

Silicon Carbide Power Mosfet

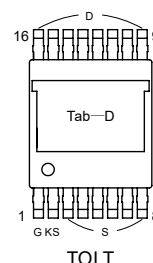
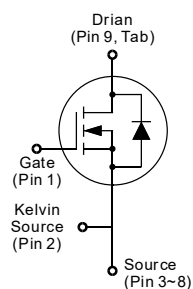
1. Product Information

Features

- 650V, 35mΩ, 67A, N-Channel SiC MOS
- Low loss, fast switching speeds with low R_G
- Flexible gate voltage range ($V_{GS}=15V$ to $18V$)
- Robust body diode and low Q_{rr}

Applications

- EV charger
- Solar inverters
- Switch mode power supplies
- Motor drives
- UPS



Package Marking and Ordering Information

Product Name	Package	Marking	Packing	Quantity (pcs)
KJSC65R035LT1	TOLT-16L	KJSC65R035LT1	Tape & Reel	1200

2. Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	650	V
I_D	Continuous Drain Current, $T_C=25^{\circ}C$	67	A
	Continuous Drain Current, $T_C=100^{\circ}C$	48	A
I_{DM}	Peak Drain Current, Pulse width t_p limited by T_{jmax}	268	A
P_D	Power Dissipation	357	W
E_{AS}	Single Pulsed Avalanche Energy $V_{DS}=50$ V, $L=10$ mH, $R_G=25$ Ω	592	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 175	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	55	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.42	$^{\circ}C/W$

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

Symbol	Parameter	Test Conditions	Min	Type	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	650	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650 V, V _{GS} =0 V	-	-	100	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0 V, V _{GS} =-5 to 15 V,	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =30 mA	3.5	-	4.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =18 V, I _D =34 A	-	30	35	mΩ
		V _{GS} =18 V, I _D =34 A, T _J =150℃	-	65	-	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =400 V, V _{GS} =0 V, f=1 MHz	-	7250	-	pF
C _{oss}	Output Capacitance		-	120	-	pF
C _{rss}	Reverse Transfer Capacitance		-	25	-	pF
R _G	Gate Resistance	f=1 MHz	-	4	-	Ω
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =400 V, I _D =34 A, V _{GS} =-5/+18 V	-	205	-	nC
Q _{gs}	Gate-Source Charge		-	66	-	nC
Q _{gd}	Gate-Drain Charge		-	44	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =400 V, I _D =34 A, V _{GS} =-5/+18 V, R _G =2.5 Ω, L=200 μH	-	64	-	ns
t _r	Turn-on Rise Time		-	24	-	ns
t _{d(off)}	Turn-off Delay Time		-	163	-	ns
t _f	Turn-off Fall Time		-	22	-	ns
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =-5 V, I _S =34 A	-	3	-	V
T _{rr}	Reverse Recovery Time	V _R =400 V, I _F =34 A, di _F /dt=100 A/μs	-	229	-	ns
I _{rrm}	Peak Reverse Recovery Current		-	14	-	A
Q _{rr}	Reverse Recovery Charge		-	2.1	-	nC

4. Typical Characteristics

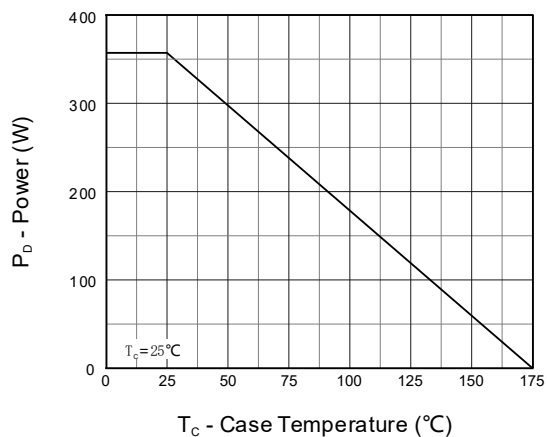


Fig 1. Power Capability

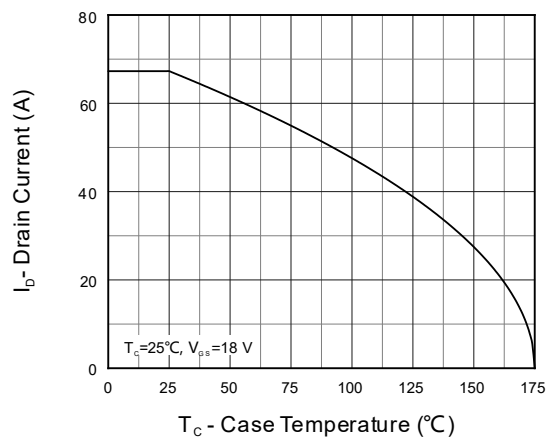


Fig 2. Current Capability

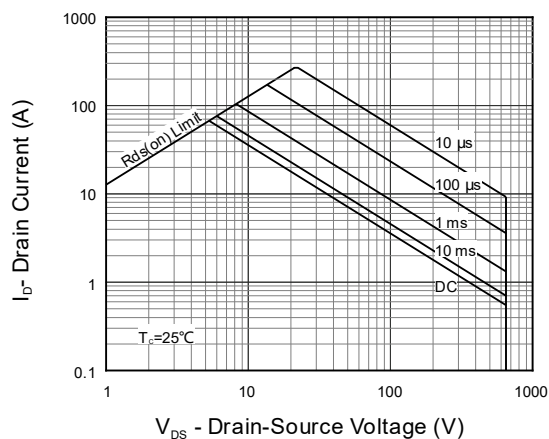


Fig 3. Safe Operation Area

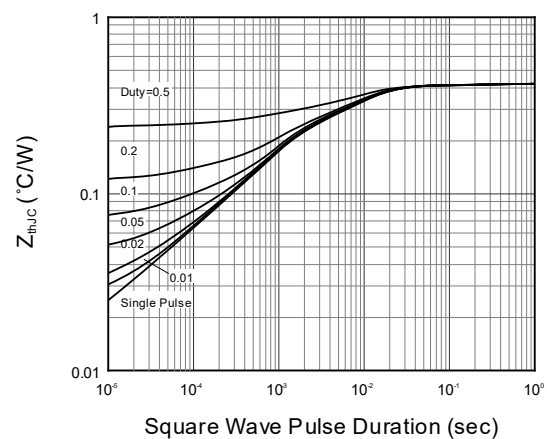
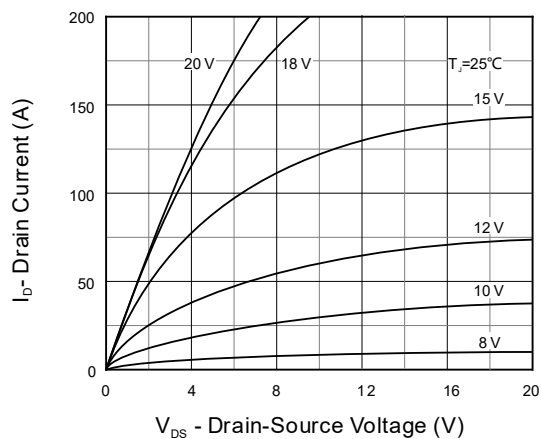
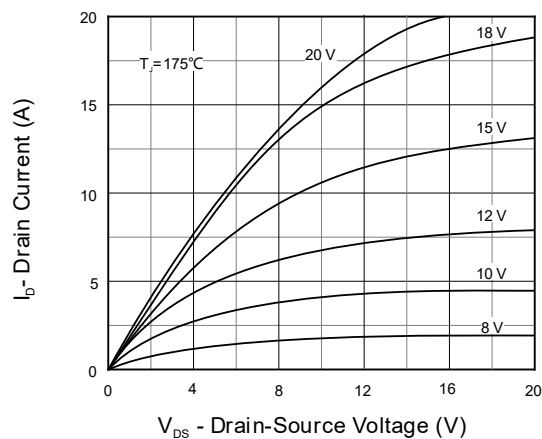


Fig 4. Transient Thermal Impedance



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



**Fig 6. Output Characteristics
 $T_J = 175^{\circ}\text{C}$**

4. Typical Characteristics(cont.)

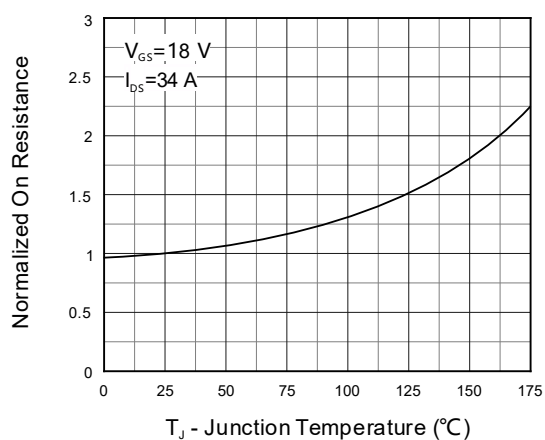


Fig 7. Normalized On Resistance

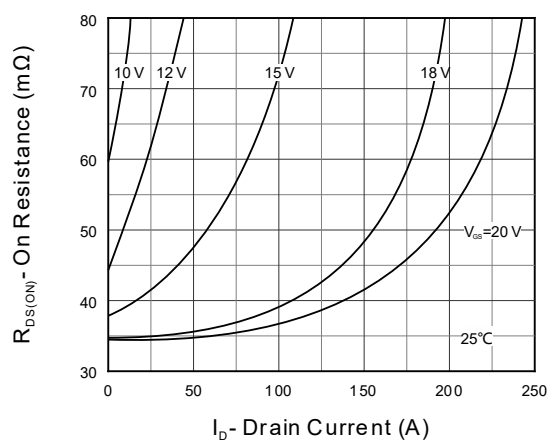


Fig 8. On Resistance vs. I_D

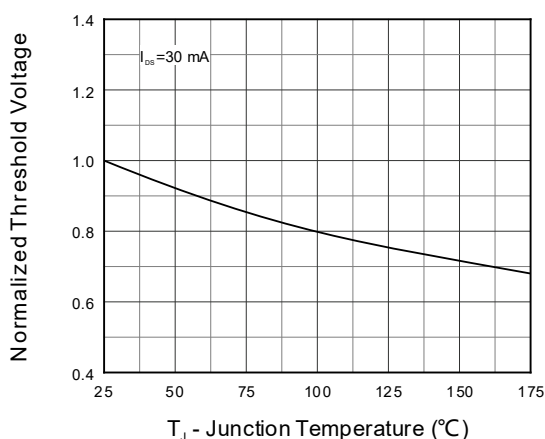


Fig 9. Normalized Threshold Voltage

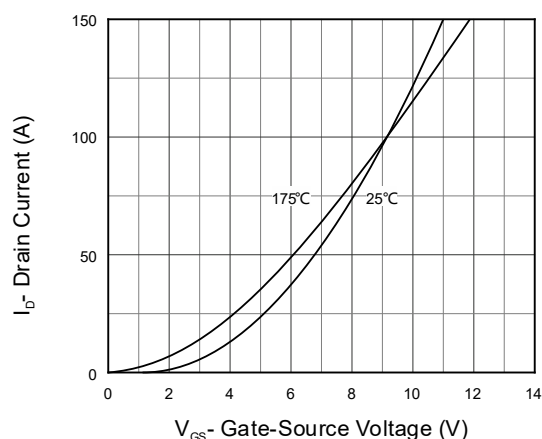


Fig 10. Diode Forward Current

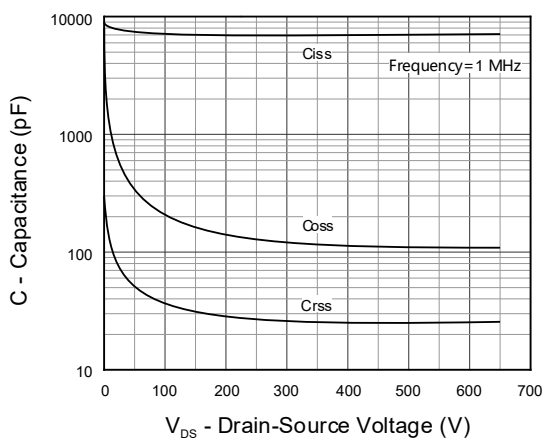


Fig 11. Capacitance

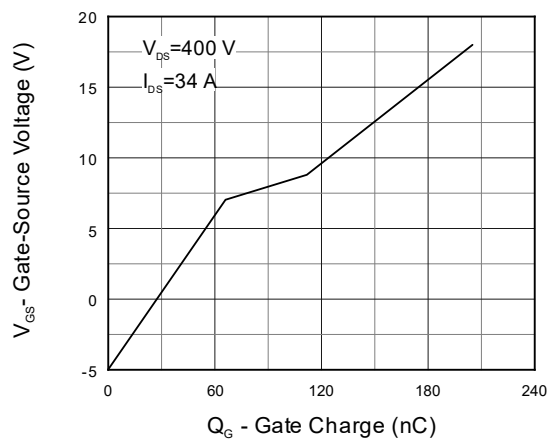
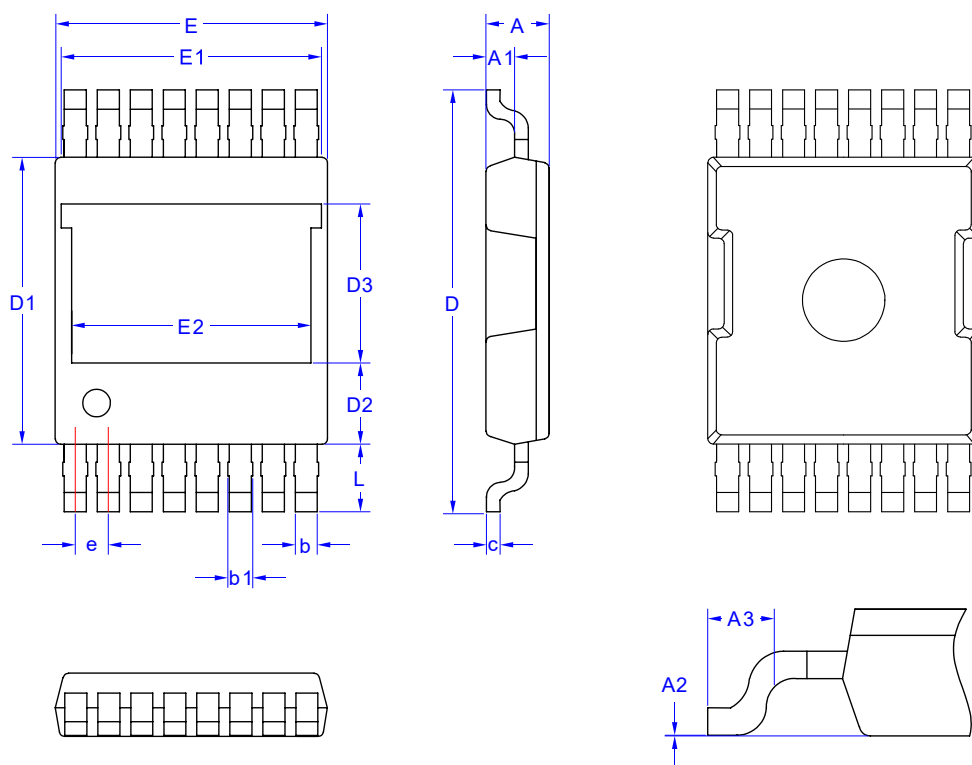


Fig 12. Gate Charge

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