

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Super Trench
- ☒ T_J max 175°C
- ☒ Advanced trench cell design
- ☒ MSL1

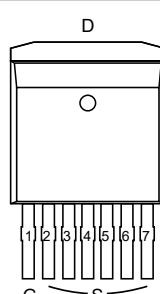
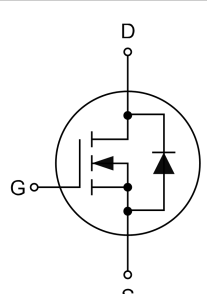
1.2 Applications

- ☒ Power appliances
- ☒ E-Tool appliances
- ☒ High power inverter system
- ☒ BMS

1.3 Quick reference

- ☒ $BV \geq 60\text{ V}$
- ☒ $P_D \leq 375\text{ W}$
- ☒ $I_D \leq 512\text{ A}$
- ☒ $R_{DS(ON)} \leq 0.55\text{ m}\Omega @V_{GS} = 10\text{ V}$
- ☒ $R_{DS(ON)} \leq 1.15\text{ m}\Omega @V_{GS} = 6\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate	 TO-263-7L Plus	
2~7	Source		
Tab	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	60	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	512	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	362	A
I_{DM}^*	Drain Current (Pulsed)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	1536	A
P_D	Drain Power Dissipation	$T_C=25^{\circ}\text{C}$	-	375	W
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	512	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=0.3\text{ mH}$	-	2100	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	175	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		-	40	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.4	$^{\circ}\text{C}/\text{W}$

Notes:

- * Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- ** Surface mounted on 1 in² pad area, $t \leq 10\text{ sec}$.
- *** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ005N06D7S	KJ005N06D7S QYWWXX XXXXXX-X

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ005N06D7S	TO-263-7L Plus	13"	24 mm	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)

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 _{DS} =250 μA	60	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} =48 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)}	On-State Resistance	V _{GS} =10 V, I _{DS} =20 A	-	0.45	0.55	mΩ
		V _{GS} =6 V, I _{DS} =10 A	-	1	1.15	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0 V, I _{SD} =20 A	-	-	1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} =0 V, I _{SD} =20 A, dI _{SD} /dt=100 A/μs	-	118	-	ns
Q _{rr}	Reverse Recovery Charge		-	392	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =30 V, V _{GS} =0 V, Frequency=1 MHz	-	17560	-	pF
C _{oss}	Output Capacitance		-	4760	-	
C _{rss}	Reverse Transfer Capacitance		-	960	-	
R _g	Gate Resistance	f=1 MHz	-	1.6	-	Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} =30 V, V _{GEN} =10 V, R _G =3.9 Ω, R _L =1.5 Ω, I _{DS} =20 A	-	46	-	ns
t _r	Turn-on Rise Time		-	73	-	
t _{d(off)}	Turn-off Delay Time		-	161	-	
t _f	Turn-off Fall Time		-	88	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =30 V, V _{GS} =10 V, I _{DS} =20 A	-	274	-	nC
Q _{gs}	Gate-Source Charge		-	96	-	
Q _{gd}	Gate-Drain Charge		-	53	-	

7. Typical Characteristics

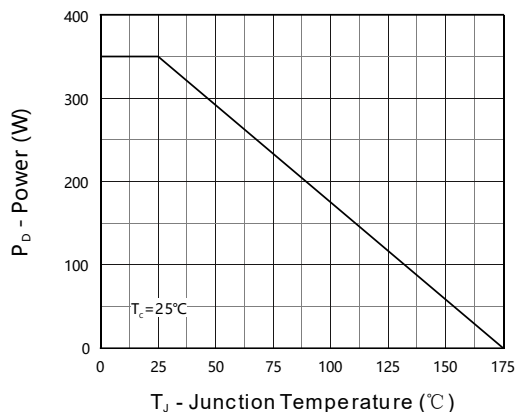


Fig 1. Power Capability

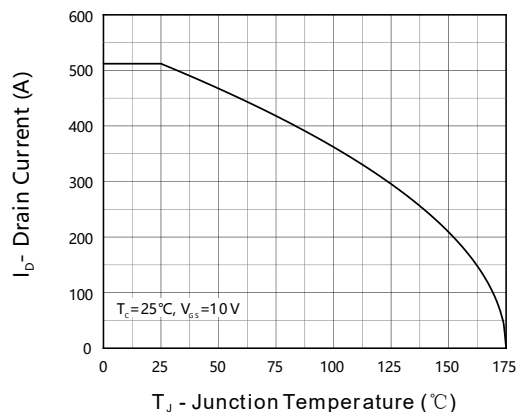


Fig 2. Current Capability

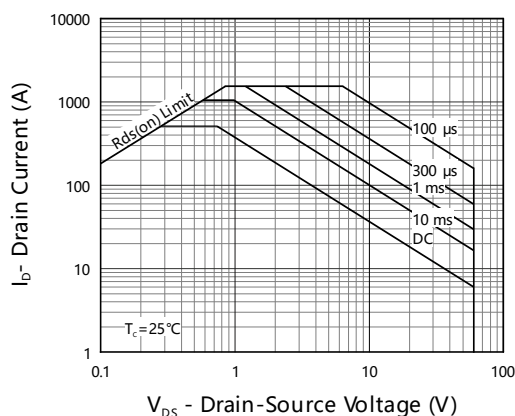


Fig 3. Safe Operation Area

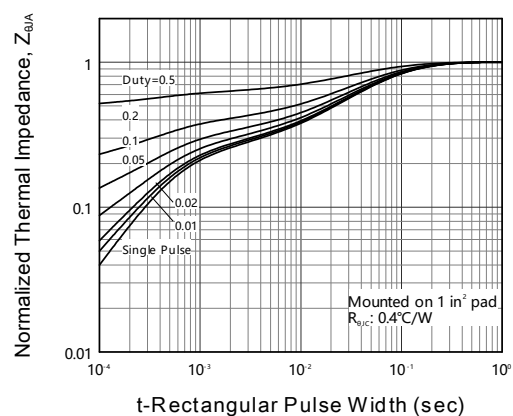


Fig 4. Normalized Maximum Transien Thermal Impedance

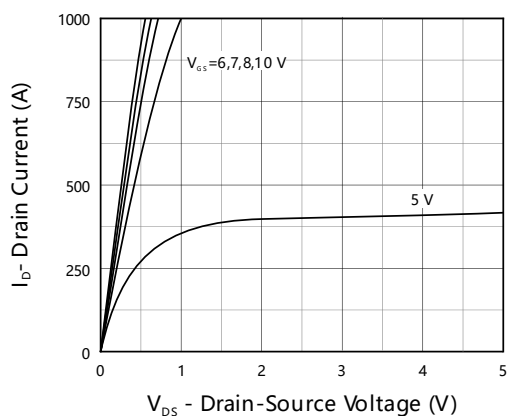


Fig 5. Output Characteristics

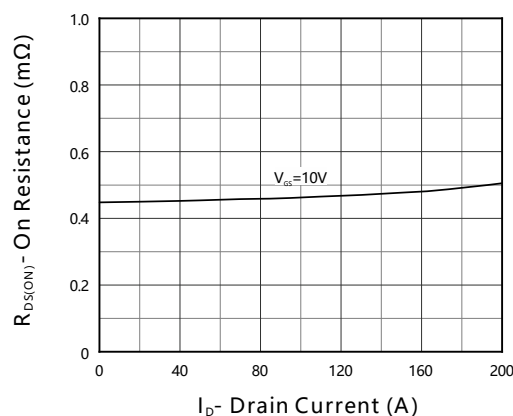


Fig 6. On Resistance

7. Typical Characteristics (cont.)

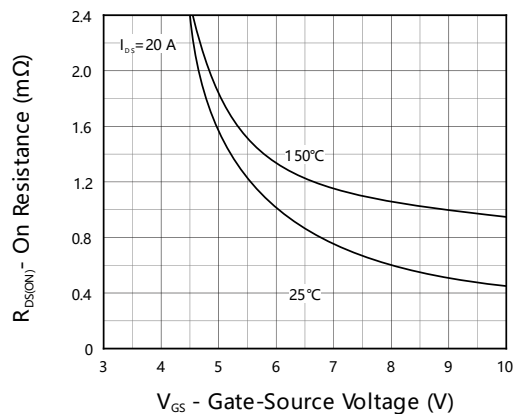


Fig 7. Transfer Characteristics

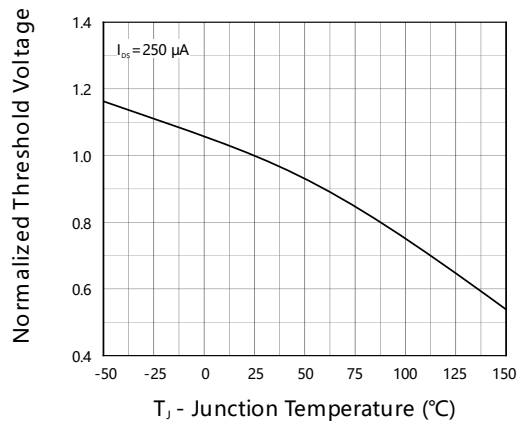


Fig 8. Normalized Threshold Voltage

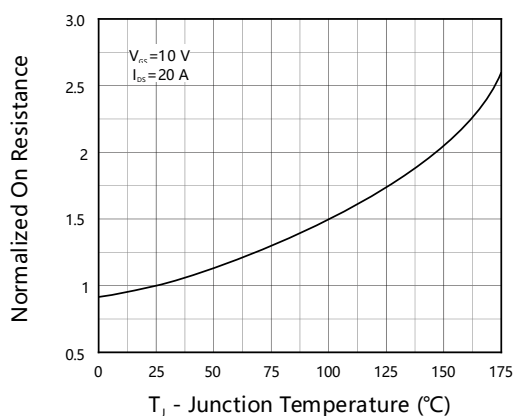


Fig 9. Normalized On Resistance

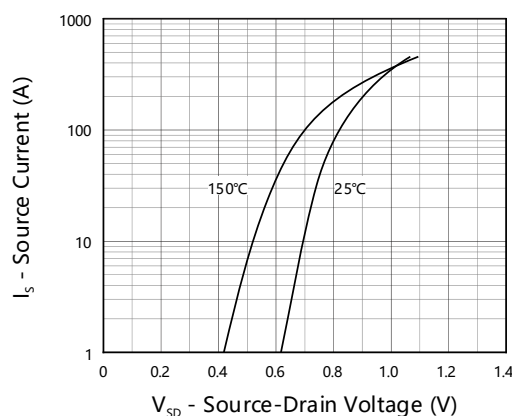


Fig 10. Diode Forward Current

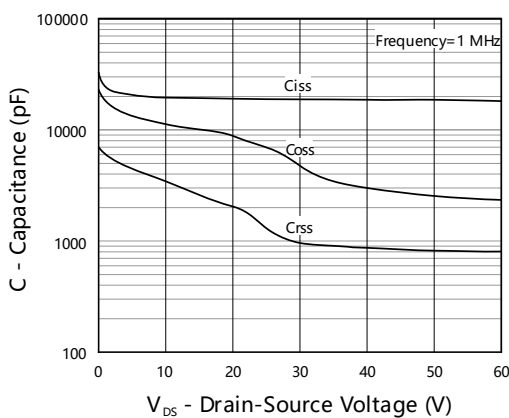


Fig 11. Capacitance

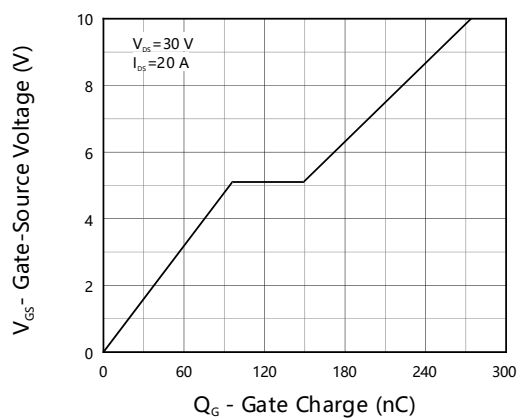
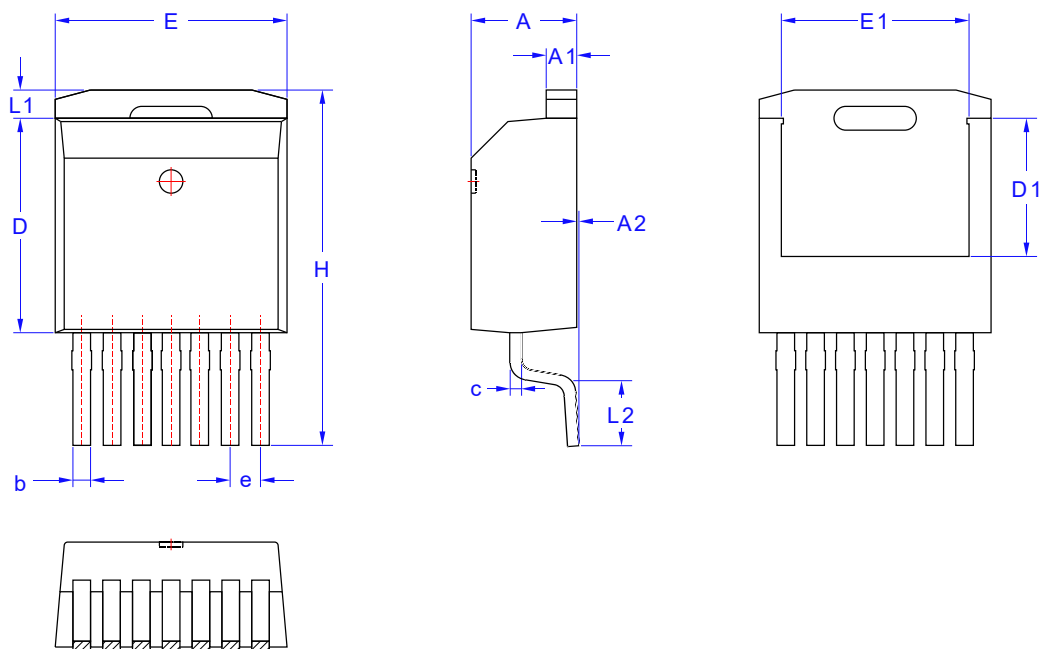


Fig 12. Gate Charge

8. Package Dimensions

TO-263-7L Plus Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	4.30	4.43	4.56
A1	1.20	1.30	1.40
A2	2.45	2.60	2.75
A3	0.00	0.13	0.25
b	0.50	0.60	0.70
b1	0.60	0.70	0.90
c	0.45	0.50	0.60
D	9.08	9.08	9.08
D1	4.65	4.80	4.95
E	10.08	10.18	10.28
E1	6.82	7.22	7.62
e		1.27 BSC	
H	15.00	15.50	16.00
L1	0.98	1.20	1.42
L2	1.90	2.20	2.50
θ	3°	5°	7°