

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package  
 Advanced trench cell design
- Extremely low threshold voltage  
 ESD protected

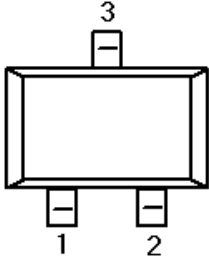
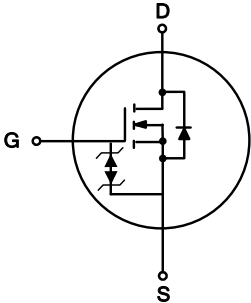
#### 1.2 Applications

- Portable appliances  
 High speed switch
- Battery management  
 Low power DC to DC Converter

#### 1.3 Quick reference

- $BV \leq 20\text{ V}$   
  $P_{tot} \leq 0.27\text{ W}$   
  $I_D \leq 0.57\text{ A}$
- $R_{DS(ON)} \leq 0.55\ \Omega @ V_{GS} = 4.5\text{ V}$   
 $R_{DS(ON)} \leq 0.7\ \Omega @ V_{GS} = 2.5\text{ V}$   
 $R_{DS(ON)} \leq 0.9\ \Omega @ V_{GS} = 1.8\text{ V}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 <p>Top View SOT-723</p>	
2	Source(S)		
3	Drain(D)		



## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>A</sub> = 25 °C	20	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>A</sub> = 25 °C	-	± 10	V
I <sub>D</sub> *	Drain Current	T <sub>A</sub> = 25 °C, V <sub>GS</sub> = 4.5 V	-	0.57	A
I <sub>DM</sub> **	Pulsed Drain Current	T <sub>A</sub> = 25 °C, V <sub>GS</sub> = 4.5 V	-	2.2	A
P <sub>tot</sub>	Total Power Dissipation	T <sub>A</sub> = 25 °C	-	0.27	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>A</sub> = 25 °C	-	0.57	A
R <sub>θJA</sub>	Thermal Resistance- Junction to Ambient		-	461	°C / W

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %

## 4. Marking Information

Product Name	Marking
KJ500RN02S7	52

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ500RN02S7	SOT723			8000	

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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KJ500RN02S7

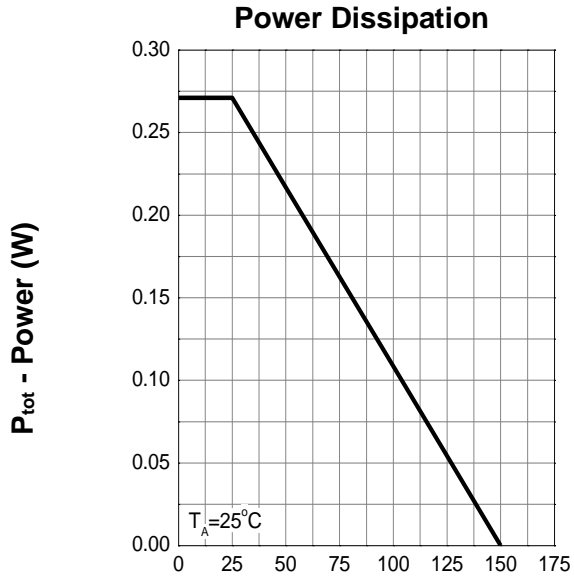
## 6. Electrical Characteristics (T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>DS</sub> = 250 μA	20	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	0.5	-	1	V
I <sub>DSS</sub>	Drain Leakage Current	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0V	-	-	1	μA
		T <sub>J</sub> = 85 °C	-	-	30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 10 V, V <sub>DS</sub> = 0 V	-	-	± 10	uA
R <sub>DS(ON)</sub> <sup>a</sup>	On-State Resistance	V <sub>GS</sub> = 4.5 V, I <sub>DS</sub> = 0.5 A	-	0.43	0.55	Ω
		V <sub>GS</sub> = 2.5 V, I <sub>DS</sub> = 0.2 A	-	0.55	0.7	
		V <sub>GS</sub> = 1.8 V, I <sub>DS</sub> = 0.1 A	-	0.7	0.9	
Diode Characteristics						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = 0.5 A, V <sub>GS</sub> = 0V	-	-	1.2	V
Dynamic Characteristics <sup>b</sup>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 10 V Frequency = 1 MHz	-	34	-	pF
C <sub>oss</sub>	Output Capacitance		-	2.8	-	
C <sub>riss</sub>	Reverse Transfer Capacitance		-	0.9	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 10 V, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 20 Ω, I <sub>DS</sub> = 0.5 A	-	1.4	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	18	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	30	-	
t <sub>f</sub>	Turn-off Fall Time		-	20	-	
Gate Charge Characteristics <sup>b</sup>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V, I <sub>DS</sub> = 0.5 A	-	0.82	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	0.18	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	0.11	-	

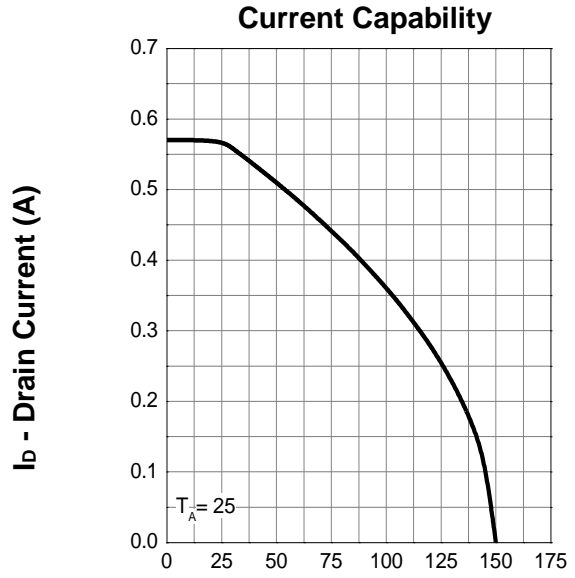
Notes :

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

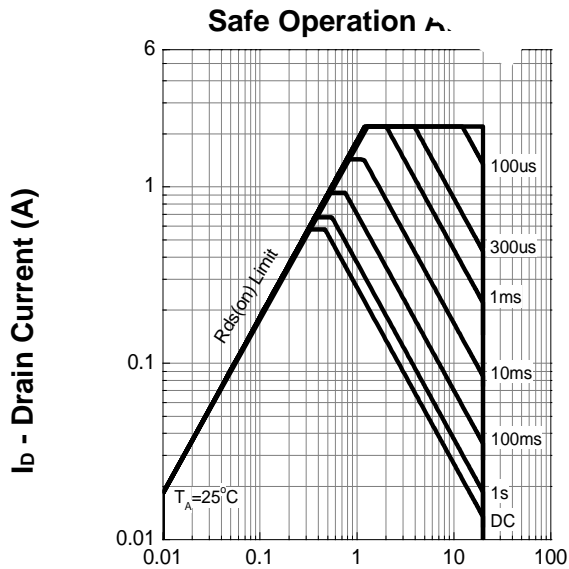
## 7. Typical Characteristics



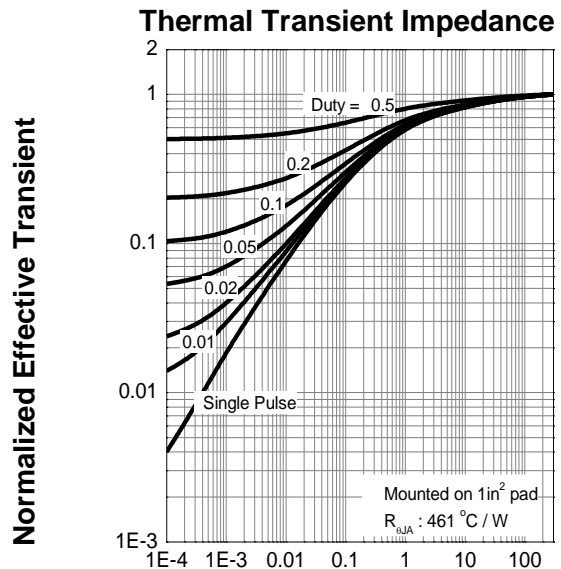
$T_j$  - Junction Temperature (°C)



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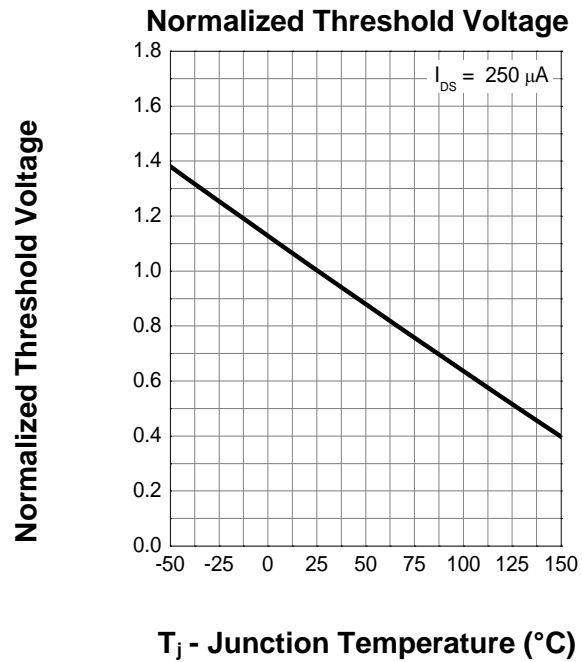
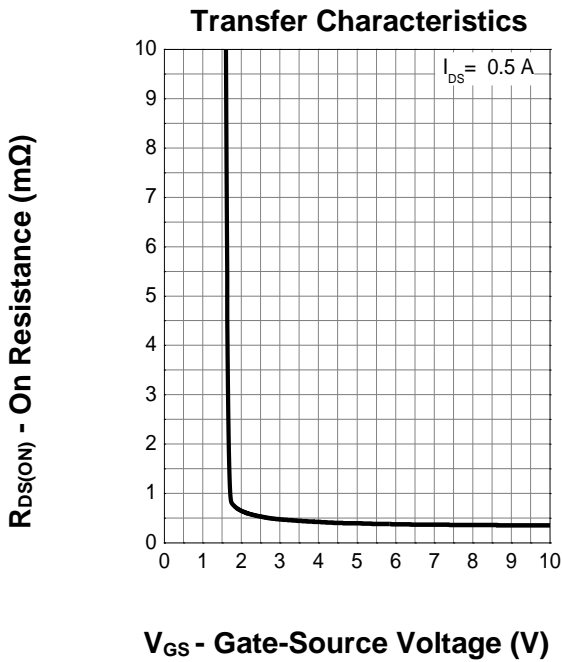
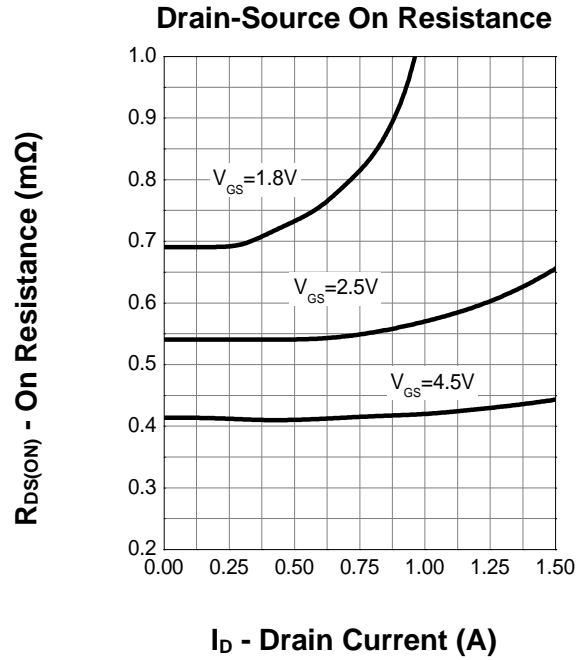
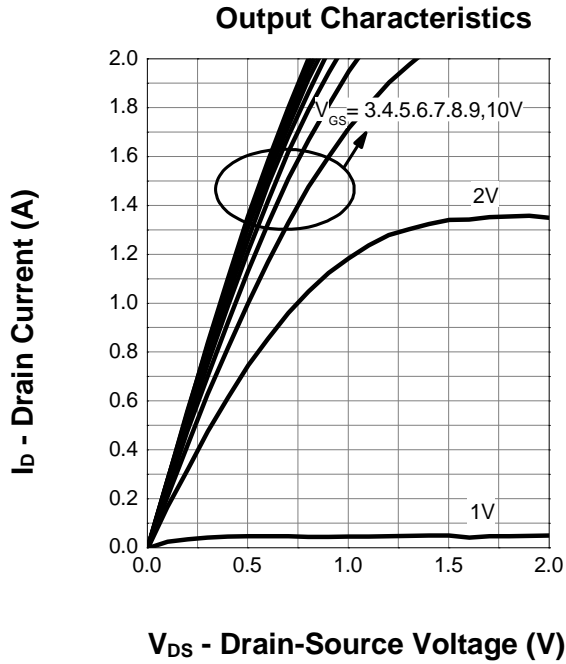


$-V_{DS}$  - Drain-Source Voltage (V)

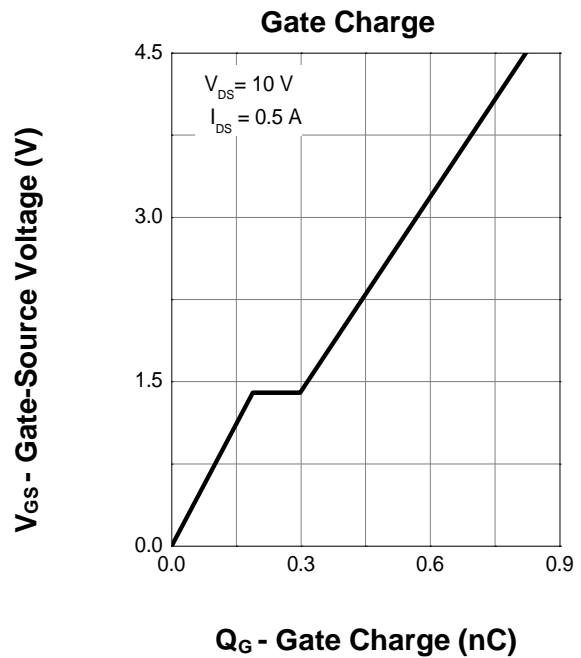
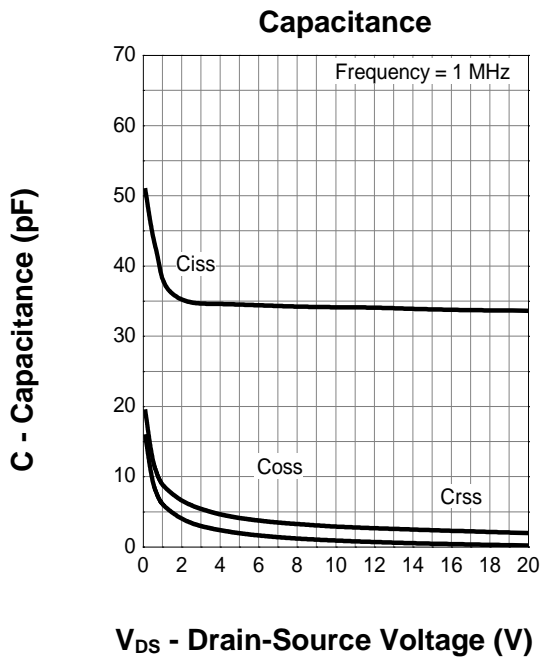
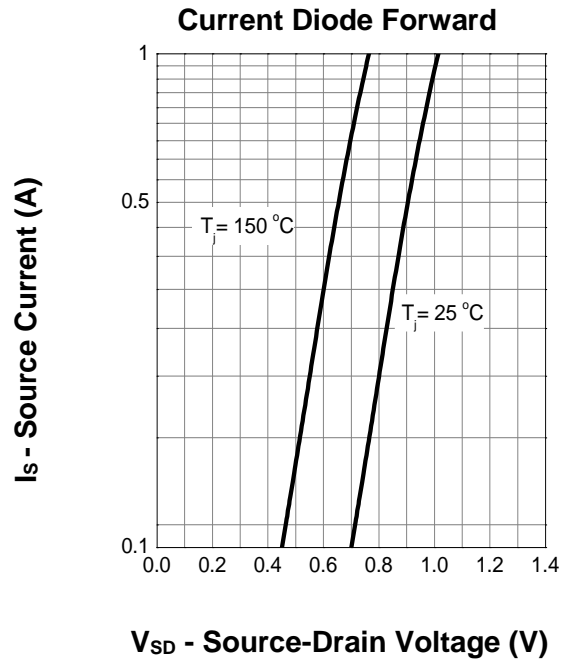
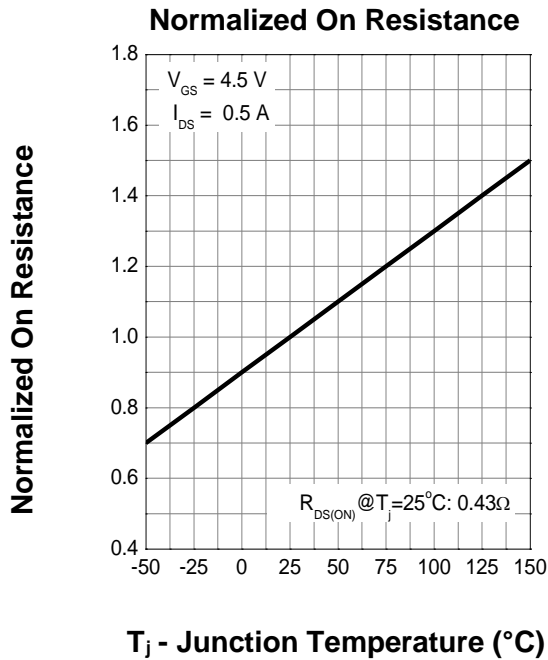


Square Wave Pulse Duration (sec)

## 7. Typical Characteristics (cont.)



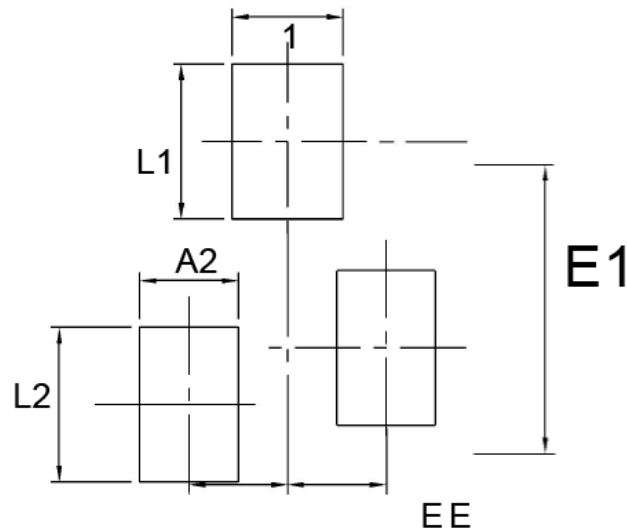
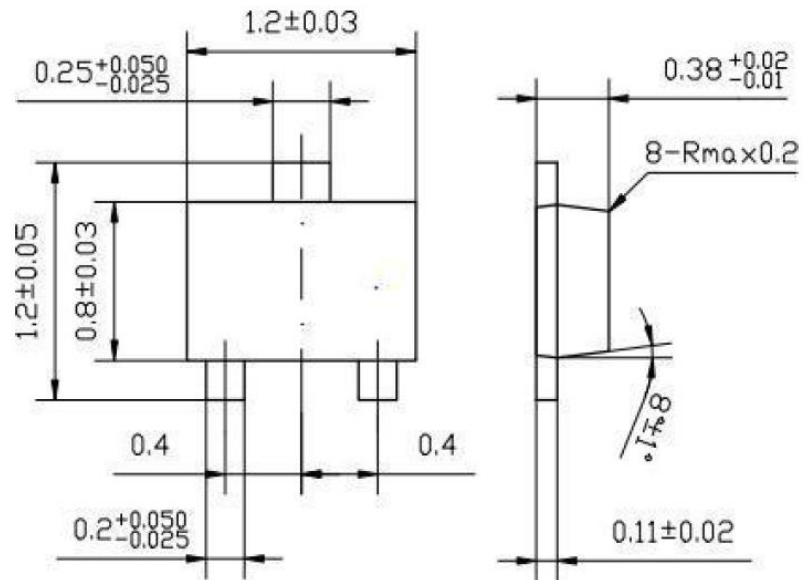
## 7. Typical Characteristics (cont.)





### 8. Package Dimensions

SOT-723 Package



Symbol	A1	A2	L1	L2	E1	E
Dimensions	0.45mm	0.40mm	0.63mm	0.63mm	1.17mm	0.40mm