

Super-Junction Power Mosfet

1. Product Information

Features

- Ultra-fast body diode
- Good Reliability
- 100% UIS and isolation tested
- RoHs compliant

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

Quick reference

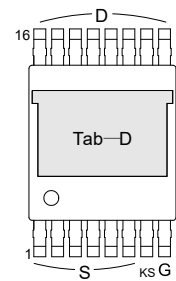
- $V_{DS} = 600V$
- $I_D = 70A$
- $R_{DS(ON)} \leq 38m\Omega @ V_{GS}=10V$ (Type: 33m Ω)

Pin Description

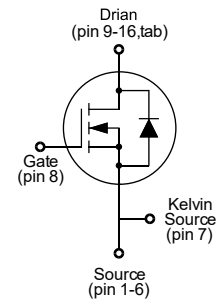
Pin	Description
1~6	Source
7	Kelvin Source
8	Gate
9~16, Tab	Drain

Simplified Outline

Symbol



TOLT-16L



Package Marking and Ordering Information

Part number	Marking	Package	Packaging	Quantity	Reel size	Tape width
KJCF60R033LT1	KJCF60R033LT1	TOLT-16L	☒ Tape & Reel	1000PCS	13"	24 mm
			☐ Tube	N/A	N/A	N/A

2. Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current, T _A =25°C, V _{GS} @10V ¹	70	A
	Continuous Drain Current, T _A =100°C, V _{GS} @10V ¹	50	A
I_{DM}	Pulsed Drain Current ^{1,2}	280	A
E_{AS}	Single Pulse Avalanche Energy ³	1200	mJ
P_D	Power Dissipation	429	W
dv/dt	Reverse diode dv/dt	50	V/ns
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient, Steady-State ⁴	48	°C/ W
$R_{\theta JC}$	Thermal Resistance from Junction to Case, Steady-State ⁴	0.35	°C/ W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55~175	°C

3. Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	600	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V, T _J =125°C	-	-	5	μA
I _{GSS}	Gate-body Leakage current	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	3.0	3.6	4.2	V
R _{DS(on)}	Drain-Source on-Resistance	V _{GS} =10V, I _D =25A	-	33	38	mΩ
Dynamic characteristics						
C _{iss}	Input Capacitance	V _{DS} =100V, V _{GS} =0V, f=100KHz	-	5125	-	pF
C _{oss}	Output Capacitance		-	220	-	
C _{rss}	Reverse Transfer Capacitance		-	10	-	
Switching characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =480V, I _D =25A, R _G =27Ω, V _{GS} =10V	-	170	-	ns
t _r	Turn-on Rise Time		-	117	-	
t _{d(off)}	Turn-off Delay Time		-	598	-	
t _f	Turn-off Fall Time		-	133	-	
Q _g	Total Gate Charge	V _{DS} =480V, I _D =25A, V _{GS} =10V	-	203	-	nC
Q _{gs}	Gate-Source Charge		-	48	-	
Q _{gd}	Gate-Drain Charge		-	127	-	
Source-Drain Diode characteristics						
V _{SD}	Diode Forward Voltage	I _S =25A, V _{GS} =0V	-	0.9	1.2	V
Q _{rr}	Reverse Recovery Charge	V _R =400V, I _F =25A, di _F /dt=100A/us	-	1.5	-	μC
t _{rr}	Reverse Recovery Time		-	188	-	ns

Notes:

1. The max drain current rating limited by package and maximum junction temperature.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. E_{AS} Condition: T_J=25°C, V_{DD}=100V, R_G=25Ω, L=30mH, I_{AS}=10A.
4. Mount on minimum PCB layout.

4. Electrical Characteristics

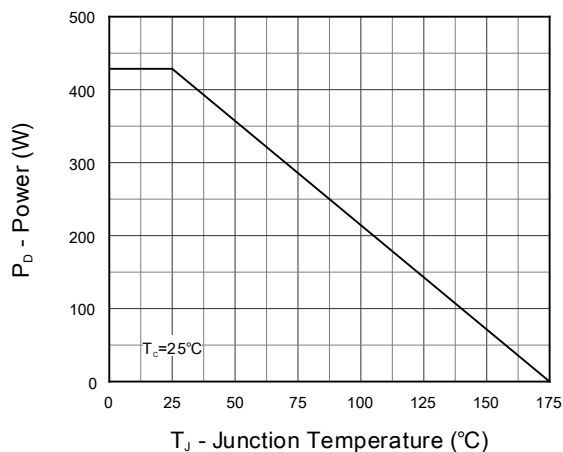


Fig 1. Power Capability

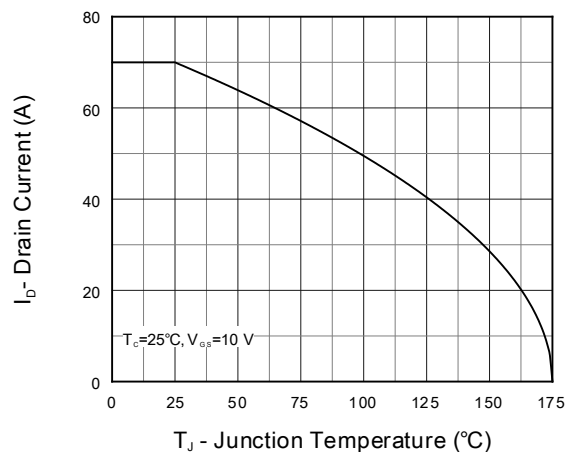


Fig 2. Current Capability

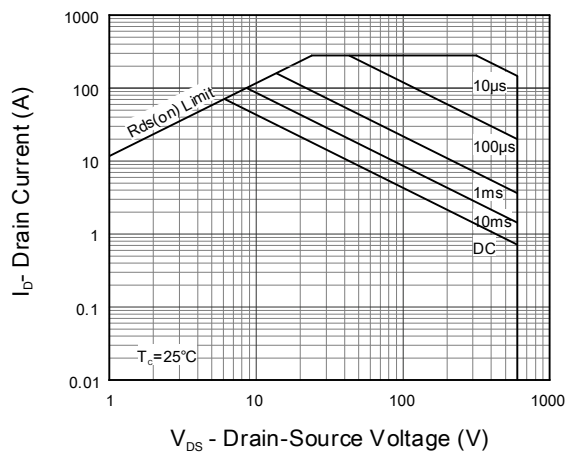


Fig 3. Safe Operation Area

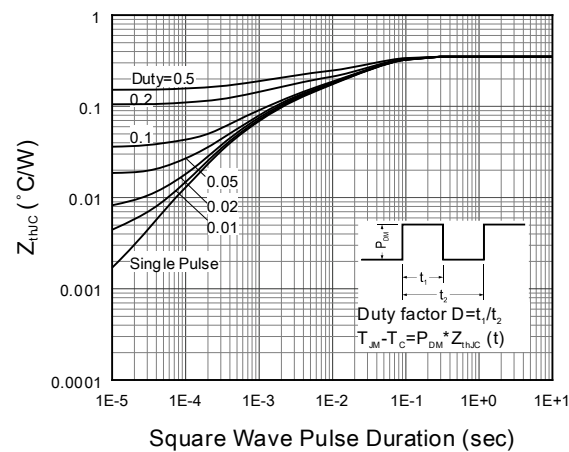


Fig 4. Transient Thermal Impedance

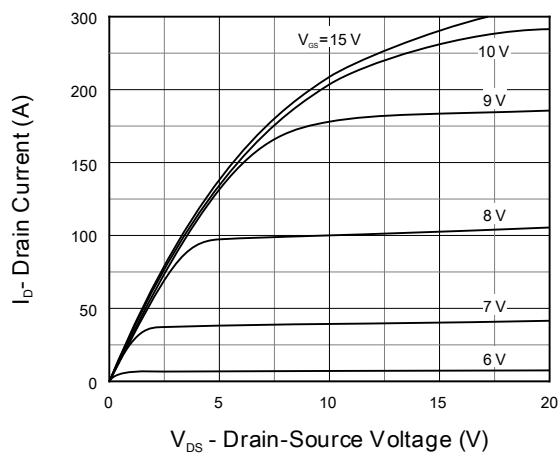


Fig 5. Output Characteristics
 $T_J=25^{\circ}\text{C}$

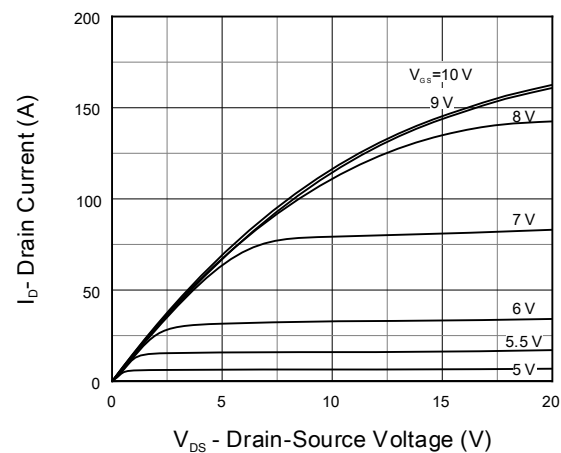
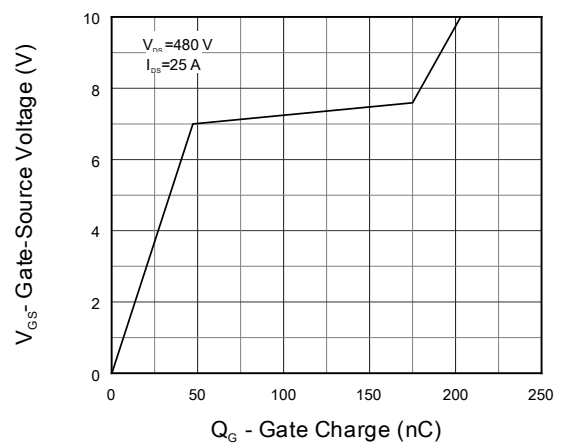
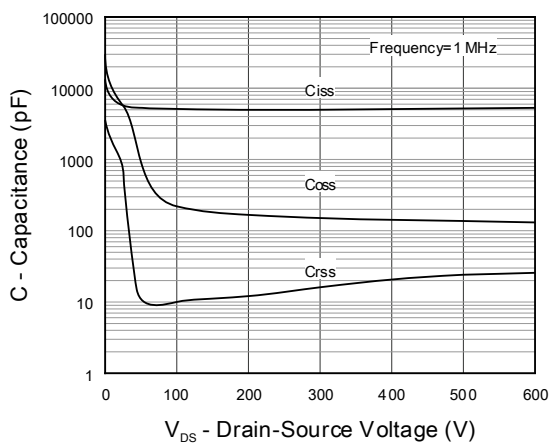
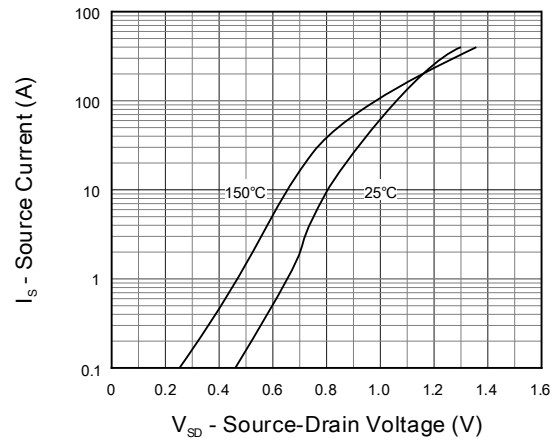
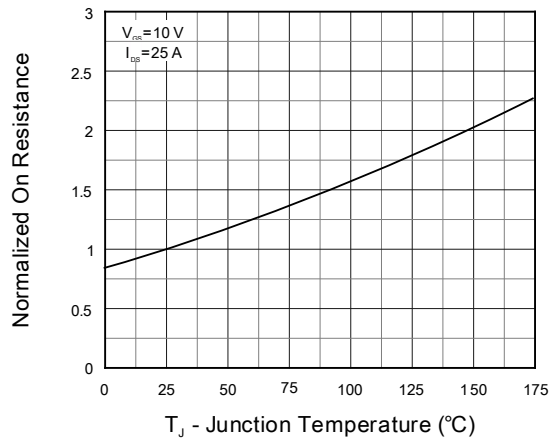
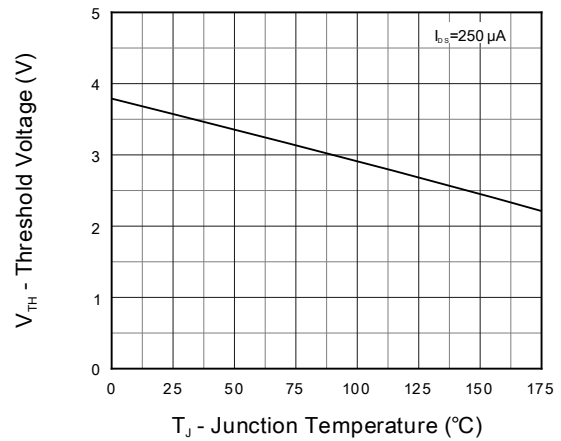
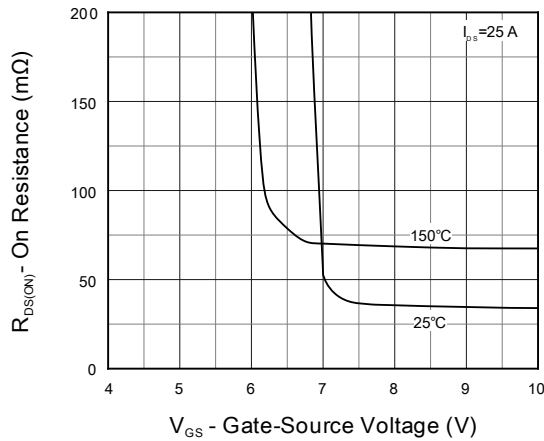


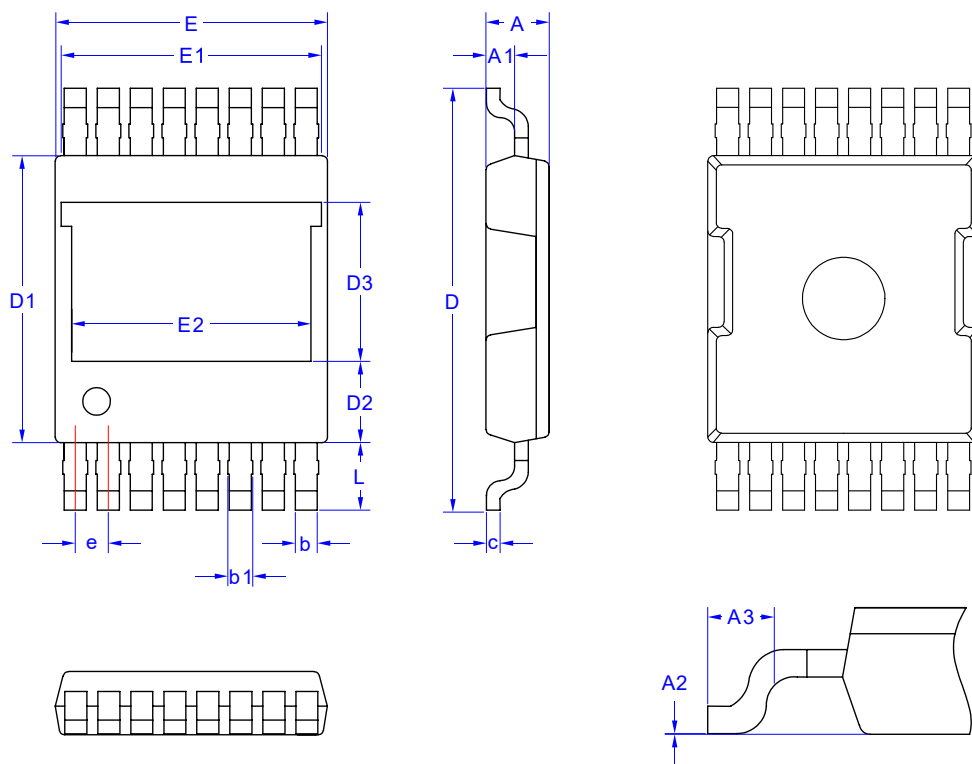
Fig 6. Output Characteristics
 $T_J=150^{\circ}\text{C}$

4. Electrical Characteristics (cont.)



5. Package Mechanical Data

TOLT-16L Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.99	1.04	1.09
A2	0.00	0.08	0.16
A3	1.50 REF		
b	0.70	0.75	0.80
b1	0.65	0.70	0.75
c	0.45	0.50	0.55
D	14.50	15.00	15.50

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
D1	9.60	10.10	10.60
D2	2.30	2.80	3.30
D3	5.77 REF		
E	9.40	9.90	10.40
E1	9.46 REF		
E2	8.70 REF		
e	1.15	1.20	1.25
L	2.40	2.45	2.50