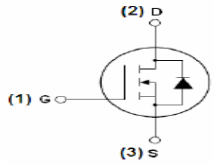
FNK01N15D

FNK N-Channel Enhancement Mode Power MOSFET

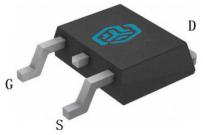
Description

The FNK01N15D 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

Marking and pin Assignment



TO-263 top view

General Features

- V_{DS} = 100V,I_D =150A
  $R_{DS(ON)}$ <5.7mΩ @ V_{GS}=10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Good stability and uniformity with high EAS

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
FNK01N15D	FNK01N15D	TO-263	-	-	-

ABSOLUTE MAXIMUM RATINGS(TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D(25℃)	150	A
	I_{DM}	600	A
Maximum Power Dissipation	P_D	375	W
Single pulse avalanche energy(Note 5)	EAS	433	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	0.4	℃/W

ELECTRICAL CHARACTERISTICS (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						

Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	110		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	2.8	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		5.0	5.7	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	70			S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz		6470		PF
Output Capacitance	C_{oss}			690		PF
Reverse Transfer Capacitance	C_{rss}			430		PF
SWITCHING CHARACTERISTICS (Note 4)						
Delay Time	$t_{d(on)}$	V_{DD}=50V,V_{GS}=10V,R_{GEN}=3Ω I_D=2A RL=2.5Ω		28		nS
Turn-on Rise Time	t_r			22		nS
Turn-Off Delay Time	$t_{d(off)}$			43.5		nS
Turn-Off Fall Time	t_f			14.5		nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=20A,V_{GS}=10V		139		nC
Gate-Source Charge	Q_{gs}			34		nC
Gate-Drain Charge	Q_{gd}			56		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=20A		0.85	1.2	V
Diode Forward Current (Note 2)	Is				160	A
Reverse Recovery Time	trr	TJ = 25℃, IF = 20A di/dt = 500A/us(Note3)		60	90	nS
Reverse Recovery Charge	Qrr			177	200	nC

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on 1in^2 FR4 Board, t ≤ 10 sec.

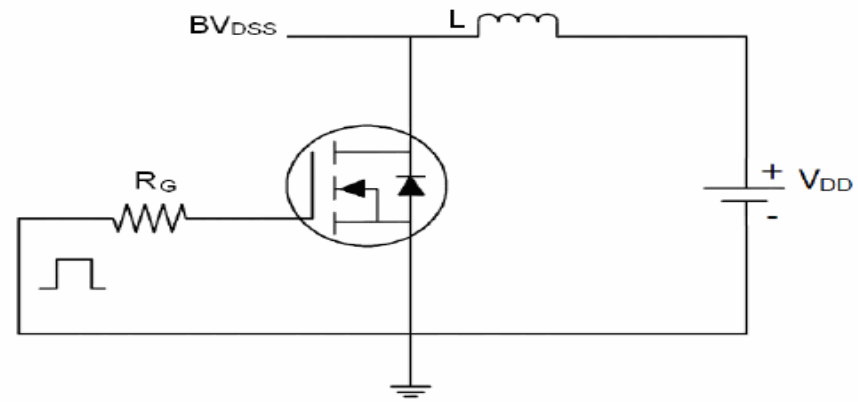
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production testing

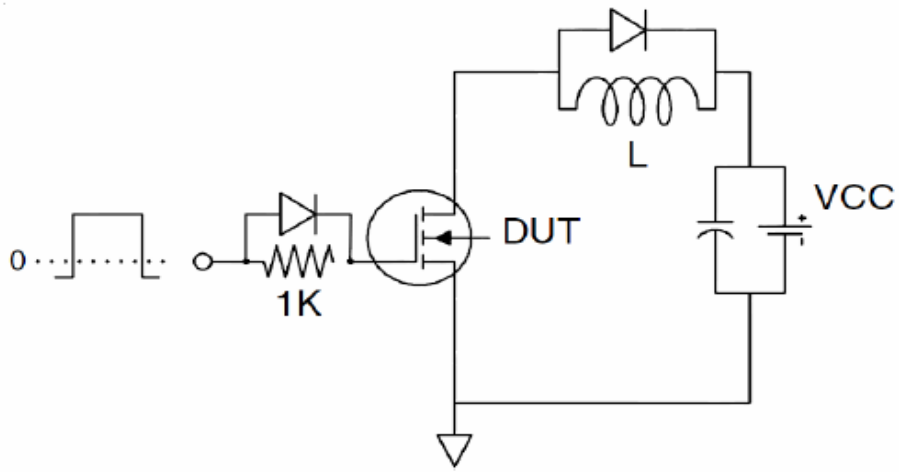
5.EAS condation:Tj=25℃,Vdd=20V.Vg=10V,L=0.5mH,Rg=25Ω

Test circuit

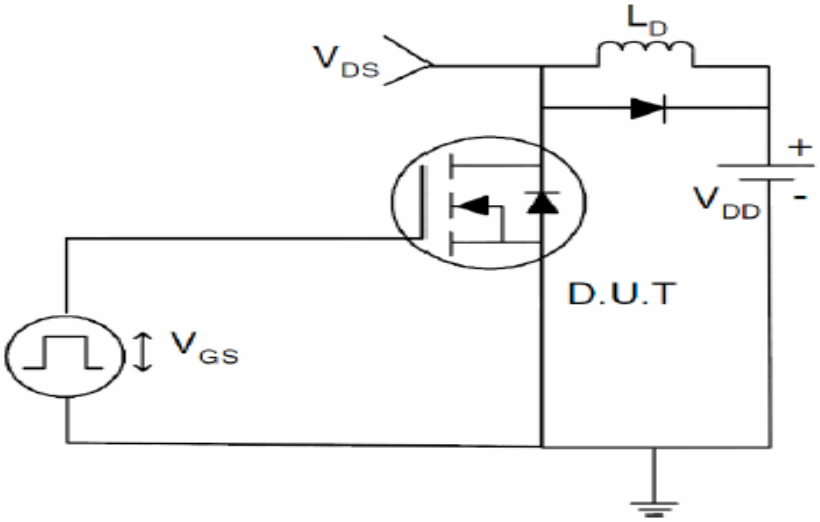
1) EAS Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

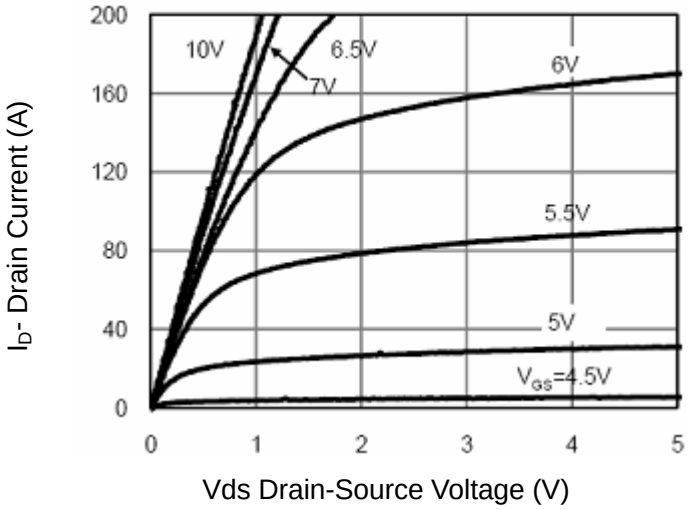


Figure 1 Output Characteristics

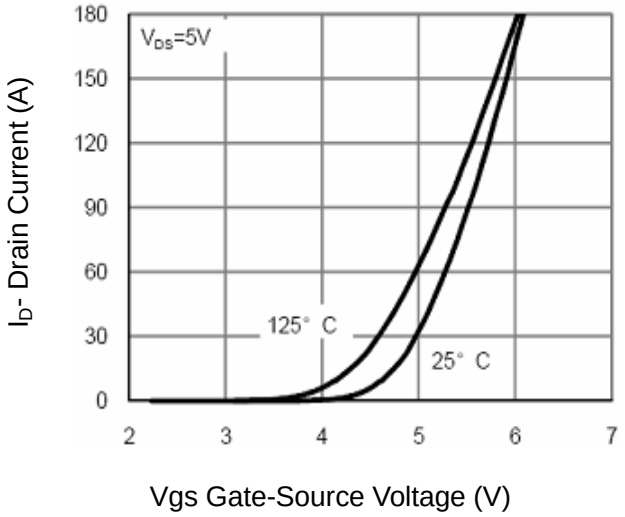


Figure 2 Transfer Characteristics

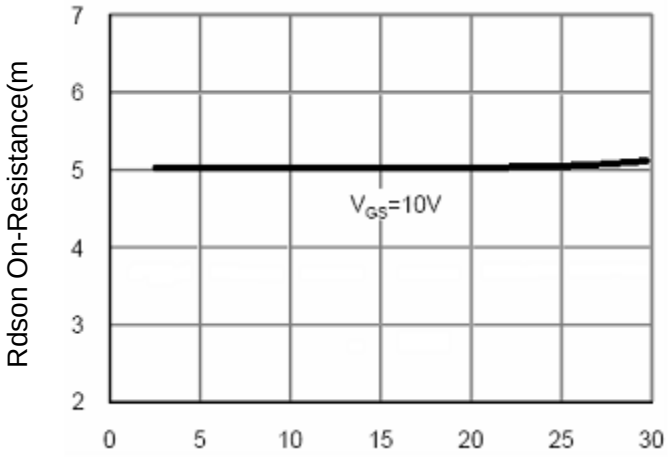


Figure 3 Rdson-Drain Current

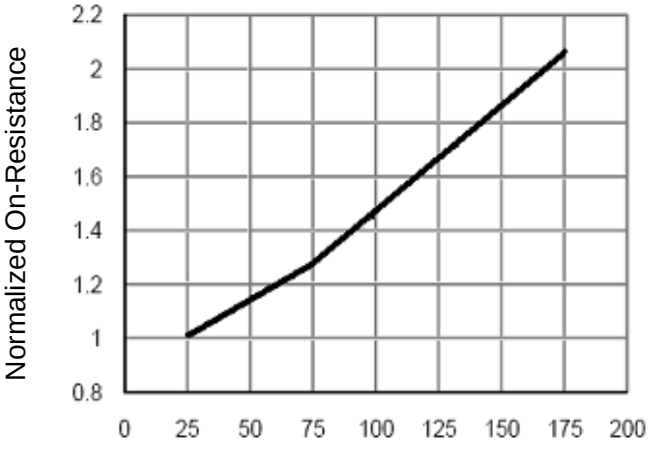


Figure 4 Rdson-JunctionTemperature

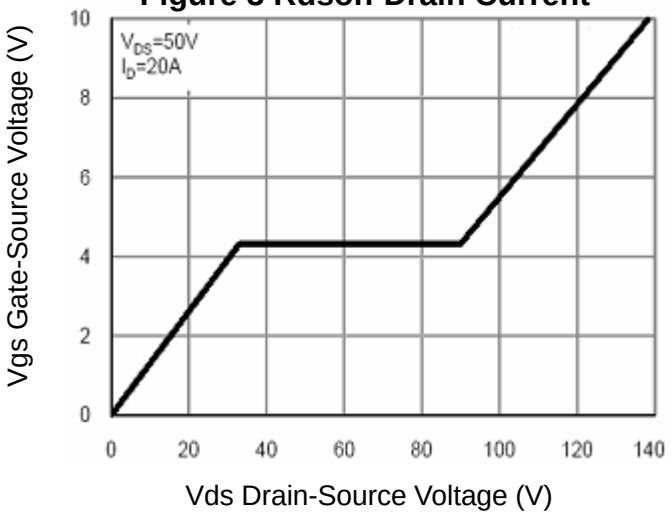


Figure 5 Output CHARACTERISTICS

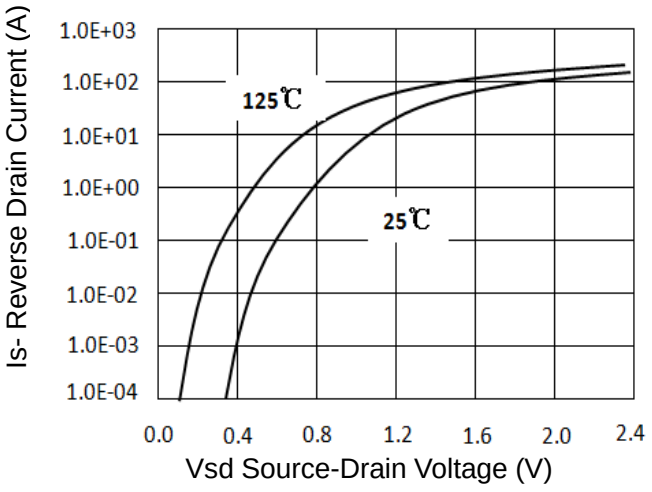


Figure 6 Source- Drain Diode Forward

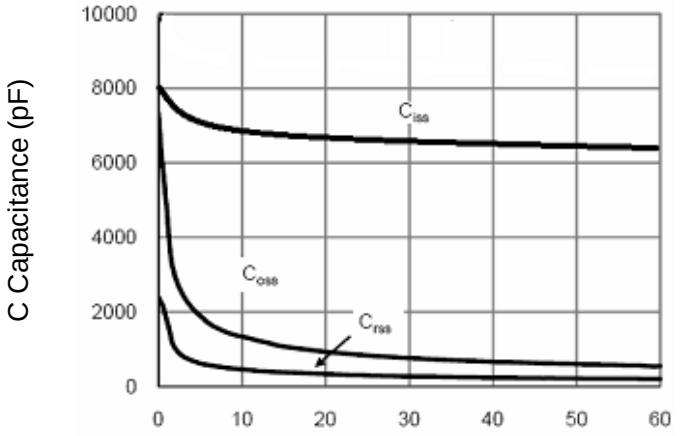


Figure 7 Capacitance vs Vds

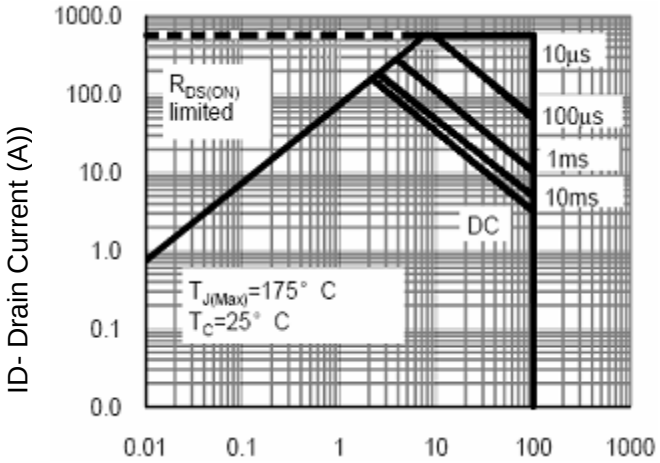


Figure 8 Safe Operation Area

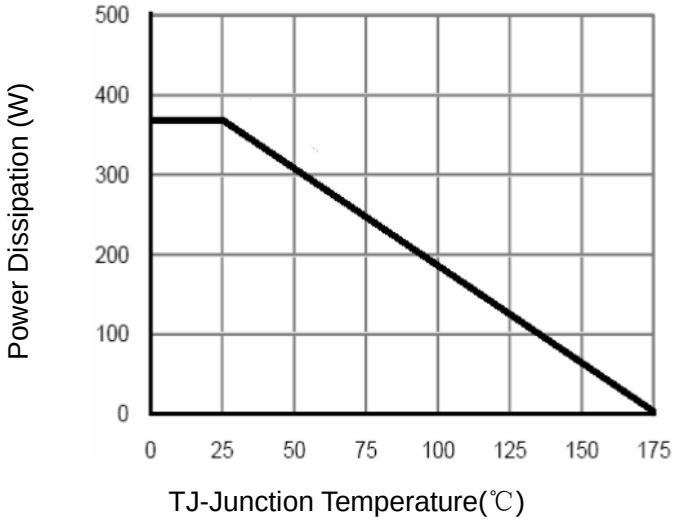


Figure 9 Power De-rating

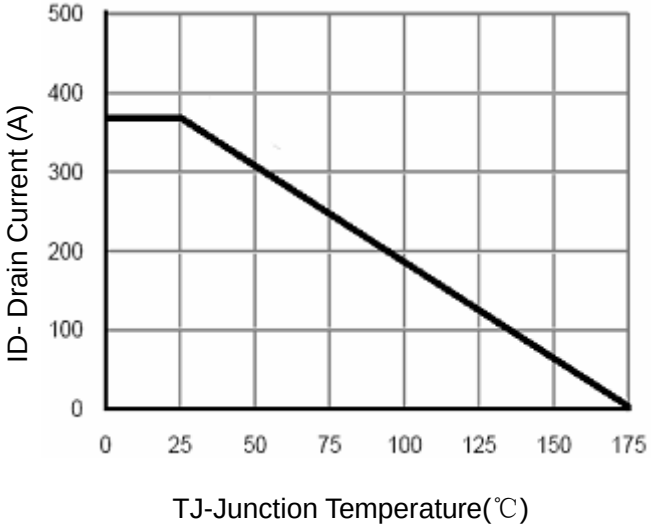


Figure 10 Current De-rating

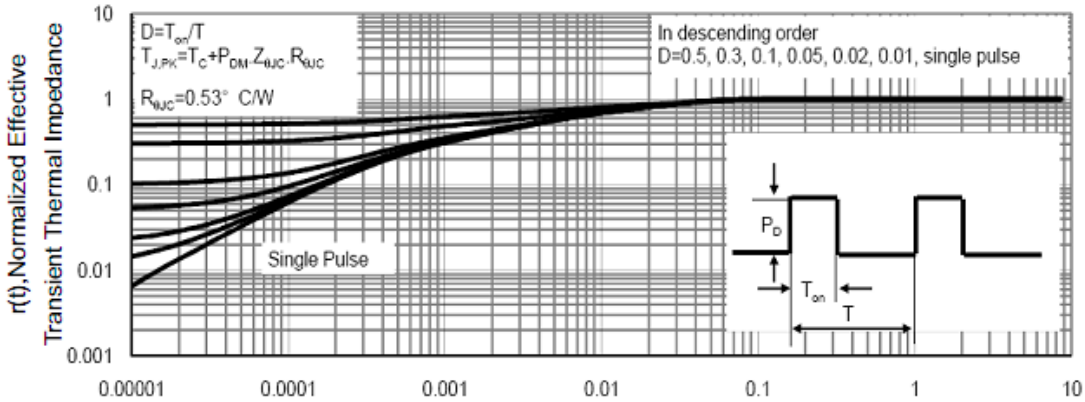
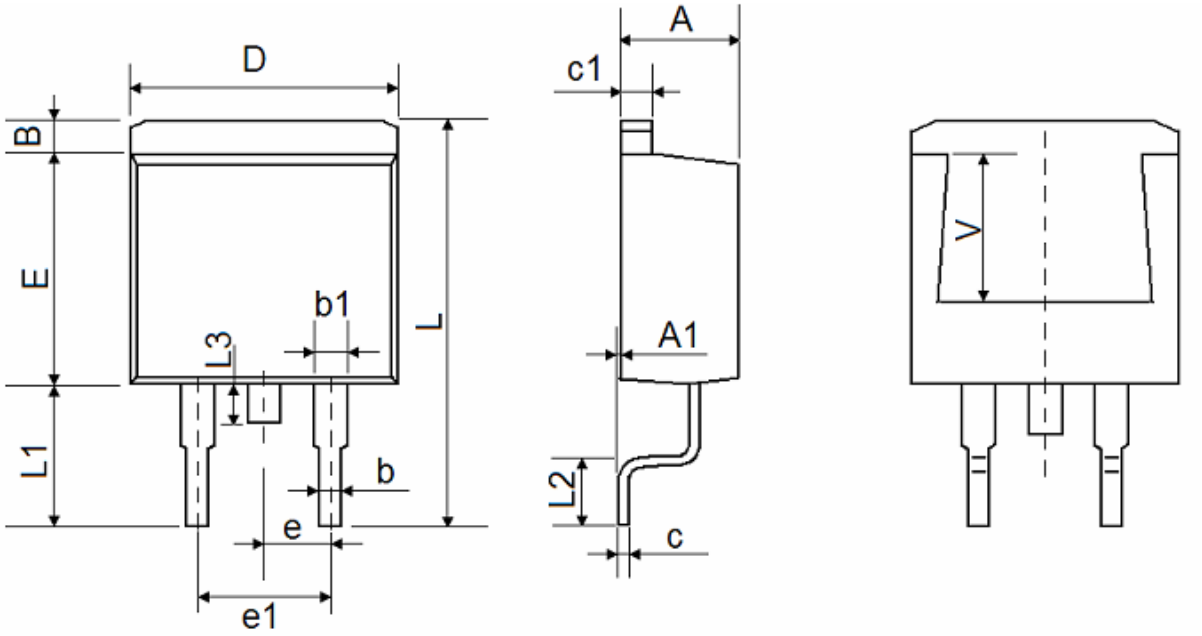


Figure 11 Normalized Maximum Transient Thermal Impedance

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	

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