

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Split Gate Trench
- ☑ Lead free product is acquired
- ☑ Excellent $R_{DS(ON)}$ and Low Gate Charge

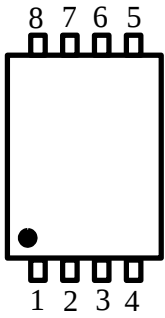
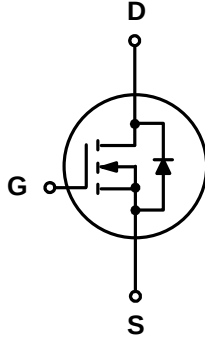
1.2 Applications

- ☑ PWM applications
- ☑ Power management
- ☑ Load Switch

1.3 Quick reference

- ☑ $BV \geq 30\text{ V}$
- ☑ $P_{tot} \leq 59\text{ W}$
- ☑ $I_D \leq 180\text{ A}$
- ☑ $R_{DS(ON)} \leq 1.1\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☑ $R_{DS(ON)} \leq 1.7\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

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 °C	30	-	V
V _{GS}	Gate-Source Voltage	T _C = 25 °C	-	± 20	V
I _D	Drain Current	T _C = 25 °C, V _{GS} = 10 V	-	180	A
		T _C = 100 °C, V _{GS} = 10 V	-	120	A
I _{DM} *	Pulsed Drain Current	T _C = 25 °C, V _{GS} = 10 V	-	378	A
P _{tot}	Total Power Dissipation	T _C = 25 °C	-	59	W
T _{stg}	Storage Temperature		- 55	150	°C
T _J	Junction Temperature		-	150	°C
I _S **	Diode Forward Current	T _C = 25 °C	-	180	A
E _{AS}	Single Pulsed Avalanche Energy	T _J = 25 °C, V _{DD} = 27 V, R _G = 25 Ω, L = 0.3 Mh I _{AS} = 32 V	-	160	mJ
R _{θJC}	Thermal Resistance- Junction to Case		-	1.5	°C / W

Notes :

* Repetitive Rating: pulse width limited by maximum junction temperature

** Surface Mounted on FR4 Board, t ≤ 10 sec

4. Marking Information

Product Name	Marking
KJ1R5N03G	1R5N03 YWWXXX YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ1R5N03G	PDFN5*6	13 inch		5000	

Note: KUAJIEXIN 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)

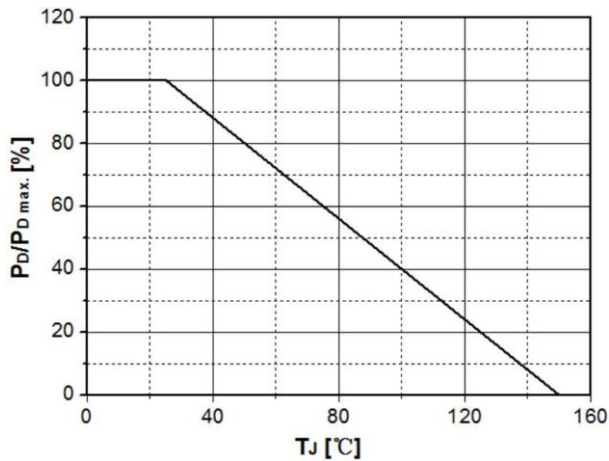
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	30	-	-	V
V _{GS(th)} ^a	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1.2	1.7	2.2	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} = 40 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate 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 = 25 A	-	0.9	1.1	m Ω
		V _{GS} = 4.5 V, I _D = 25 A	-	1.5	1.7	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =10 A, V _{GS} = 0 V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} = 15A, dI _{SD} /dt = 100 A/μs	-	84	-	nS
Q _{rr}	Reverse Recovery Charge		-	124	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 15 V Frequency = 1 MHz	-	3800	-	pF
C _{oss}	Output Capacitance		-	2400	-	
C _{rss}	Reverse Transfer Capacitance		-	35	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 15 V, V _{GEN} = 10 V, R _G = 3 Ω, I _{DS} = 15 A	-	16.6	-	nS
t _r	Turn-on Rise Time		-	48.2	-	
t _{d(off)}	Turn-off Delay Time		-	66	-	
t _f	Turn-off Fall Time		-	20.4	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 15 V, V _{GS} = 4.5 V, I _{DS} = 15 A	-	31	-	nC
Q _{gs}	Gate-Source Charge		-	8.6	-	
Q _{gd}	Gate-Drain Charge		-	15	-	

Notes :

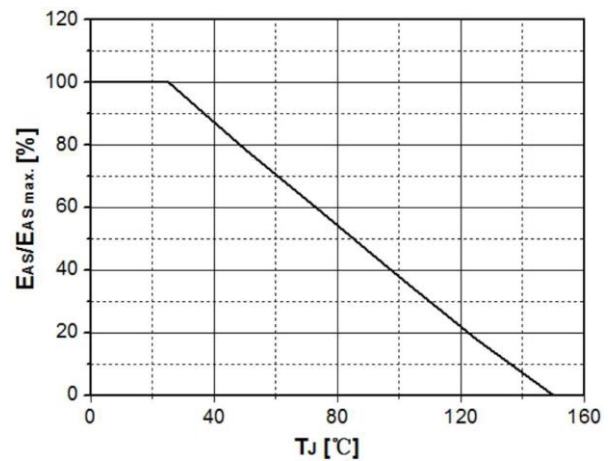
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

7. Typical Characteristics

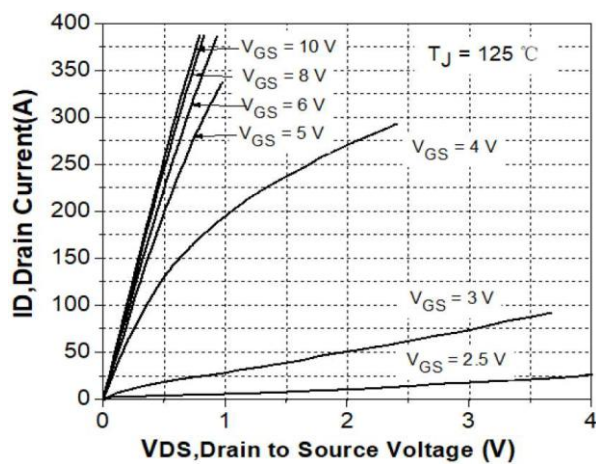
Power Dissipation Derating Curve



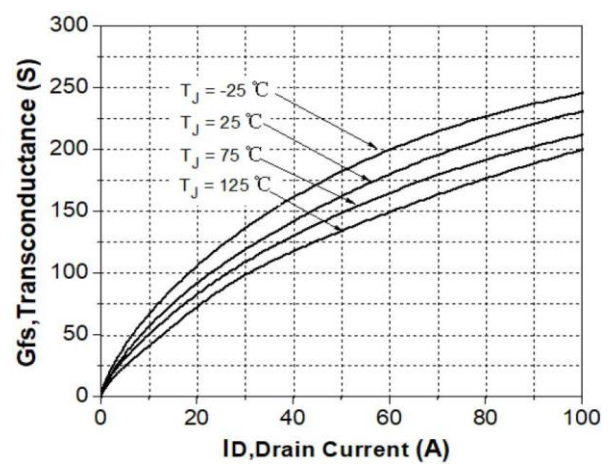
Avalanche Energy Derating Curve vs. Junction Temperature



Typical Output Characteristics

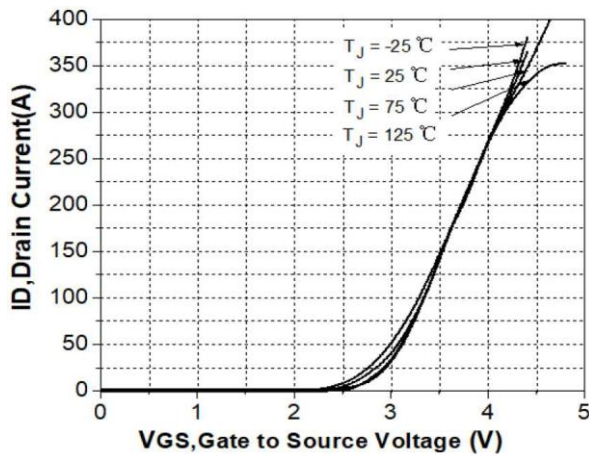


Transconductance vs. Drain Current

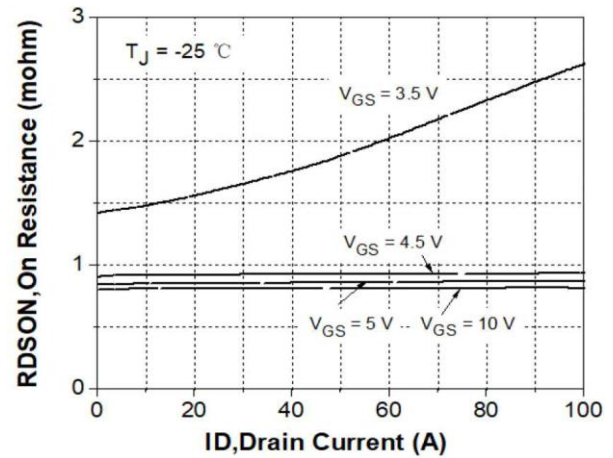


7. Typical Characteristics (Cont.)

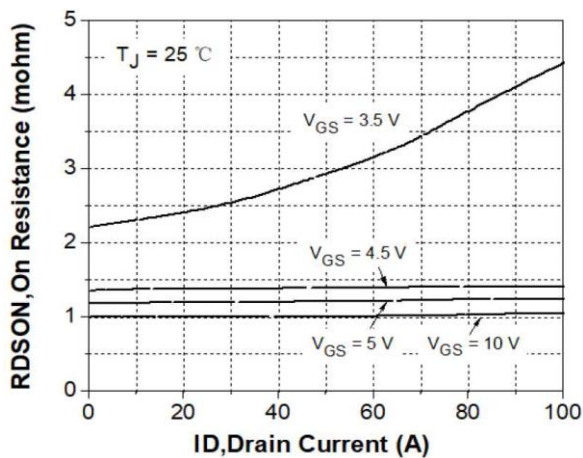
Typical Transfer Characteristics



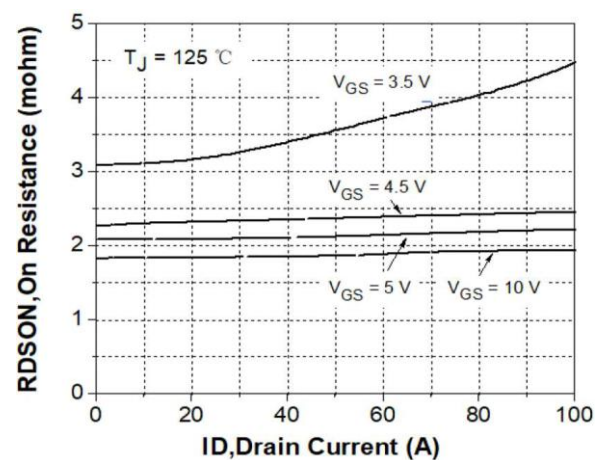
State Resistance vs. Drain Current @-25°C



State Resistance vs. Drain Current @25°C

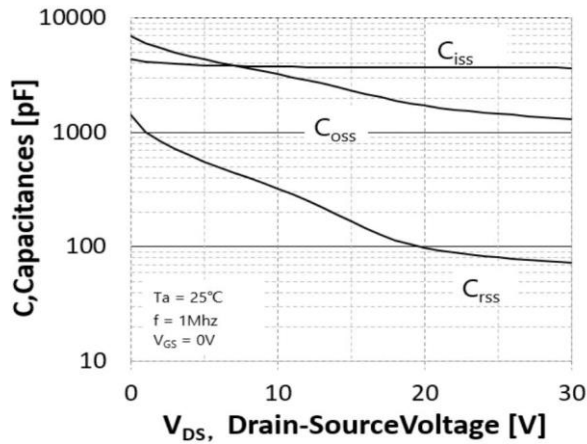


State Resistance vs. Drain Current @125°C

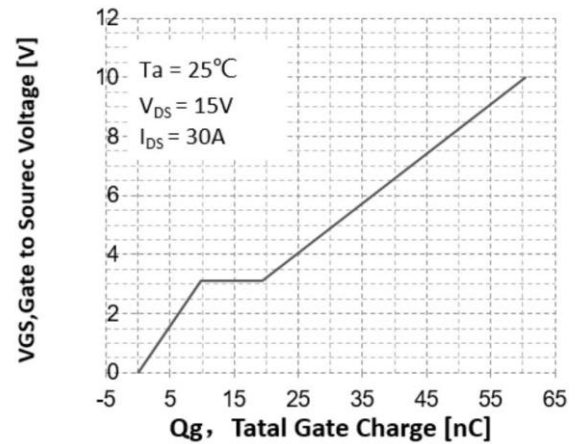


7. Typical Characteristics (Cont.)

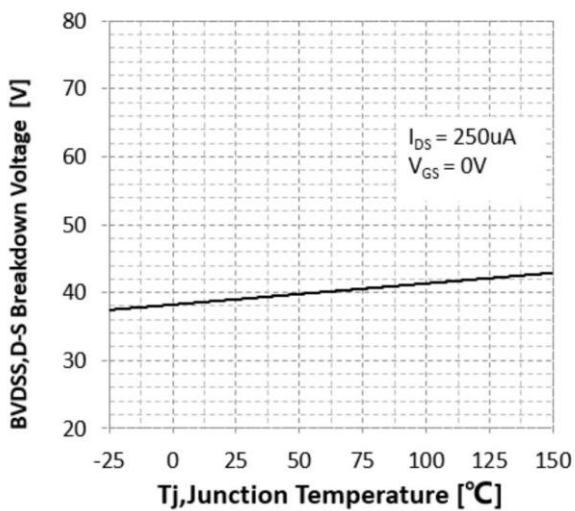
Typical Capacitance vs. Drain Source Voltage



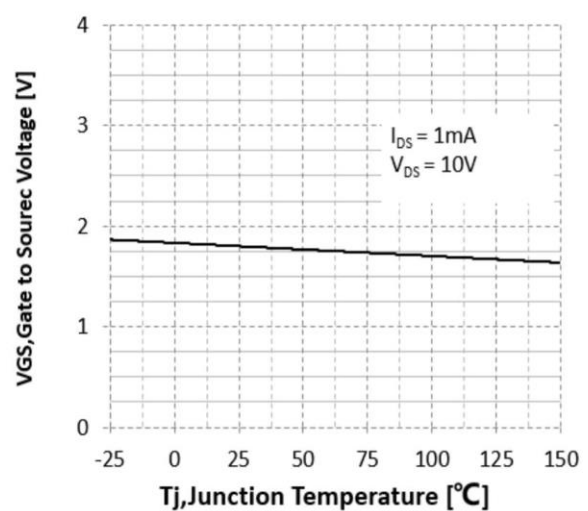
Dynamic Input Characteristics



Breakdown Voltage vs. Junction Temperature

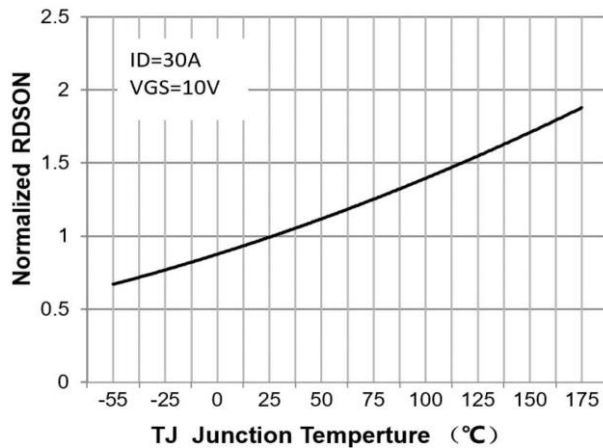


Gate Threshold Voltage vs. Junction Temperature

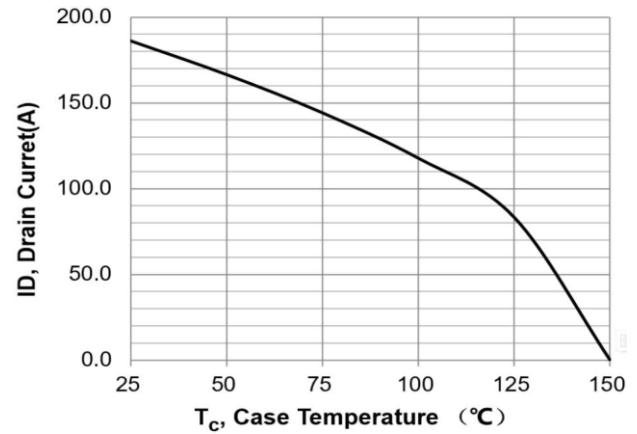


7. Typical Characteristics (Cont.)

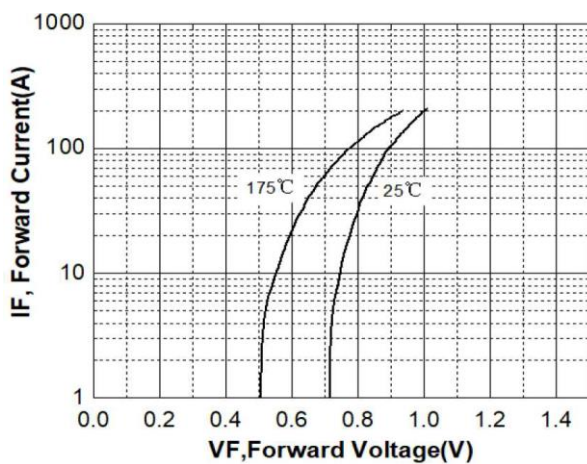
On-Resistance Variation vs. Junction



Maximum Drain Current vs. Case Temperature

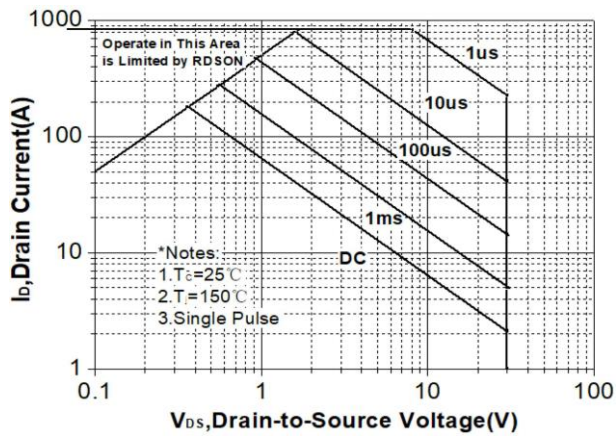


Body Diode Forward Voltage vs. Reverse Drain Current

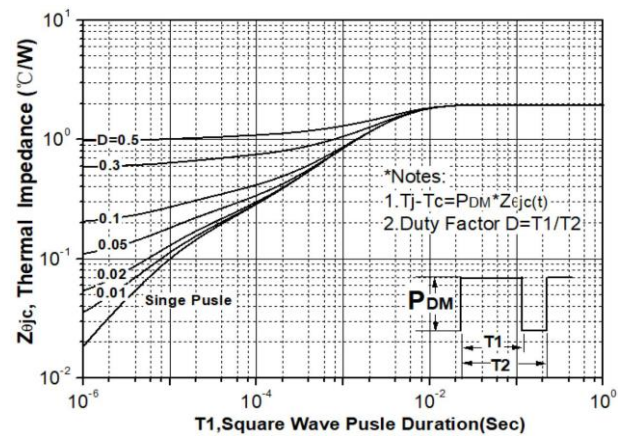


7. Typical Characteristics (Cont.)

Safe Operating Area

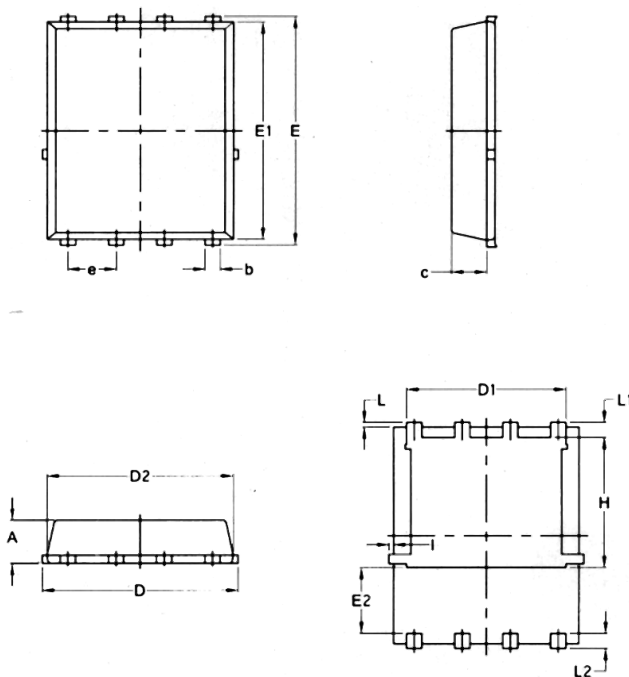


Transient Thermal Response Curve



8. Package Dimensions

PDFN5x6 - 8L Package



SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070