

YK130P04-D5

P-Channel Enhancement Mode Field Effect Transistor



康比電子
HORNBY ELECTRONIC

General Description

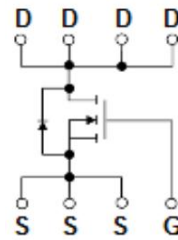
The YK130P04-D5 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is well suited for high current load applications.

Application

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

Features

- $V_{DS} = -40V, I_D = -49A$
 $R_{DS(ON)} < 20m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 13m\Omega @ V_{GS} = -10V$
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation



Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
130P04	YK130P04-D5	PDFN5×6-8L	5000 pcs / Tape & Reel

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DSS}	-40	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current-Continuous $V_{GS} = -4.5V$, @ $T_A = 25^\circ C$	I_D	-49	A
Pulsed Drain Current (Note 2、4)	I_{DM}	-268	A
Maximum Power Dissipation @ $T_A = 25^\circ C$	P_D	50	W
Single pulse avalanche energy (Note 3)	EAS	125	mJ
Operating Junction and Storage Temperature Range	T_J	-55 ~ +150	$^\circ C$

Thermal Characteristics

Thermal Resistance Junction-to-Air (Note1)	$R_{\theta JA}$	96	$^\circ C/W$
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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V,V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = -250μA	-1	-1.4	-2.5	V
Drain-Source On-State Resistance (Note 2)	R _{DS(ON)}	VGS = -10V,ID = -15A	-	-	13	mΩ
		VGS = -4.5V,ID = -10A	-	-	20	
Dynamic Characteristics						
Input Capacitance	C _{iss}	VGS = 0V VDS = -25V f = 1.0MHz	-	3940	-	pF
Output Capacitance	C _{oss}		-	262	-	
Reverse Transfer Capacitance	C _{rss}		-	237	-	
Switching Characteristics						
Turn-on Delay Time	T _{d(on)}	VDD =-15V VGS = -10V RG = 3.3Ω, RL = 15Ω ID = -1A	-	40		ns
Turn-on Rise Time	T _r		-	35		
Turn-Off Delay Time	T _{d(OFF)}		-	100		
Turn-Off Fall Time	T _f		-	9.6		
Total Gate Charge	Q _g	VDD = -32V VGS = -10V ID = -50A	-	67.5	-	nC
Gate-Source Charge	Q _{gs}		-	16	-	
Gate-Drain Charge	Q _{gd}		-	9	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _S =-1.7A, V _{GS} =0V T _j = 25°C	-	-	-1.2	V

Notes:

1. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
2. The data tested by pulsed, pulse width $\leq 10\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=-25V, V_{GS}=-10V, L=0.5mH$
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation

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Typical Electrical and Thermal Characteristics

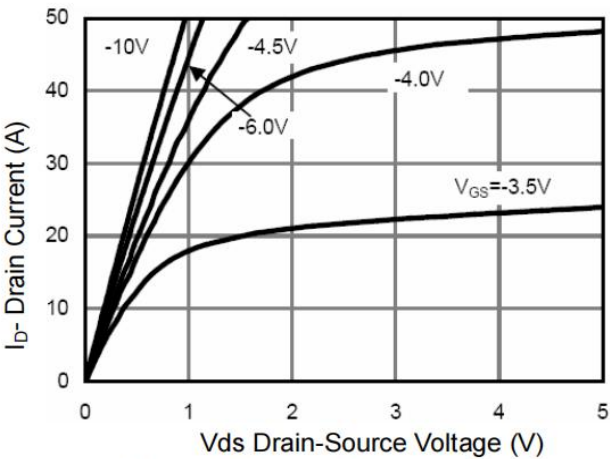


Figure 1 Output Characteristics

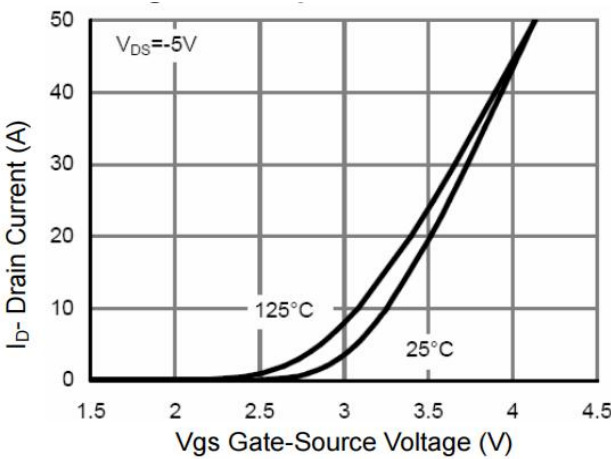


Figure 2 Transfer Characteristics

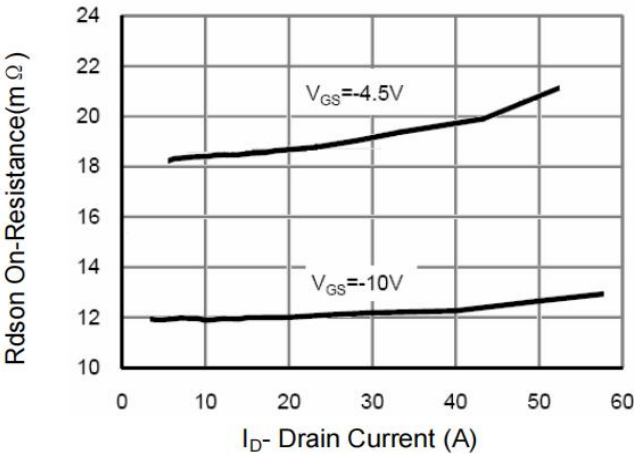


Figure 3 Rdson- Drain Current

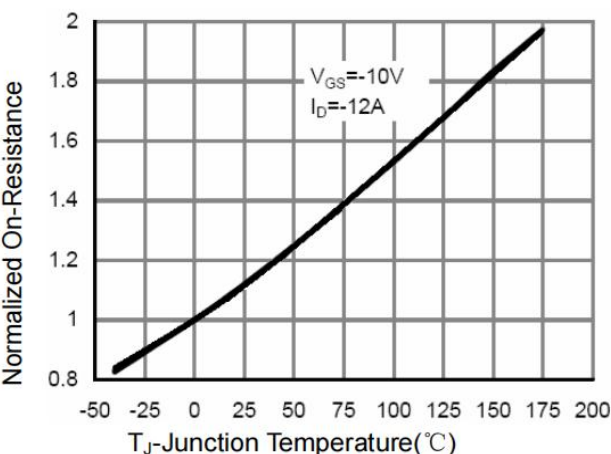


Figure 4 Rdson-Junction Temperature

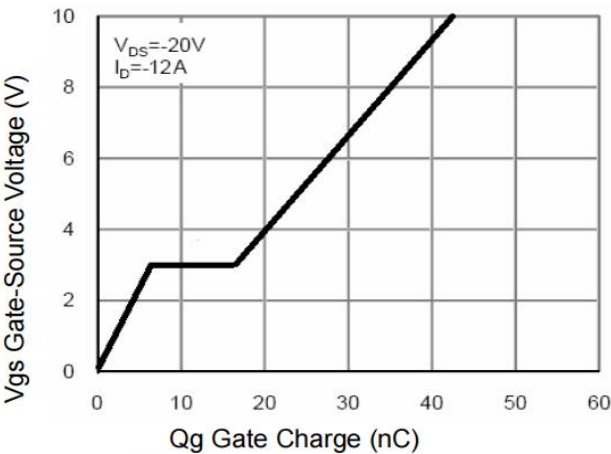


Figure 5 Gate Charge

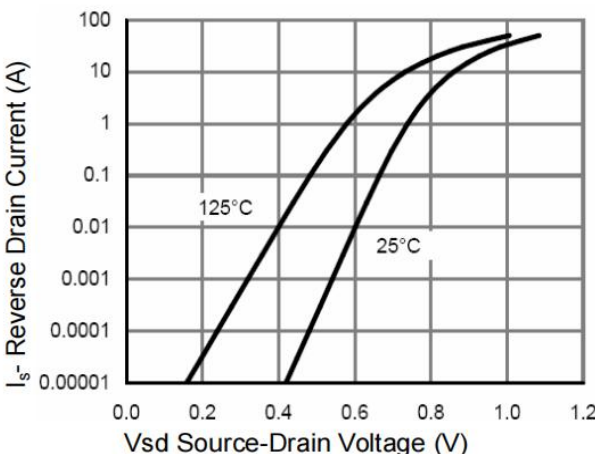


Figure 6 Source- Drain Diode Forward

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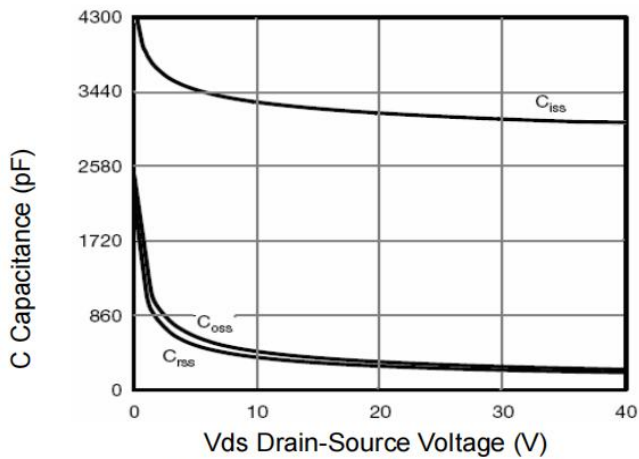


Figure 7 Capacitance vs Vds

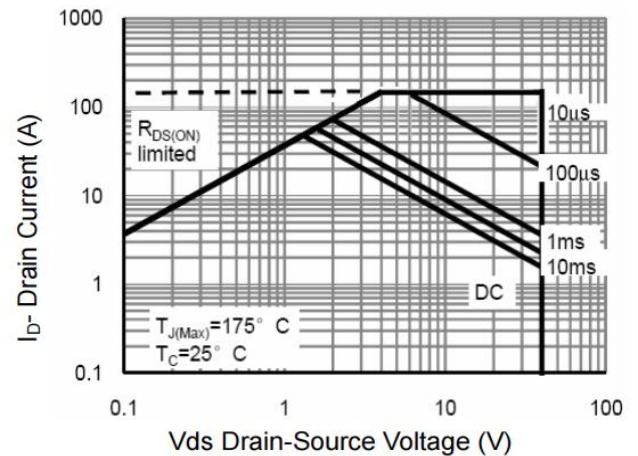


Figure 8 Safe Operation Area

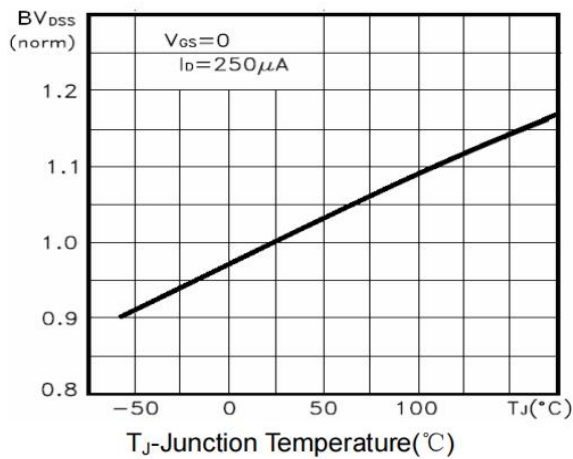


Figure 9 BV_{DSS} vs Junction Temperature

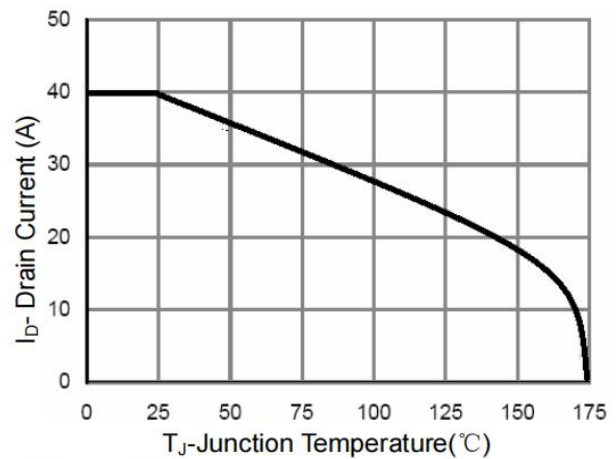


Figure 10 I_D Current Derating vs Junction Temperature

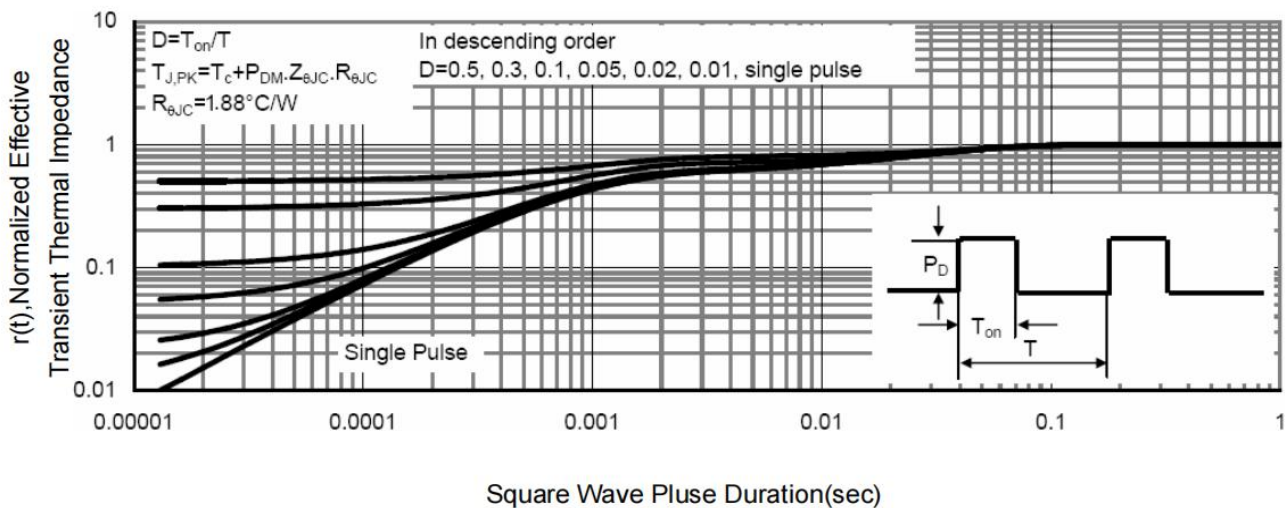


Figure 11 Normalized Maximum Transient Thermal Impedance

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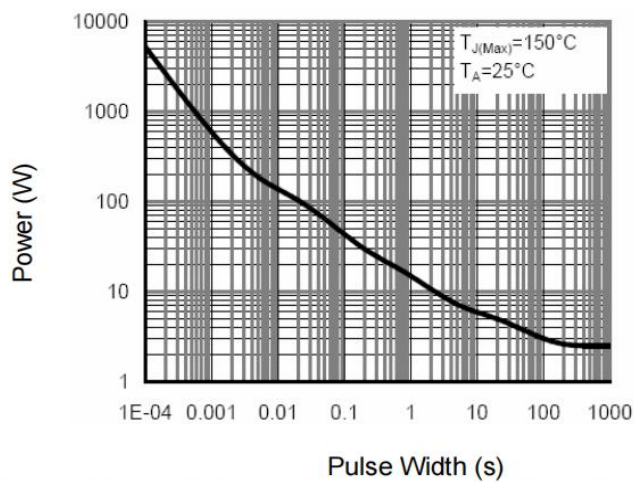
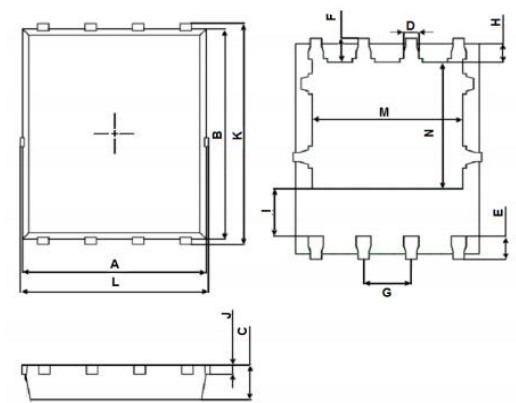


Figure 12 Single Pulse Power Rating Junction-to-Ambient

PDFN5*6-8L Package Information



PDFN5×6-8L		
Dimension	Min.	Max.
A	4.824	4.976
B	5.674	5.826
C	0.900	1.000
D	0.350	0.450
E	0.559	0.711
F	0.574	0.726
G	1.250	1.290
H	0.424	0.576
I	1.190	1.390
J	0.154	0.354
K	5.974	6.126
L	4.944	5.096
M	3.910	4.110
N	3.375	3.575

