

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ SGT Technology
- ☒ Low gate charge
- ☒ MSL1
- ☒ Excellent $R_{DS(ON)}$
- ☒ T_J 175°C

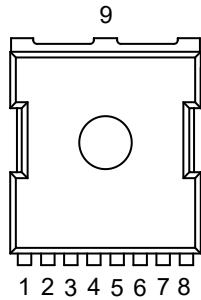
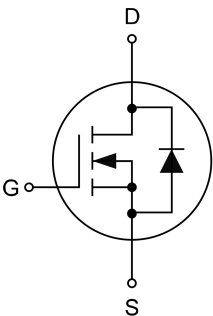
1.2 Applications

- ☒ Load switch for portable device
- ☒ BMS
- ☒ DC/DC Converter
- ☒ High power inverter system

1.3 Quick reference

- ☒ $BV \geq 100\text{ V}$
- ☒ $P_D \leq 231\text{ W}$
- ☒ $I_D \leq 143\text{ A}$
- ☒ $R_{DS(ON)} \leq 5\text{ m}\Omega @ V_{GS} = 10\text{ V}$

2. Pin Description

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

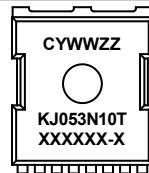
3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	100	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	143	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	101	A
I_{DM}^*	Drain Current (Pulsed)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	572	A
P_D	Drain Power Dissipation	$T_C=25^{\circ}\text{C}$	-	231	W
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	143	A
E_A	Single Pulsed Avalanche Energy	$T_J=25^{\circ}\text{C}, V_{DD}=50\text{ V},$ $R_G=25\ \Omega, L=0.5\text{ mH}$	-	500	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.65	$^{\circ}\text{C}/\text{W}$

Notes:

- * Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- ** Surface mounted on 1 in² pad area, $t \leq 10\text{ sec}$.
- *** Repetitive Rating: pulse width limited by maximum junction temperature.

4. Marking Information

Product Name	Marking
KJ053N10T	

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ053N10T	TOLL-8L	13"	24 mm	2000

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	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	3	4	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} =100 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate-Body 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	-	4.1	5.0	mΩ
R _G	Gate Resistance	f=1 MHz	-	1	-	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =40 V, f=1 MHz	-	7150	-	pF
C _{oss}	Output Capacitance		-	3230	-	
C _{rss}	Reverse Transfer Capacitance		-	156	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =50 V, R _L =2.5 Ω, V _{GS} =10 V, R _G =6 Ω	-	22	-	ns
t _r	Turn-on Rise Time		-	38	-	
t _{d(off)}	Turn-off Delay Time		-	48	-	
t _f	Turn-off Fall Time		-	33	-	
Q _g	Total Gate Charge	V _{DS} =50 V, V _{GS} =10 V, I _{DS} =20 A	-	55	-	nC
Q _{gs}	Gate-Source Charge		-	16	-	
Q _{gd}	Gate-Drain Charge		-	14	-	
Source-Drain Diode Characteristics						
V _{DS} ^a	Diode Forward Voltage	V _{GS} =0 V, I _{DS} =20 A	-	0.85	1.2	V
t _{rr}	Reverse Recovery Time	I _{DS} =20 A, V _{GS} =0 V, dI _F /dt=100 A/μs	-	62	-	ns
Q _{rr}	Reverse Recovery Charge		-	95	-	nC

7. Typical Characteristics

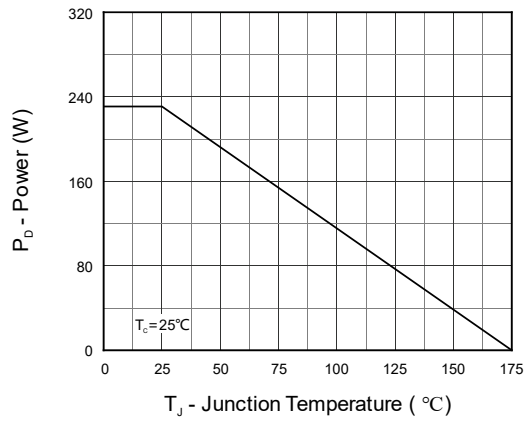


Figure 1. Power Capability

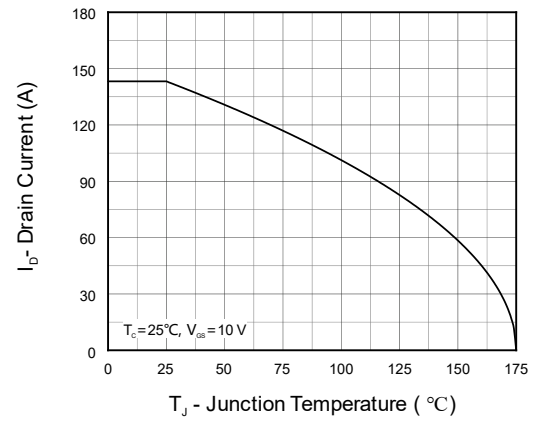


Figure 2. Current Capability

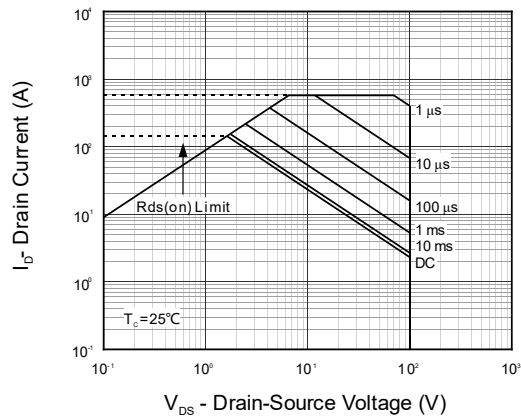


Figure 3. Safe Operation Area

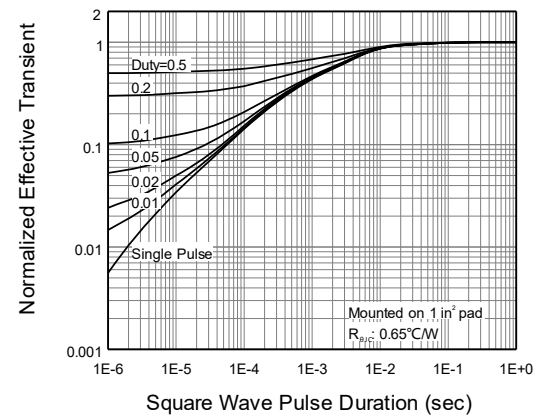


Figure 4. Transient Thermal Impedance

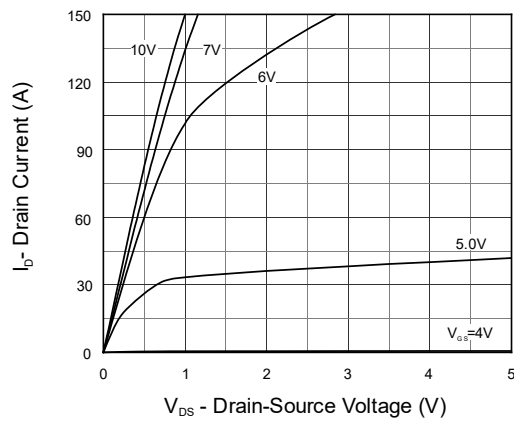


Figure 5. Output Characteristics

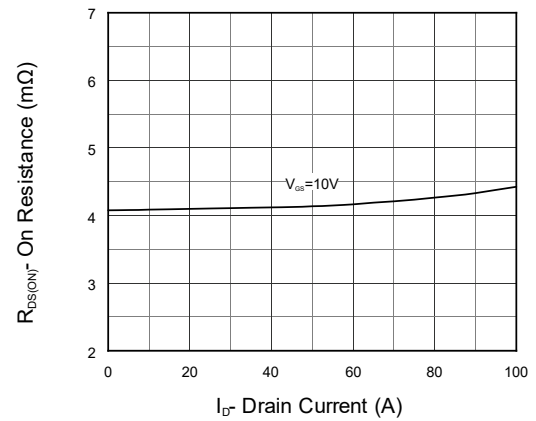


Figure 6. On Resistance

7. Typical Characteristics (cont.)

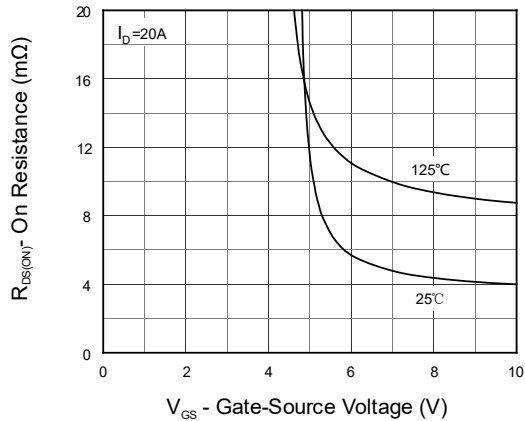


Figure 7. Transfer Characteristics

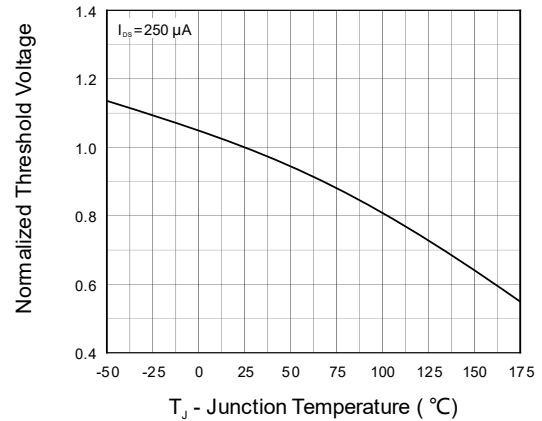


Fig 8. Normalized Threshold Voltage

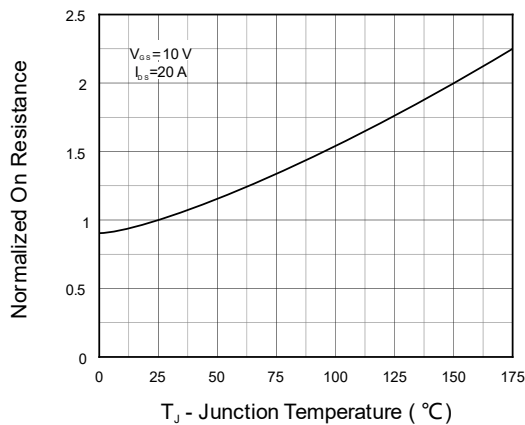


Fig 9. Normalized On Resistance

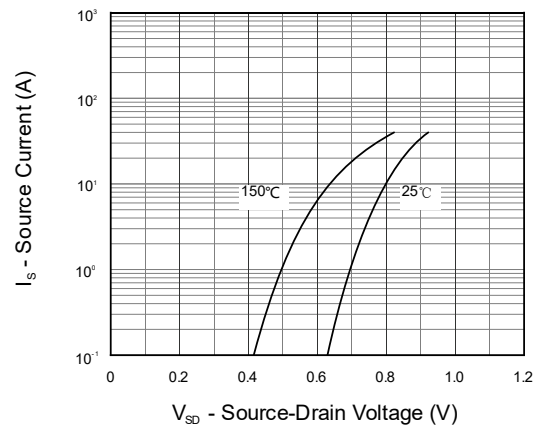


Figure 10. Diode Forward Current

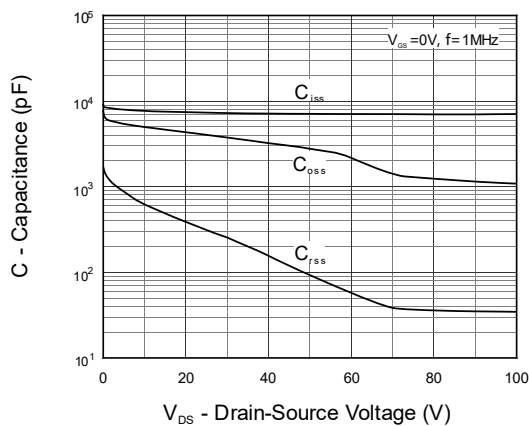


Figure 11. Capacitance

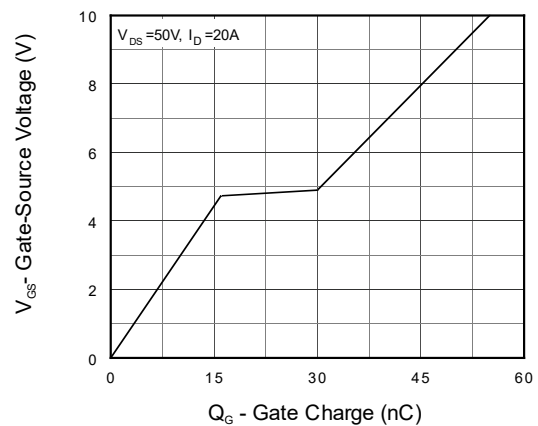
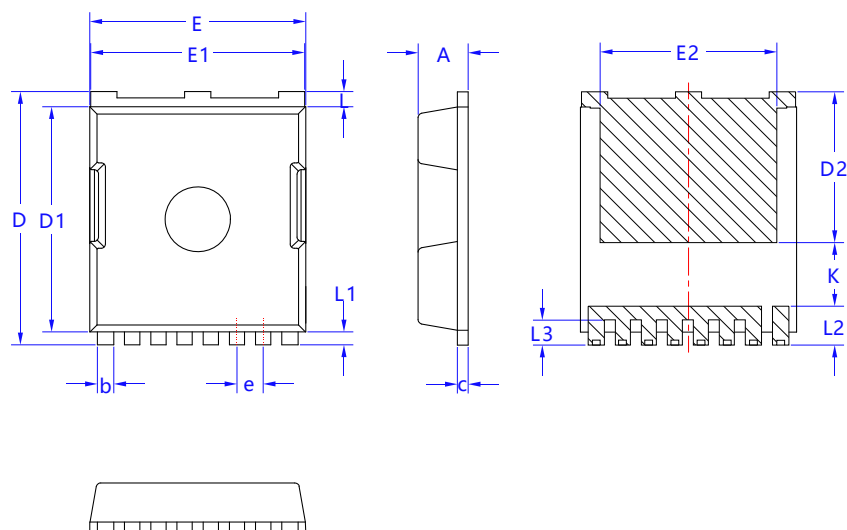


Figure 12. Gate Charge

8. Package Dimensions

TOLL-8L Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.60	0.70	0.90
c	0.40	0.50	0.60
D	11.48	11.68	11.88
D1	10.28	10.38	10.55
D2	6.85	6.95	7.05
E	9.80	9.90	10.0
E1	9.70	9.80	9.90
E2	8.00	8.10	8.20
e	1.20 BSC		
L	0.60 TYPE		
L1	0.60 TYPE		
L2	1.60	1.80	2.10
L3	1.00	1.15	1.30
K	2.90 TYPE		