

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

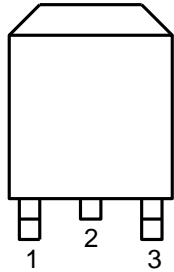
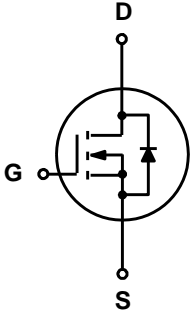
#### 1.2 Applications

- Motor drivers
- DC - DC Converter
- BMS
- Power Tool

#### 1.3 Quick reference

- $BV \geq 150\text{ V}$
- $R_{DS(ON)} \leq 15\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \leq 147\text{ W}$
- $R_{DS(ON)} \leq 18\text{ m}\Omega @ V_{GS} = 6\text{ V}$
- $I_D \leq 70\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate (G)		
2	Drain (D)		
3	Source (S)		
		<p>Top View</p> <p>TO-263-2L</p>	



### 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> = 25 °C	150	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> = 25 °C	-	± 20	V
I <sub>D</sub> *	Drain Current	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	70	A
I <sub>DM</sub> **,**	Pulsed Source Current	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	180	A
P <sub>tot</sub> *	Total Power Dissipation	T <sub>C</sub> = 25 °C	-	147	W
T <sub>stg</sub>	Storage Temperature		- 55	150	°C
T <sub>J</sub>	Junction Temperature		-	150	°C
I <sub>S</sub> *	Diode Forward Current	T <sub>C</sub> = 25 °C	-	66	A
R <sub>θJA</sub> *	Thermal Resistance- Junction to Ambient		-	62.5	°C / W
R <sub>θJC</sub> *	Thermal Resistance- Junction to Case		-	0.85	

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 10 μs, duty cycle ≤ 1 %
- \*\*\* Limited by bonding wire
- \*\*\*\* Surface Mounted on minimum footprint pad area.

### 4. Marking Information

Product Name	Marking
KJ1515D	<div style="display: inline-block; border: 1px solid black; padding: 2px;">1515 YWWXXX</div> <span style="margin-left: 10px;">YWWXXX: Date Code</span>

### 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ1515D	TO263			800	

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 )



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## 6. Electrical Characteristics (T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	150	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	2	-	4	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = 120 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		T <sub>J</sub> = 85 °C	-	-	30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 20 V, V <sub>DS</sub> = 0 V	-	-	± 100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A	-	13	15	mΩ
	Drain-Source On-State Resistance	V <sub>GS</sub> = 6 V, I <sub>D</sub> = 10 A	-	16	18	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = 20 A, V <sub>GS</sub> = 0 V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = 20 A, dI <sub>SD</sub> /dt = 100 A/μs	-	89	-	nS
Q <sub>rr</sub>	Reverse Recovery Charge		-	315	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 75 V Frequency = 1 MHz	-	2820	-	pF
C <sub>oss</sub>	Output Capacitance		-	209	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	28	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 75 V, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 3.75 Ω, I <sub>D</sub> = 20 A	-	15	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	55	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	28	-	
t <sub>f</sub>	Turn-off Fall Time		-	57	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 75 V, I <sub>DS</sub> = 20 A	-	43	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	16	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	8.7	-	

Notes :

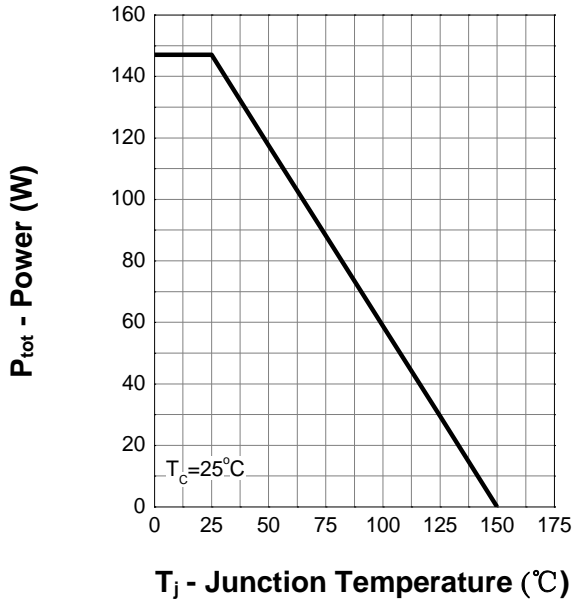
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

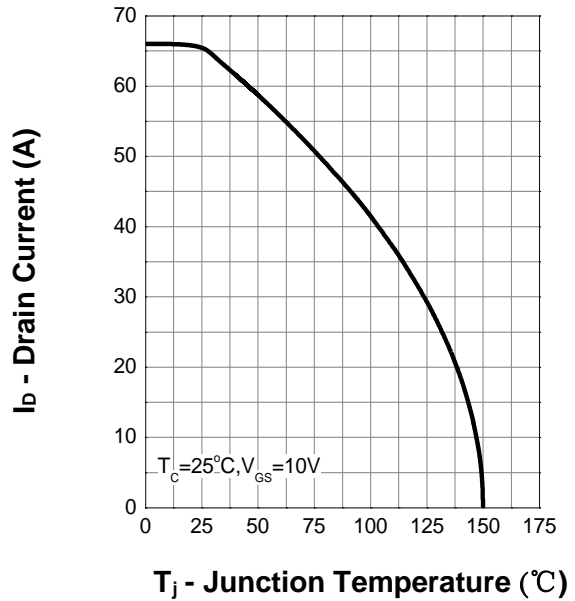


### 7. Typical Characteristics

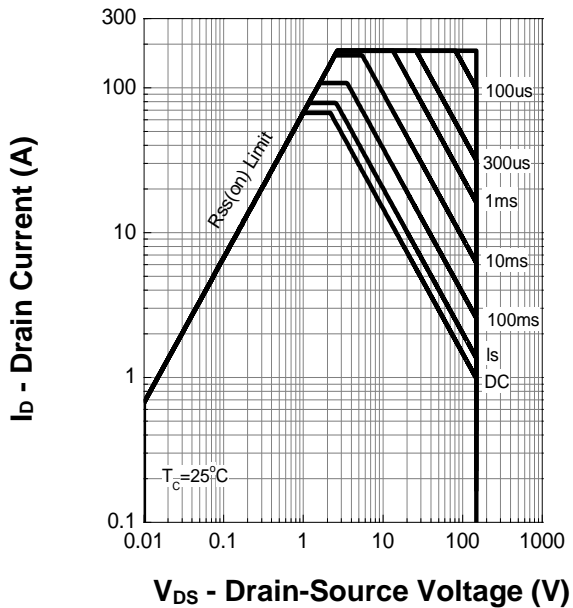
Power Capability



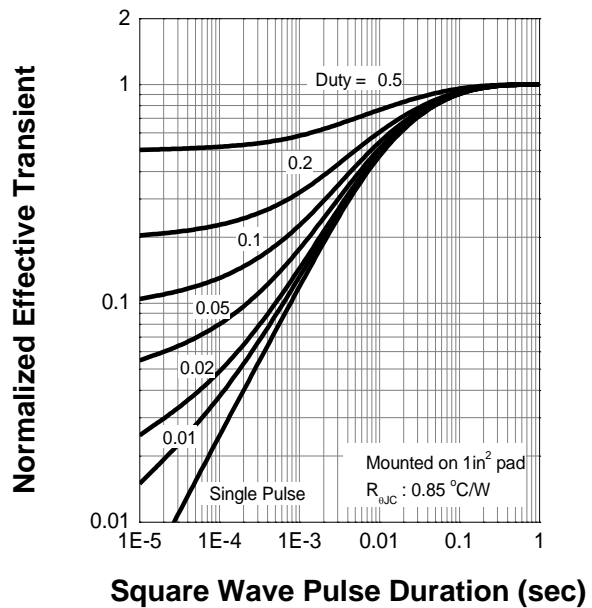
Current Capability



Safe Operation Area



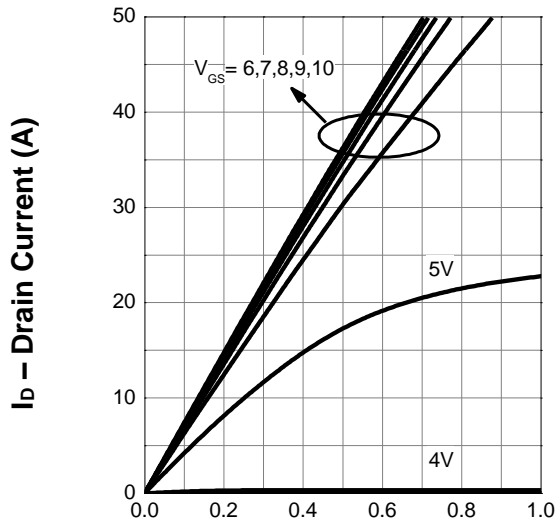
Thermal Transient Impedance





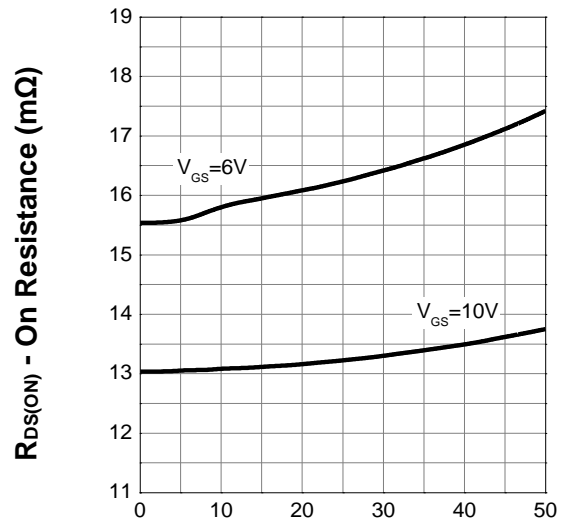
### 7. Typical Characteristics (cont.)

Output Characteristics



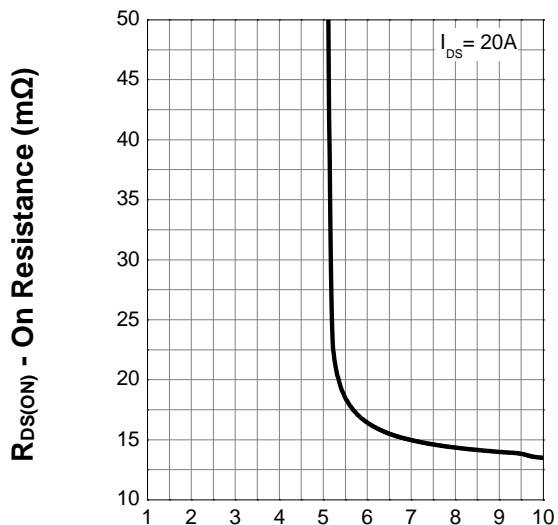
$V_{DS}$  - Drain-Source Voltage (V)

Drain-Source On Resistance



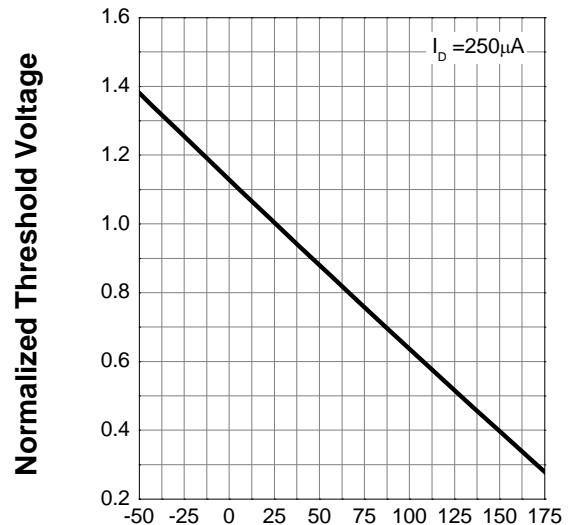
$I_D$  - Drain Current (A)

Transfer Characteristics



$V_{GS}$  - Gate-Source Voltage (V)

Gate Threshold Voltage

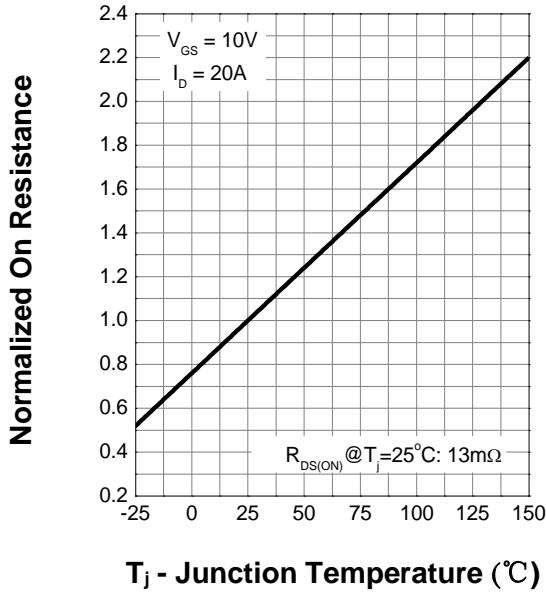


$T_j$  - Junction Temperature ( $^{\circ}C$ )

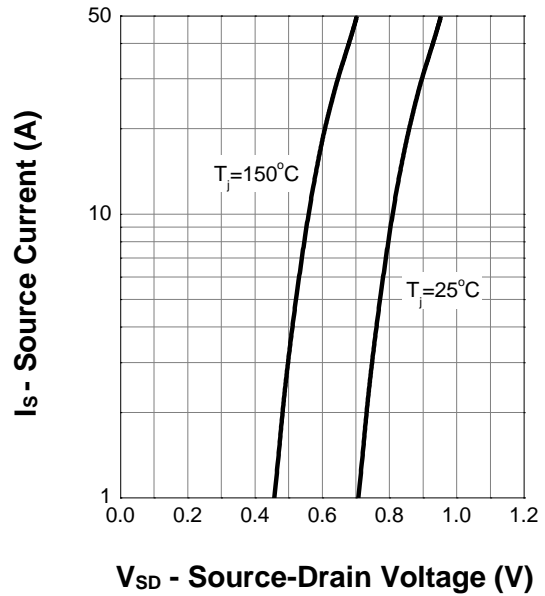


### 7. Typical Characteristics (cont.)

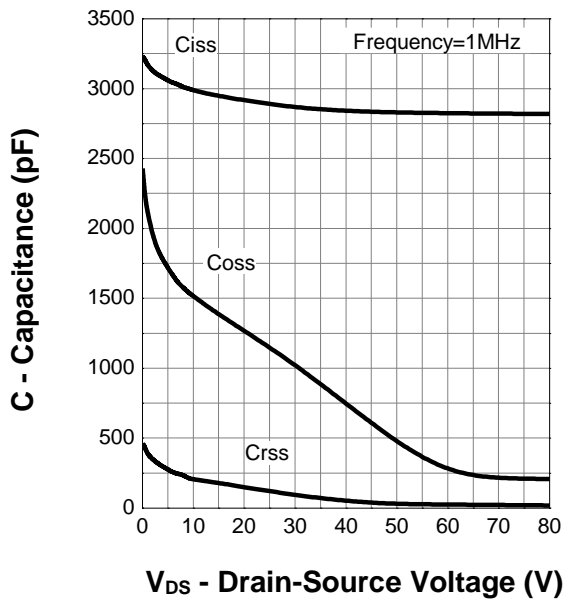
Drain-Source On Resistance



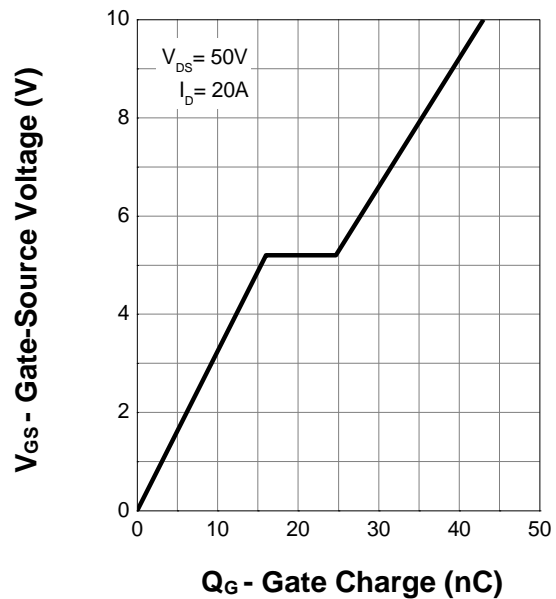
Body Diode Characteristics



Capacitance



Gate Charge



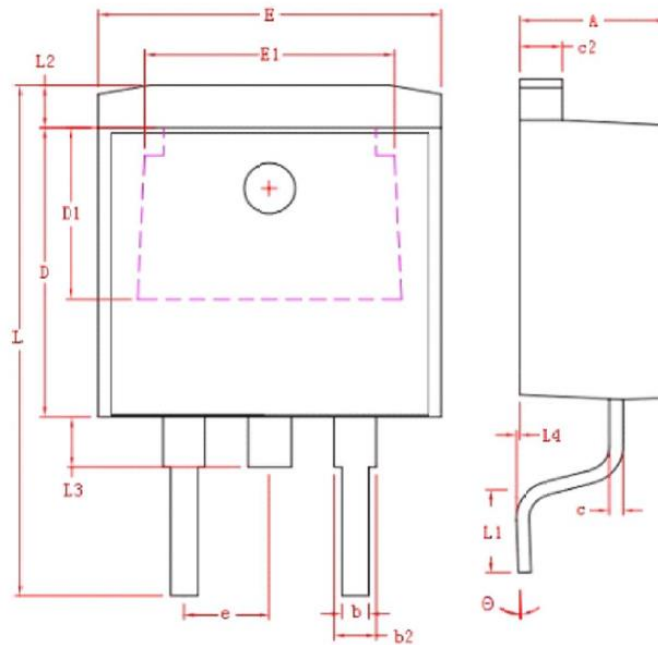


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## 8.Package Dimensions

TO263-2L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	4.40	4.80
b	0.76	1.00
L4	0.00	0.25
C	0.36	0.50
L3	1.50 REF	
L1	2.29	2.79
E	9.80	10.40
E1	7.40 REF	
c2	1.25	1.45
b2	1.17	1.47
D	8.60	9.00
D1	5.10 REF	
e	2.54 REF	
L	14.6	15.8
$\theta$	$0^\circ \pm 3^\circ$	
L2	1.27 REF	