

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Lead free product is acquired
- ☒ Split Gate Trench technology
- ☒ Excellent $R_{DS(ON)}$ and low gate charge

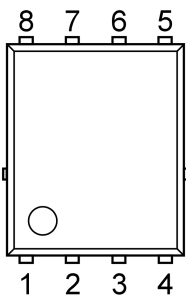
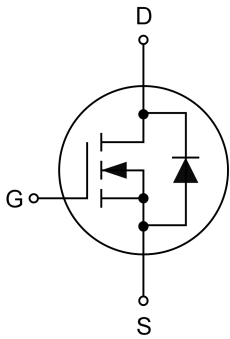
1.2 Applications

- ☒ PWM applications
- ☒ Power management
- ☒ Load Switch

1.3 Quick reference

- ☒ $BV \geq 40\text{ V}$
- ☒ $P_{tot} \leq 89\text{ W}$
- ☒ $I_D \leq 150\text{ A}$
- ☒ $R_{DS(ON)} \leq 1.8\text{ m}\Omega @V_{GS} = 10\text{ V}$
- ☒ $R_{DS(ON)} \leq 3.3\text{ m}\Omega @V_{GS} = 4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN5x6-8L	
4	Gate		
5,6,7,8	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	40	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	150	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	100	A
I_{DM}^*	Pulsed Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	400	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	-	89	W
T_{stg}	Storage Temperature		-55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S^{**}	Diode Forward Current	$T_C=25^{\circ}\text{C}$	-	150	A
E_{AS}	Single Pulsed Avalanche Energy	$T_J=25^{\circ}\text{C}, V_{DD}=15\text{ V},$ $R_G=25\ \Omega, L=0.5\text{ mH}$	-	320	mJ
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	1.4	$^{\circ}\text{C/W}$

Notes:

- * Repetitive Rating: pulse width limited by maximum junction temperature.
- ** Surface Mounted on FR4 Board, $t \leq 10\text{ sec.}$

4. Marking Information

Product Name	Marking
KJ1R7N04G	KJ1R7N04G XXXXXX

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity (pcs)
KJ1R7N04G	PDFN 5x6-8L	13"	16 mm	5000

Note: KUIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

6. Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

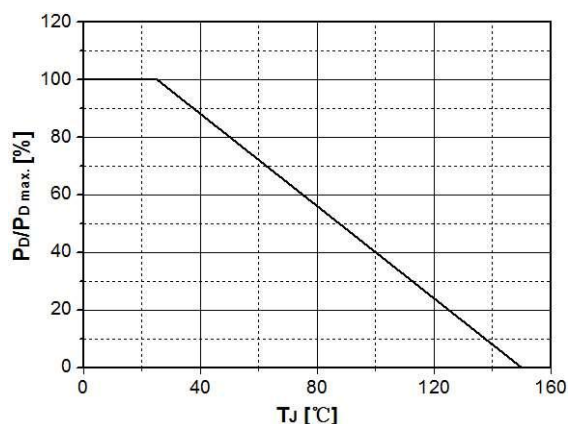
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	40	-	-	V
V _{GS(th)} ^a	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	1.0	1.7	2.5	V
I _{DSS}	Zero Gate Voltage drain Current	V _{DS} =40 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate-body Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	± 100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =10 V, I _D =75 A	-	1.6	1.8	mΩ
		V _{GS} =4.5 V, I _D =30 A	-	2.0	3.3	
g _{fs}	Forward Threshold Voltage	V _{DS} =5 V, I _D =75 A	60	-	-	S
R _g	Gate Resistance	V _{DS} =V _{GS} =0 V, f=1 MHz	-	1.94	-	Ω
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =75 A, V _{GS} =0 V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =50 A, dI _{SD} /dt=100 A/μs	-	35	-	ns
Q _{rr}	Reverse Recovery Charge		-	31	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =25 V Frequency=1 MHz	-	3000	-	pF
C _{oss}	Output Capacitance		-	895	-	
C _{rss}	Reverse Transfer Capacitance		-	37	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =20 V, V _{GEN} =10 V, R _G =3 Ω, I _{DS} =75 A	-	13	-	ns
t _r	Turn-on Rise Time		-	3	-	
t _{d(off)}	Turn-off Delay Time		-	52	-	
t _f	Turn-off Fall Time		-	24	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =20 V, V _{GS} =10 V, I _{DS} =75 A	-	40	-	nC
Q _{gs}	Gate-Source Charge		-	8	-	
Q _{gd}	Gate-Drain Charge		-	7	-	

Notes:

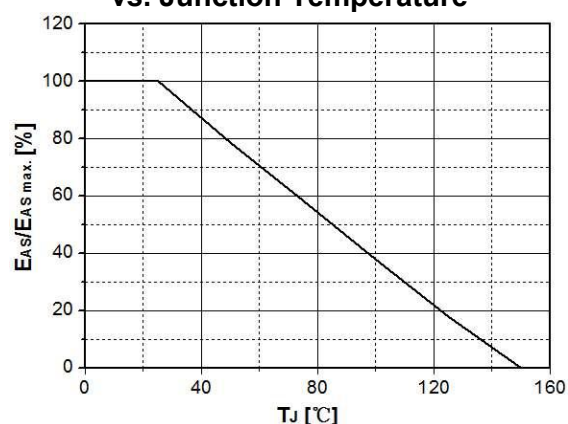
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

7. Typical Characteristics (cont.)

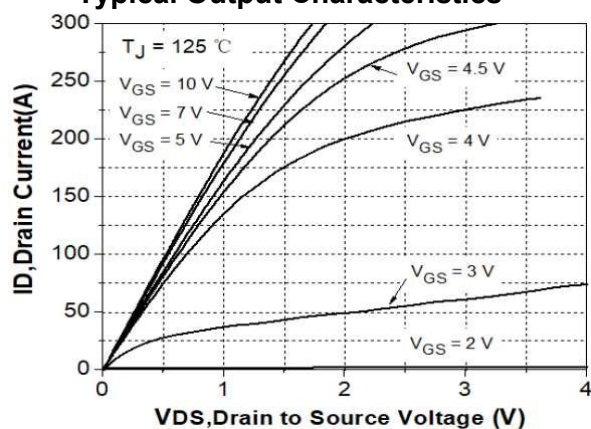
Power Dissipation Derating Curve



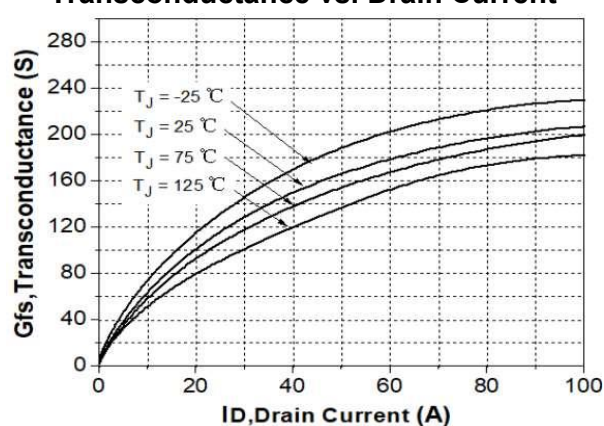
Avalanche Energy Derating Curve vs. Junction Temperature



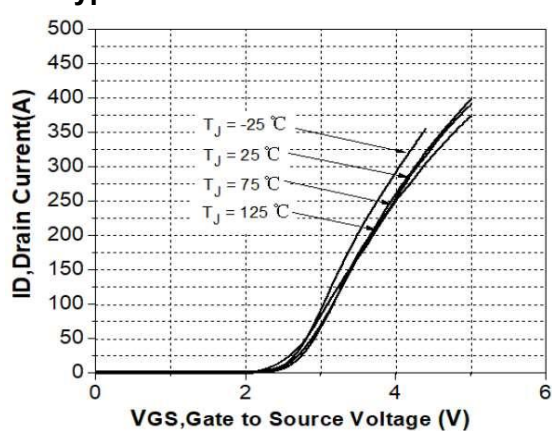
Typical Output Characteristics



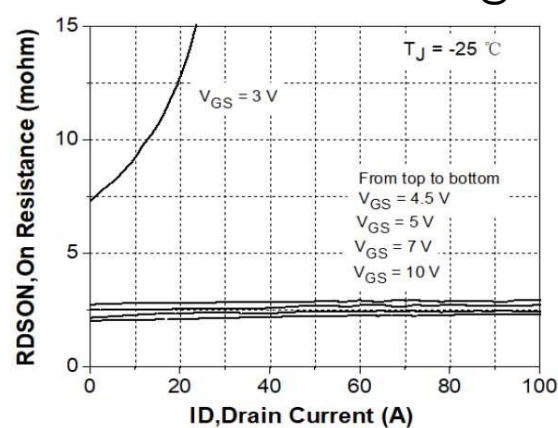
Transconductance vs. Drain Current



Typical Transfer Characteristics

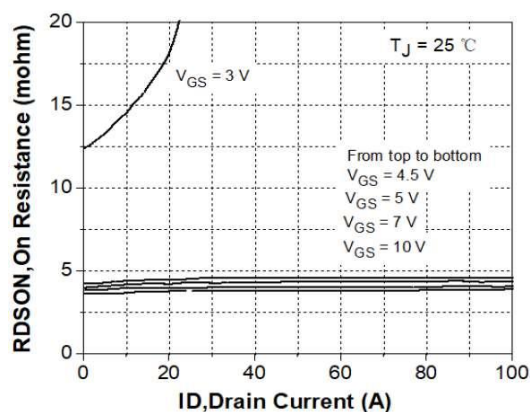


State Resistance vs. Drain Current @-25°C

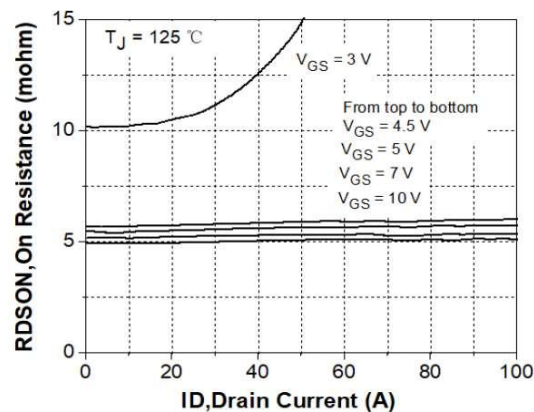


7. Typical Characteristics (cont.)

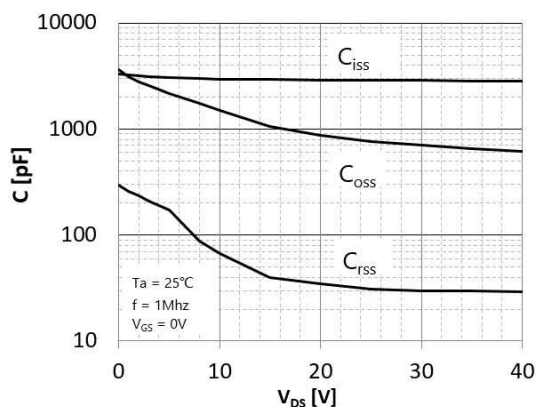
State Resistance vs. Drain Current @25°C



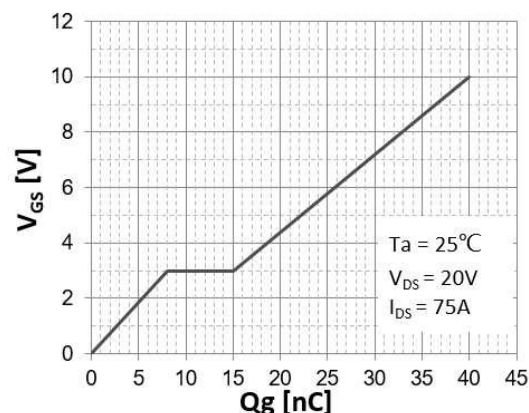
State Resistance vs. Drain Current @125°C



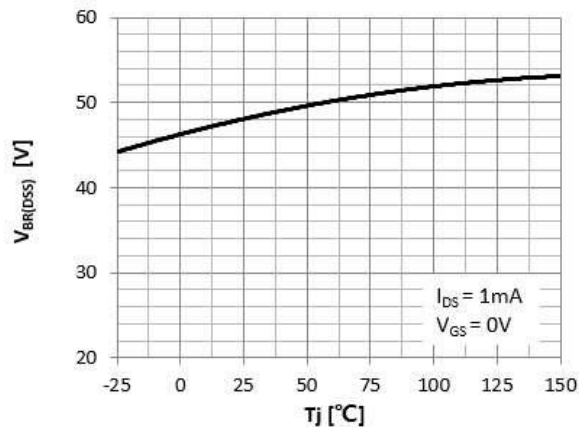
Typical Capacitance vs. Drain Source Voltage



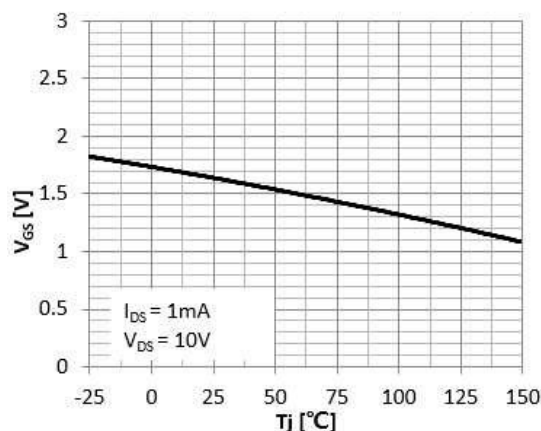
Dynamic Input Characteristics



Breakdown Voltage vs. Junction Temperature

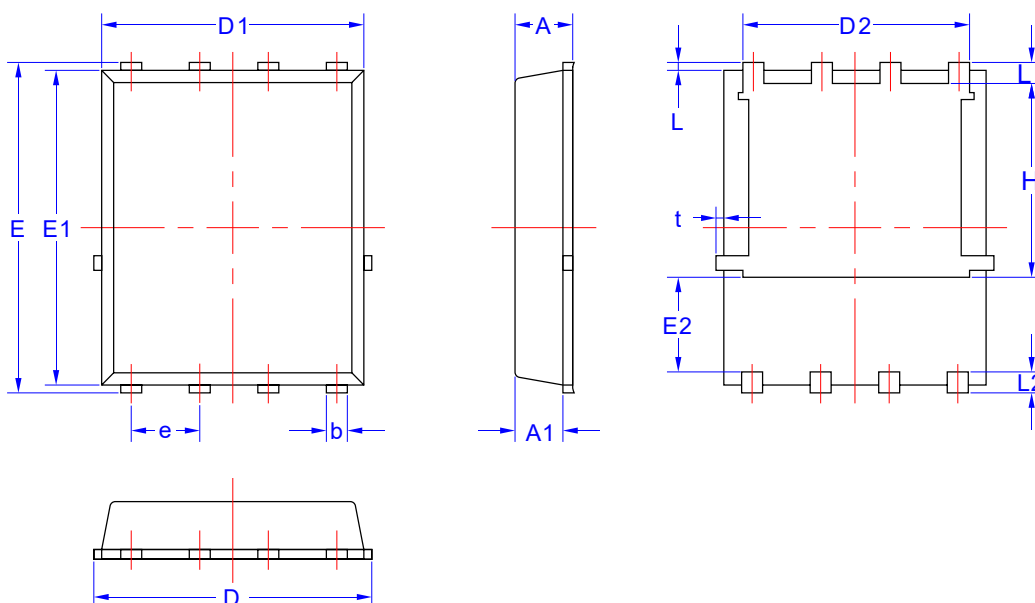


Gate Threshold Voltage vs. Junction Temperature



8. Package Dimensions

PDFN 5x6-8L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX
A	1.03	1.17
A1	0.824	0.97
b	0.34	0.48
D	4.80	5.40
D1	4.80	5.00
D2	4.11	4.31
E	5.95	6.15
E1	5.65	5.85
E2	1.40	-
e	1.27 BSC	
L	0.05	0.25
L1	0.38	0.50
L2	0.38	0.71
H	3.30	3.50
t	-	0.18