qgd		-	24	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	VSD	VGS=0V,IS=30A	-	-	1.2	V
Diode Forward Current (Note 2)	IS		-	-	78	A
Reverse Recovery Time	trr	TJ = 25°C, IF =75A di/dt = 100A/μs(Note3)	-	33		nS
Reverse Recovery Charge	Qrr		-	54		nC

Notes:

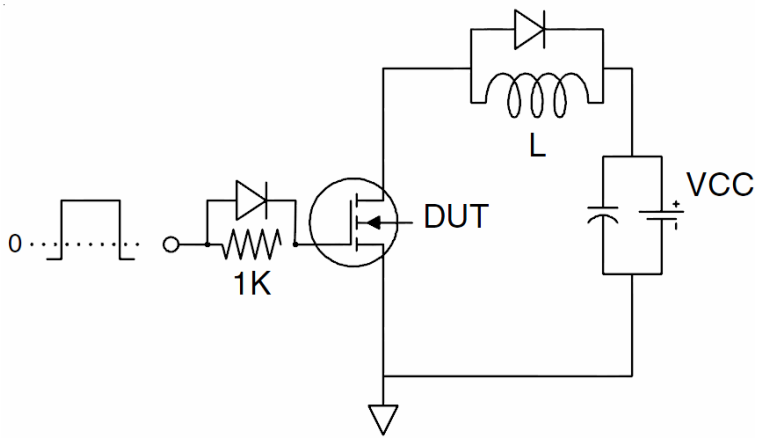
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition:Tj=25℃,V_{DD}=35V,V_G=10V,L=0.5mH,Rg=25Ω

Test Circuit

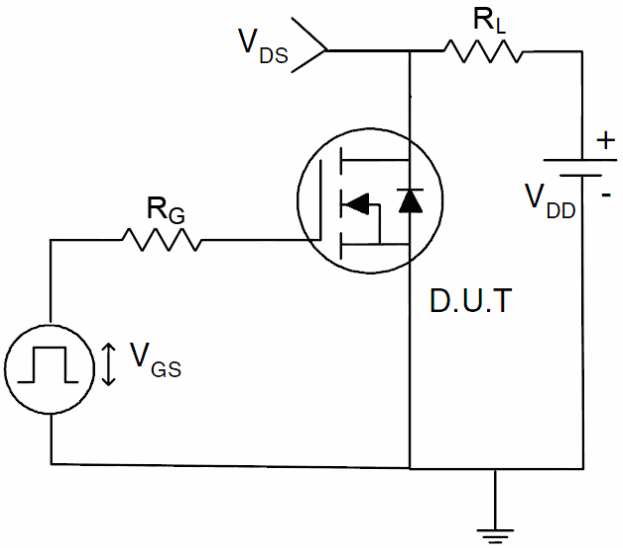
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

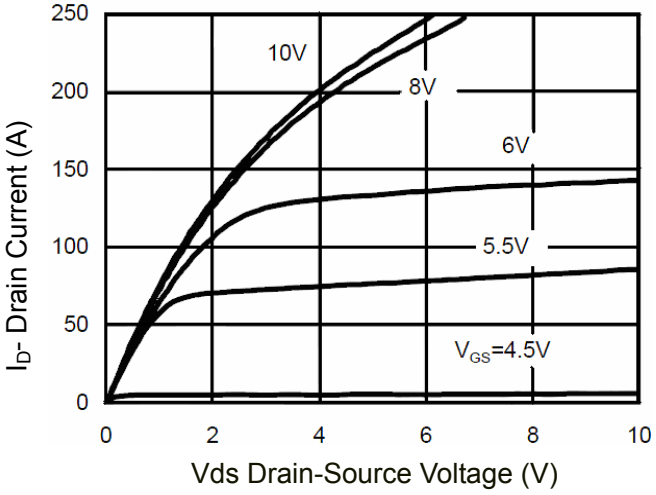


Figure 1 Output Characteristics

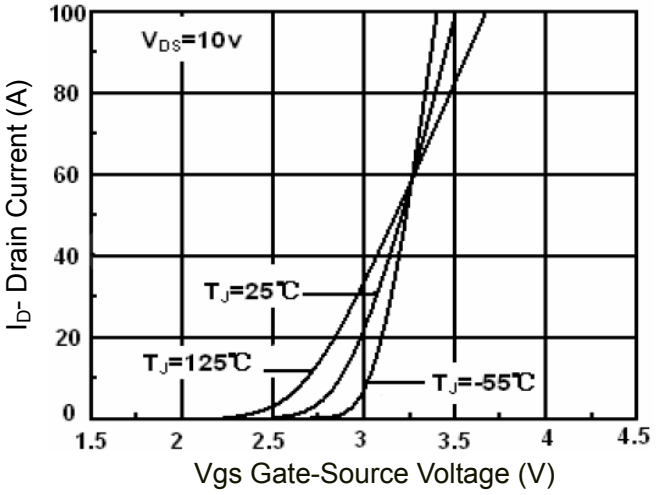


Figure 2 Transfer Characteristics

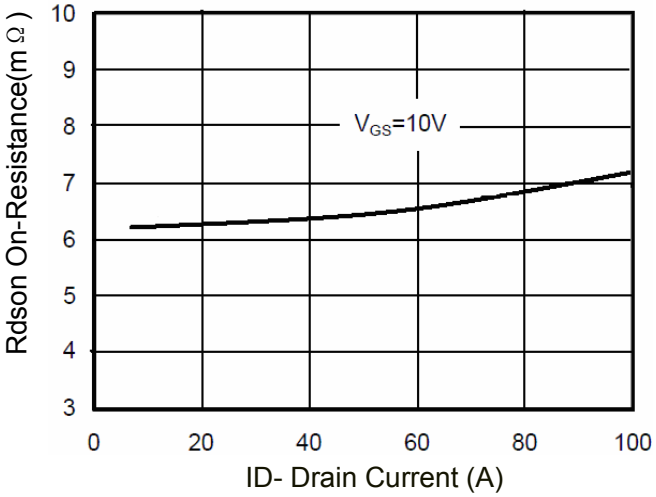


Figure 3 Rdson- Drain Current

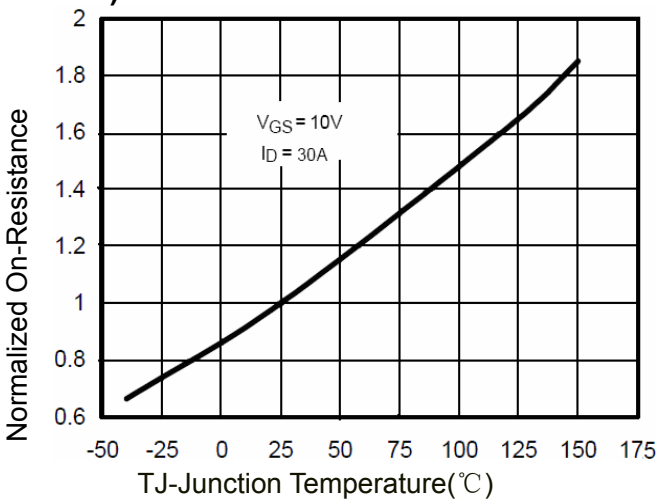


Figure 4 Rdson-JunctionTemperature

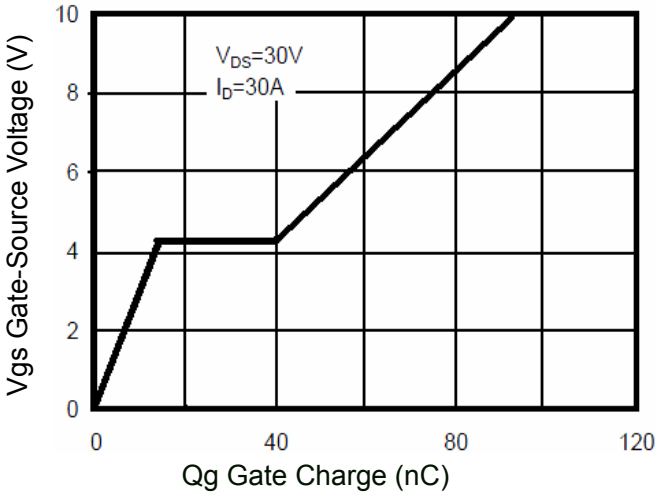


Figure 5 Gate Charge

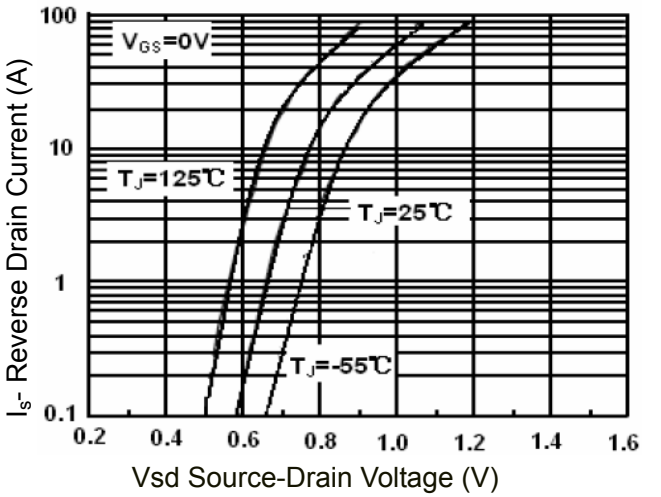


Figure 6 Source- Drain Diode Forward

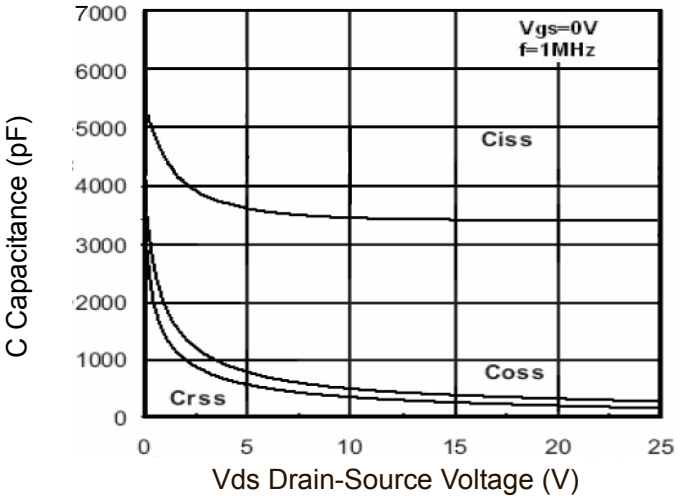


Figure 7 Capacitance vs Vds

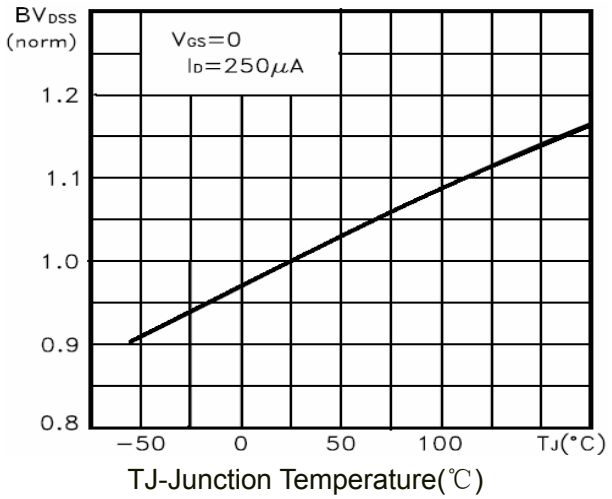


Figure 9 BV_{DSS} vs Junction Temperature

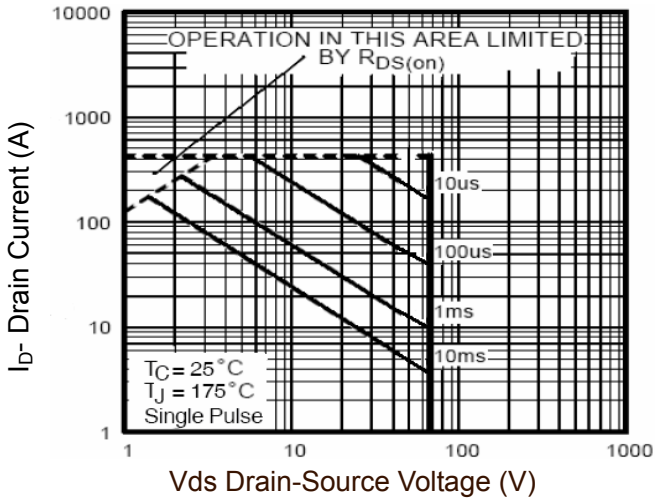


Figure 8 Safe Operation Area

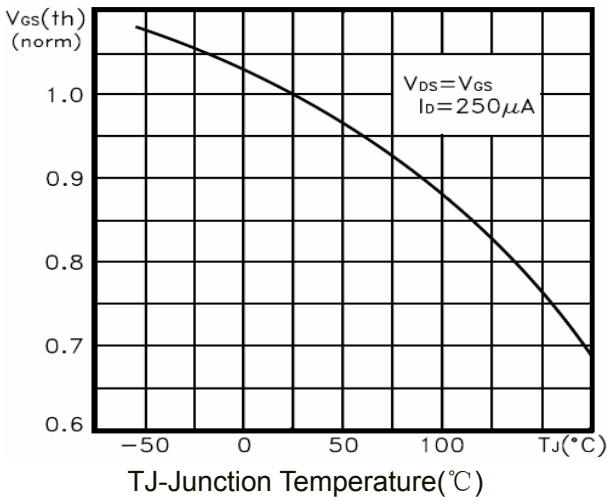


Figure 10 $V_{GS(th)}$ vs Junction Temperature

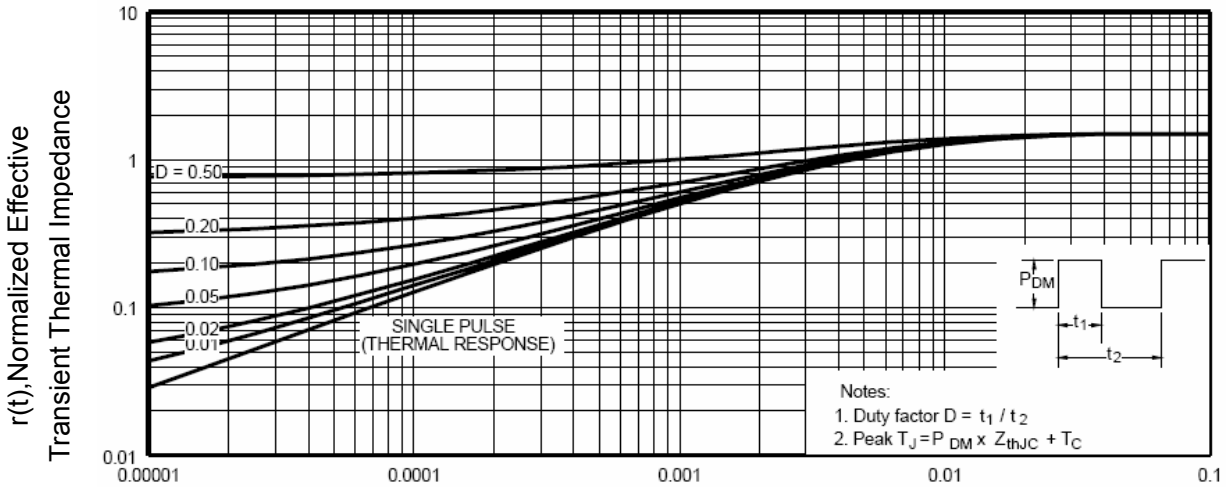
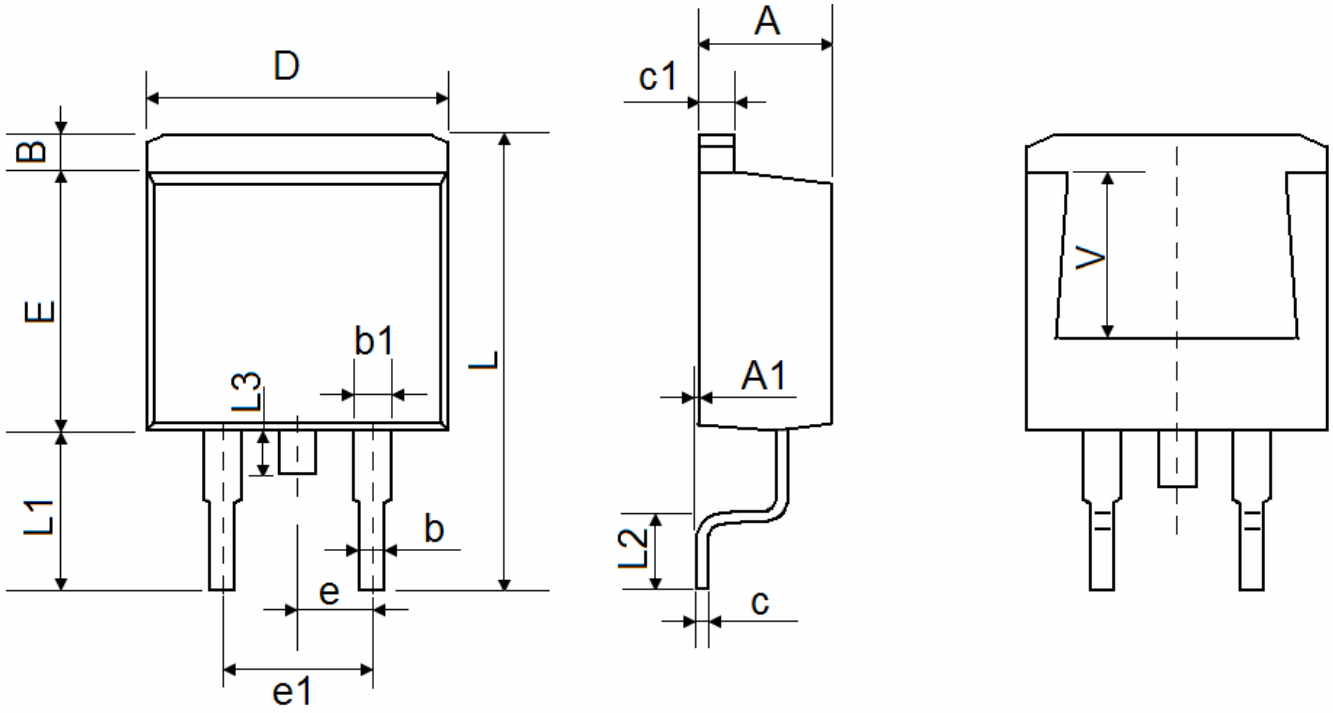


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	

Disclaimer:

- **FNK reserves the right to make changes to the information herein for the improvement of the design and performance without further notice! Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current.**
- **All semiconductor products malfunction or fail with some probability under special conditions. When using FNK products in system design or complete machine manufacturing, it is the responsibility of the buyer to comply with the safety standards strictly and take essential measures to avoid situations in which a malfunction or failure of such Silan products could cause loss of body injury or damage to property.**
- **FNK will supply the best possible product for customers!**