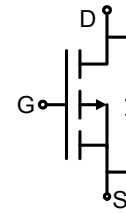# FNK P-Channel Enhancement Mode Power MOSFET
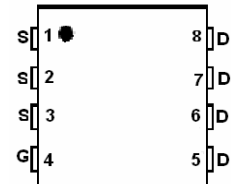
Description

The FNK3035P 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.

General Features

- V_{DS} =-30V, I_D=-35A
  $R_{DS(ON)}$ < 10 mΩ @ V_{GS}=-10V

- 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
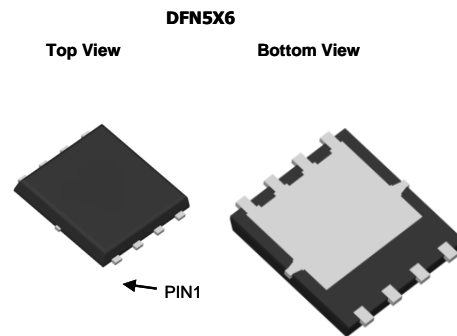- Special process technology for high ESD capability

Application

- Battery and loading switching

Schematic diagram

Marking and pin assignment

DFN5X6
Top View   Bottom View

PIN1

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
FNK3035P	FNK3035P	DFN 5x6 -8L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-35	A
Pulsed Drain Current	I_{DM}	-100	A
Maximum Power Dissipation	P_D	35	W
Derating factor		0. 28	W/℃
Single pulse avalanche energy [Note 5]	E_{AS}	180	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case[Note 2]	$R_{\theta JC}$	3.6	℃/W

Electrical Characteristics (TC=25℃ unless otherwise noted)

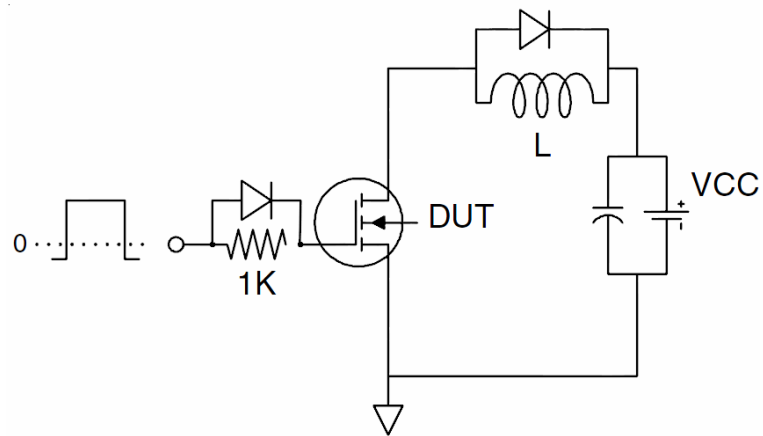| Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm20V, V_{DS}=0V$	-	-	±100	nA
On Characteristics [Note 3]						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-10A$	-	7	9.2	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-15A$	-	20	-	S
Dynamic Characteristics [Note4]						
Input Capacitance	C_{Iss}	$V_{DS}=-15V, V_{GS}=0V,$ F=1.0MHz	-	3340	-	PF
Output Capacitance	C_{oss}		-	695	-	PF
Reverse Transfer Capacitance	C_{rss}		-	632	-	PF
Switching Characteristics [Note 4]						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-10A$ $V_{GS}=-10V, R_{GEN}=6\Omega$	-	13	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	48	-	nS
Turn-Off Fall Time	t_f		-	14	-	nS
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-10A,$ $V_{GS}=-10V$	-	84	-	nC
Gate-Source Charge	Q_{gs}		-	11.9	-	nC
Gate-Drain Charge	Q_{gd}		-	25	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage [Note 3]	V_{SD}	$V_{GS}=0V, I_S=-10A$	-	-0.85	-1.2	V
Diode Forward Current [Note 2]	I_S		-	-	-50	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = -10A di/dt = 100A/μs(Note3)	-	-	49	nS
Reverse Recovery Charge	Qrr		-	-	43	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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}=-15V, V_G=-10V, L=0.5mH, Rg=25Ω
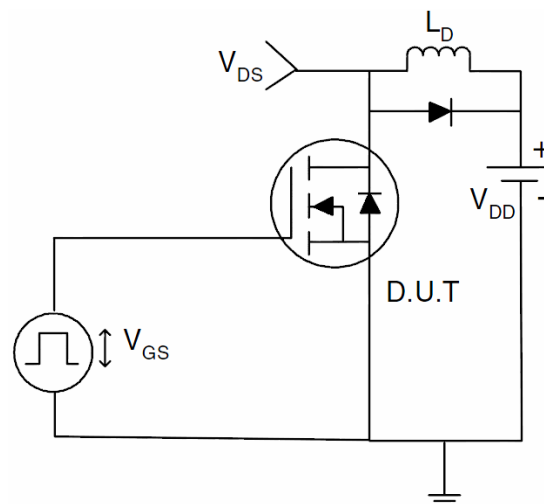
Test Circuit

1) E$_{AS}$ Test Circuits

2) Gate Charge Test Circuit

3) Switch Time Test Circuit

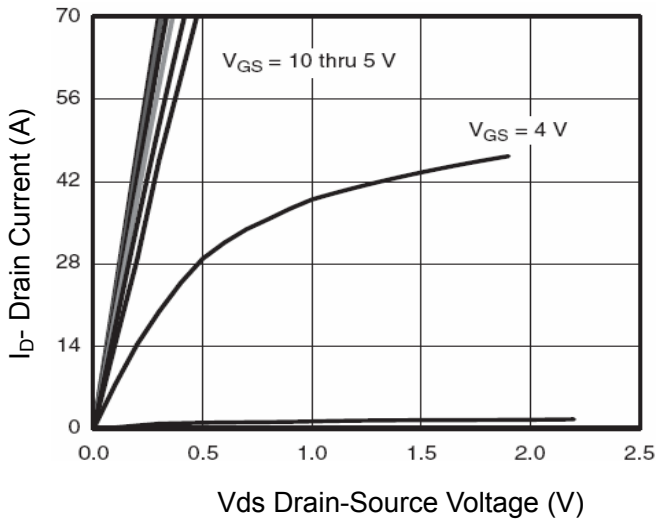## Typical Electrical and Thermal Characteristics (Curves)
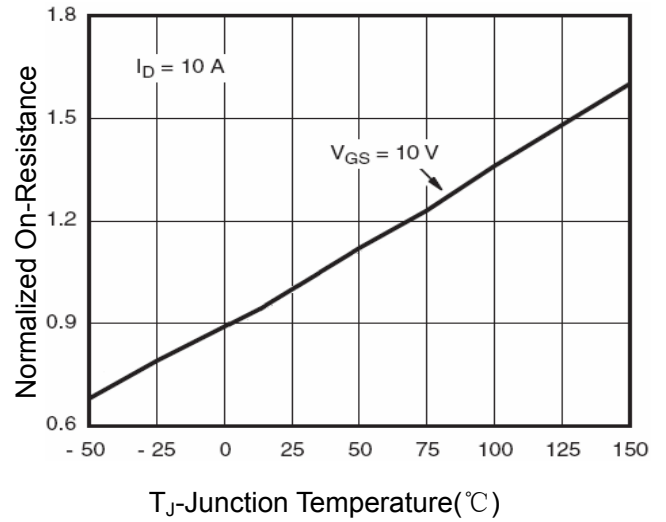
Figure 1 Output Characteristics
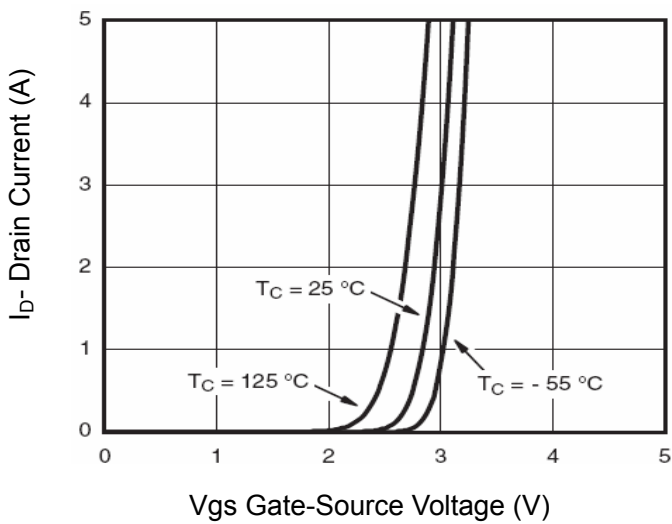
Figure 4 Rdson-Junction Temperature

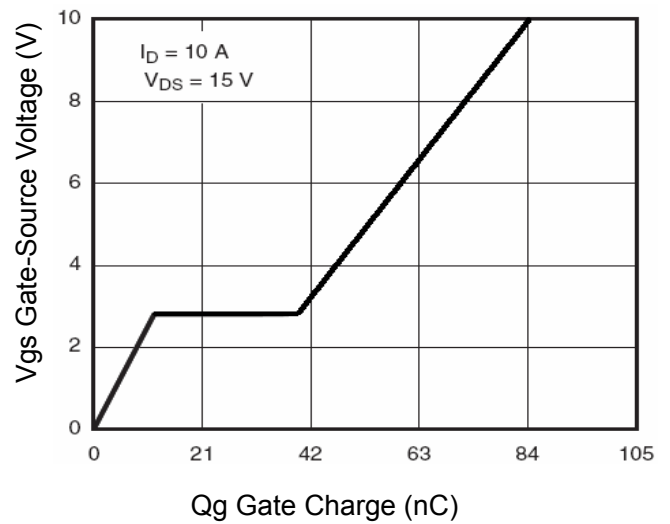**Figure 2 Transfer Characteristics**
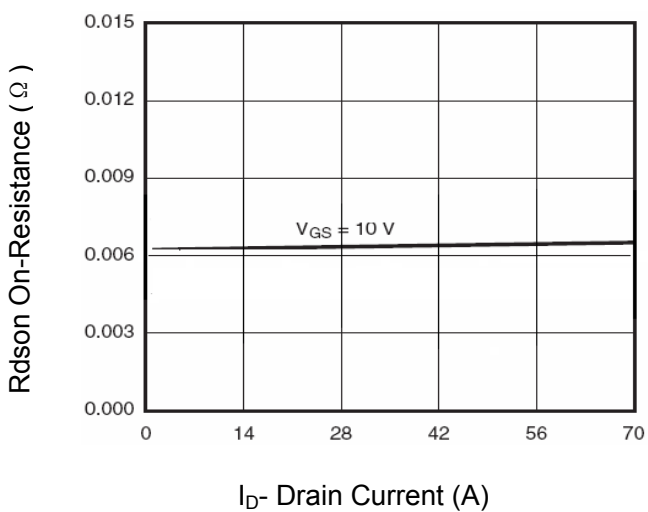
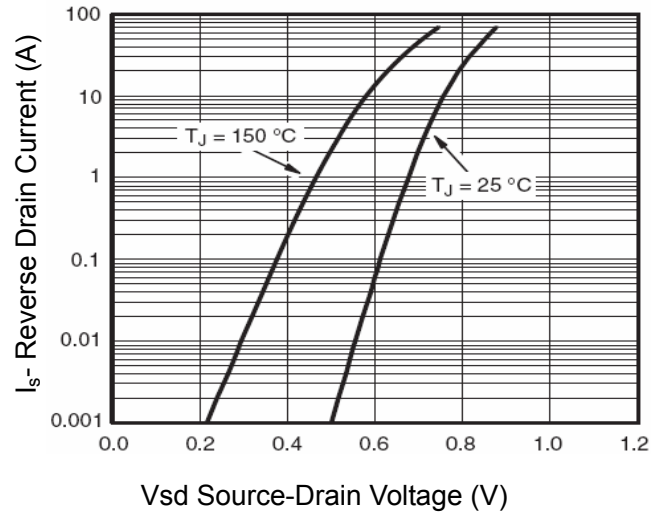**Figure 5 Gate Charge**

Figure 3 Rdson- Drain Current
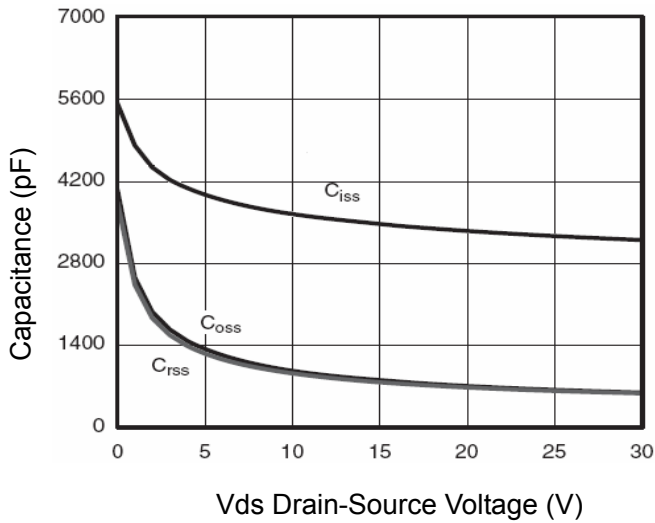
Figure 6 Source- Drain Diode Forward
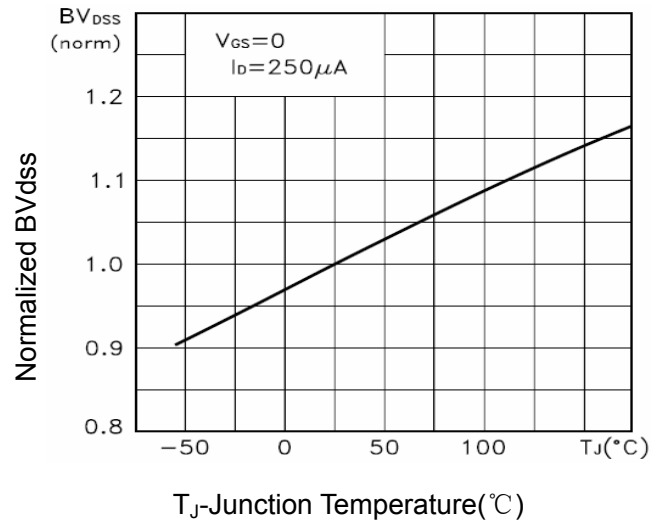
Figure 7 Capacitance vs Vds
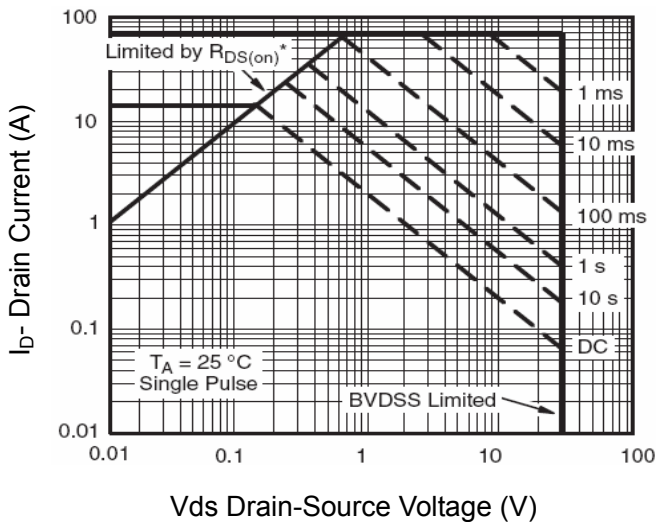
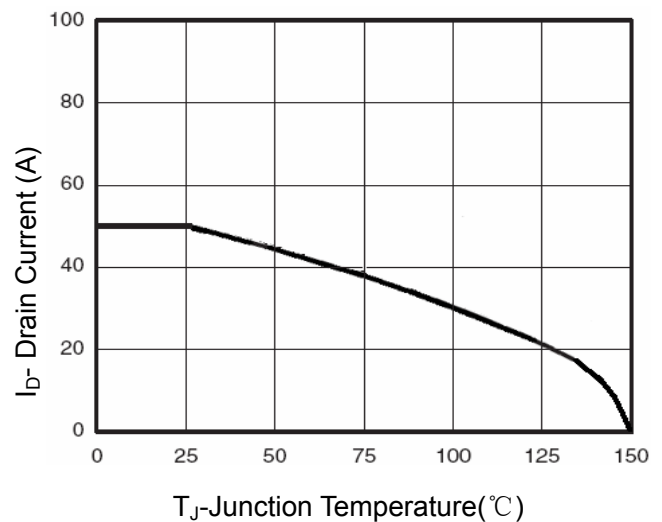Figure 9 BV$_{DSS}$ vs Junction Temperature

Figure 8 Safe Operation Area

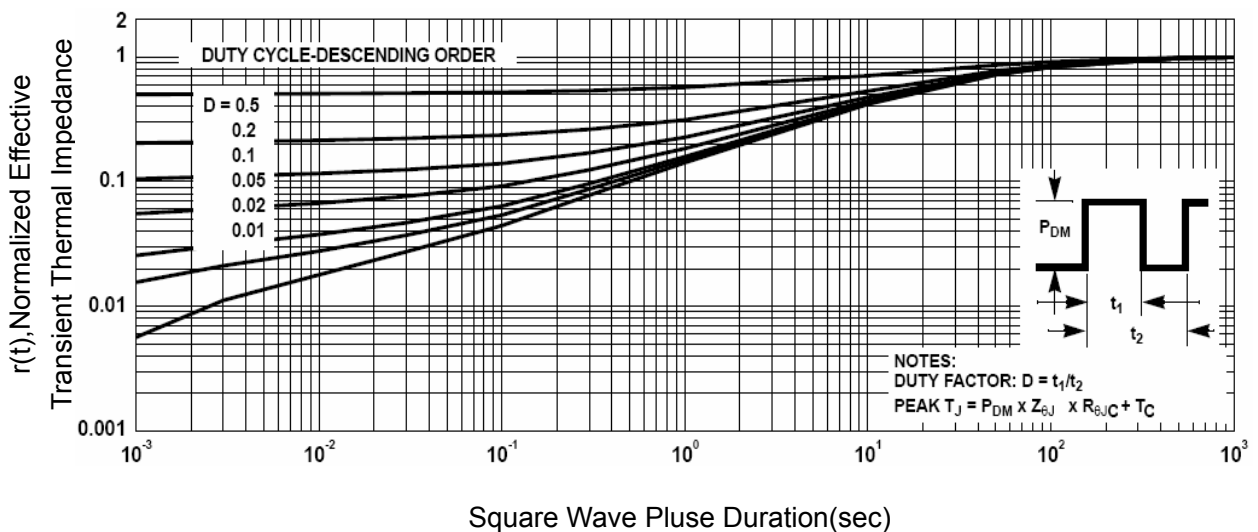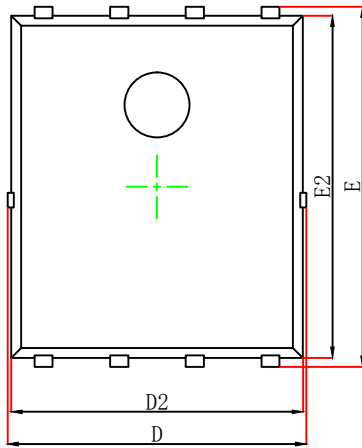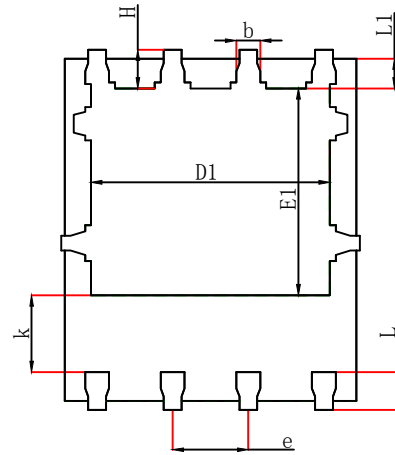Figure 10 ID Current Derating vs Junction Temperature
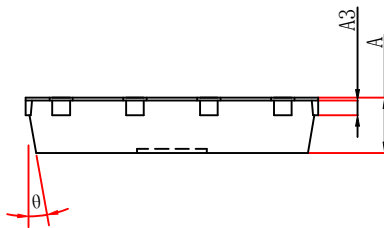
Figure 11 Normalized Maximum Transient Thermal Impedance

PDFNWB5×6-8L(P1.27T0.95) 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	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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