

Silicon Carbide Power Mosfet

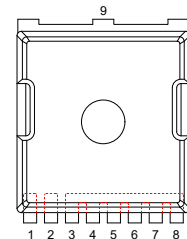
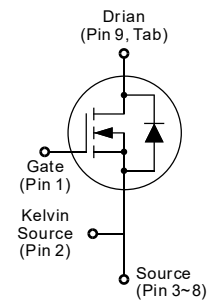
1. Product Information

Features

- 650V, 95mΩ, 40A, 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



TOLL B-8L

Package Marking and Ordering Information

Product Name	Package	Marking	Packing	Quantity (pcs)
KJSC65R090TB	TOLL B-8L	KJSC65R090TB	Tape & Reel	2000

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, $T_C=25^{\circ}C$	40	A
	Continuous Drain Current, $T_C=100^{\circ}C$	28	A
I_{DM}	Peak Drain Current, Pulse width t_p limited by T_{Jmax}	160	A
P_D	Power Dissipation	214	W
E_{AS}	Single Pulsed Avalanche Energy, $V_{DS}=50$ V, $L=5$ mH, $R_G=25$ Ω	257	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 175	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	72	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.7	$^{\circ}C/W$

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} =520 V, V _{GS} =0 V	-	-	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0 V, V _{GS} =-8 to 17 V,	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =2.5 mA	2	-	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =18 V, I _D =10 A	-	88	95	mΩ
		V _{GS} =18 V, I _D =10 A, T _J =150℃	-	175	-	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100 V, V _{GS} =0 V, f=1 MHz	-	748	-	pF
C _{oss}	Output Capacitance		-	85	-	pF
C _{rss}	Reverse Transfer Capacitance		-	10	-	pF
R _G	Gate Resistance	f=1 MHz	-	13.5	-	Ω
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =400 V, I _D =10 A, V _{GS} =-5/+18 V	-	58	-	nC
Q _{gs}	Gate-Source Charge		-	13	-	nC
Q _{gd}	Gate-Drain Charge		-	12	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =400 V, I _D =10 A, V _{GS} =-5/+18 V, R _G =2.5 Ω, L=200 μH	-	26	-	ns
t _r	Turn-on Rise Time		-	4	-	ns
t _{d(off)}	Turn-off Delay Time		-	16	-	ns
t _f	Turn-off Fall Time		-	8	-	ns
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =5 V, I _S =5 A	-	3.2	-	V
T _{rr}	Reverse Recovery Time	V _R =400 V, I _F =10 A, di _F /dt=100 A/μs	-	26	-	ns
I _{rrm}	Peak Reverse Recovery Current		-	8	-	A
Q _{rr}	Reverse Recovery Charge		-	50	-	nC

4. Typical Characteristics

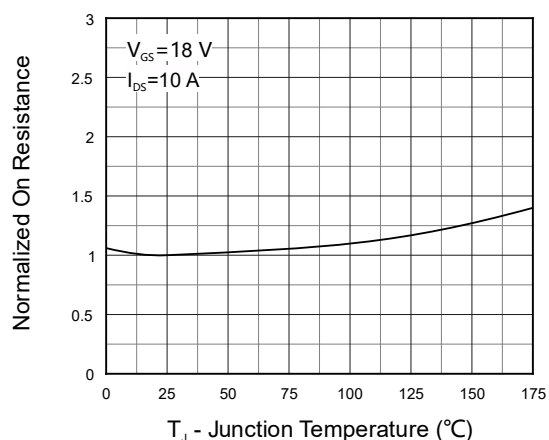


Fig 7. Normalized On Resistance

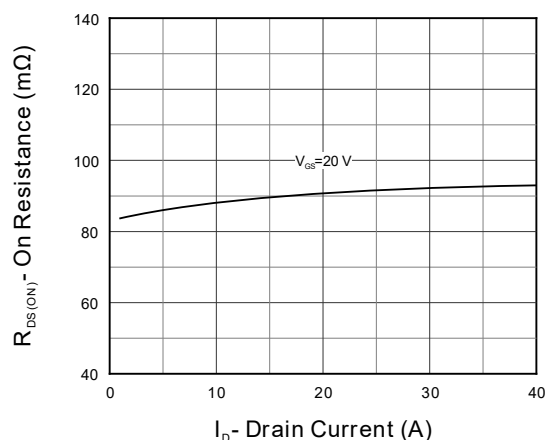


Fig 8. On Resistance vs. I_D

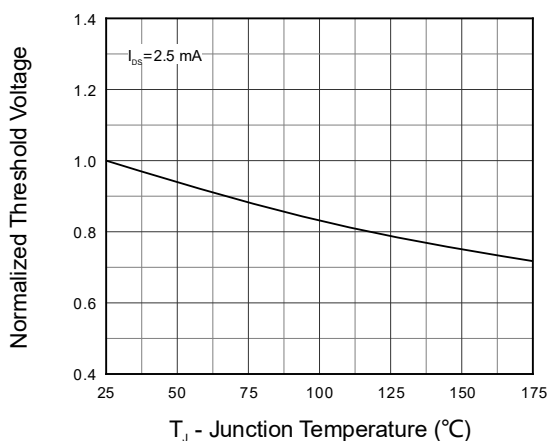


Fig 9. Normalized Threshold Voltage

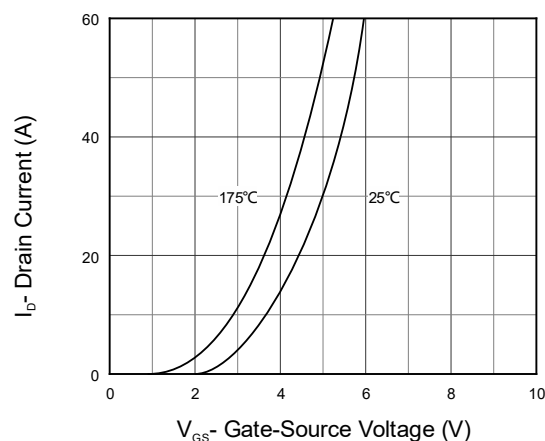


Fig 10. Diode Forward Current

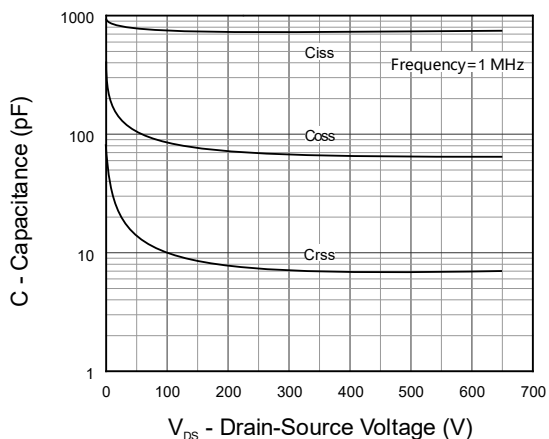


Fig 11. Capacitance

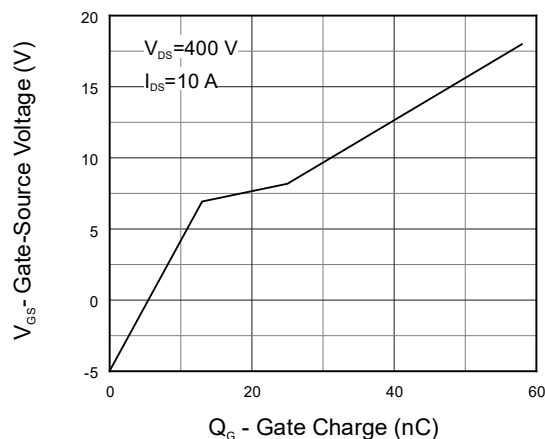


Fig 12. Gate Charge

4. Typical Characteristics(cont.)

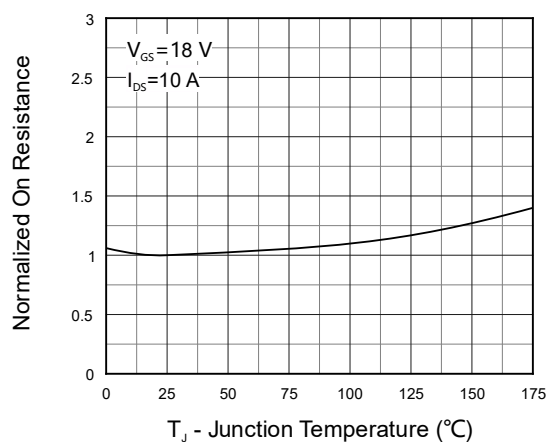


Fig 7. Normalized On Resistance

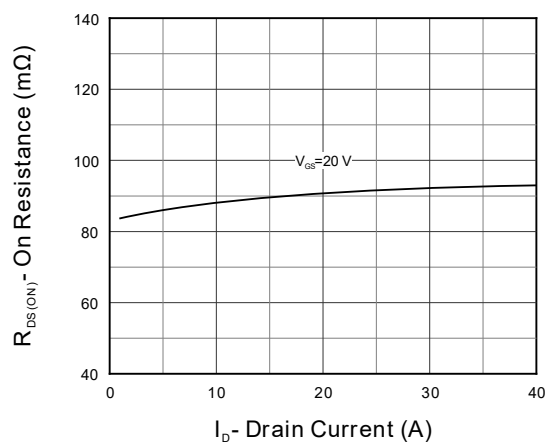


Fig 8. On Resistance vs. I_D

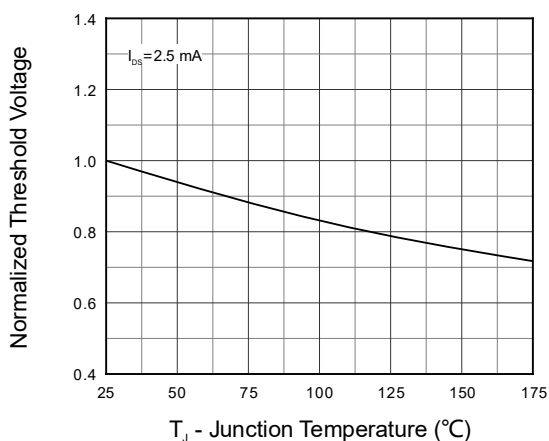


Fig 9. Normalized Threshold Voltage

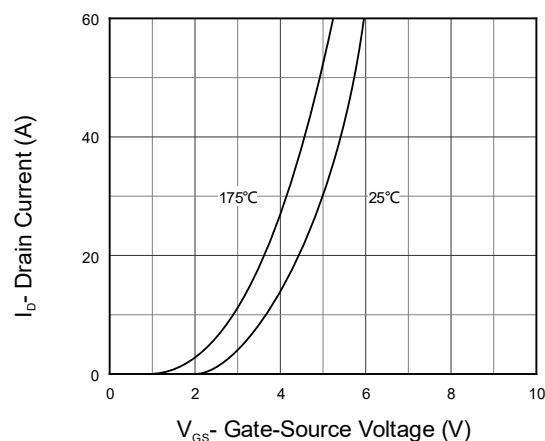


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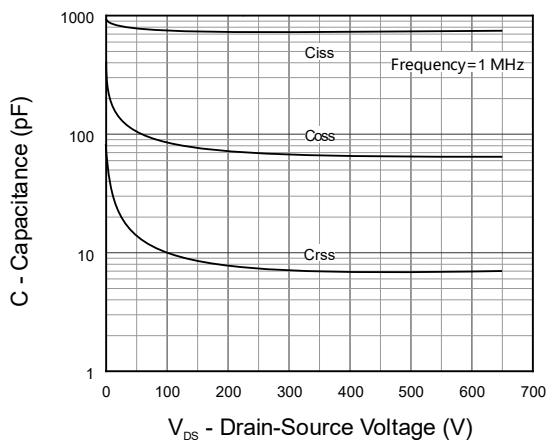


Fig 11. Capacitance

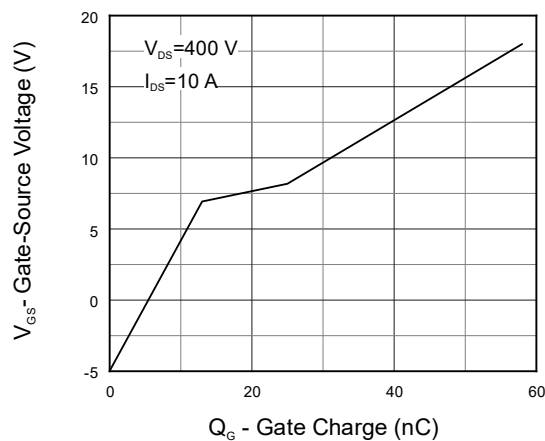
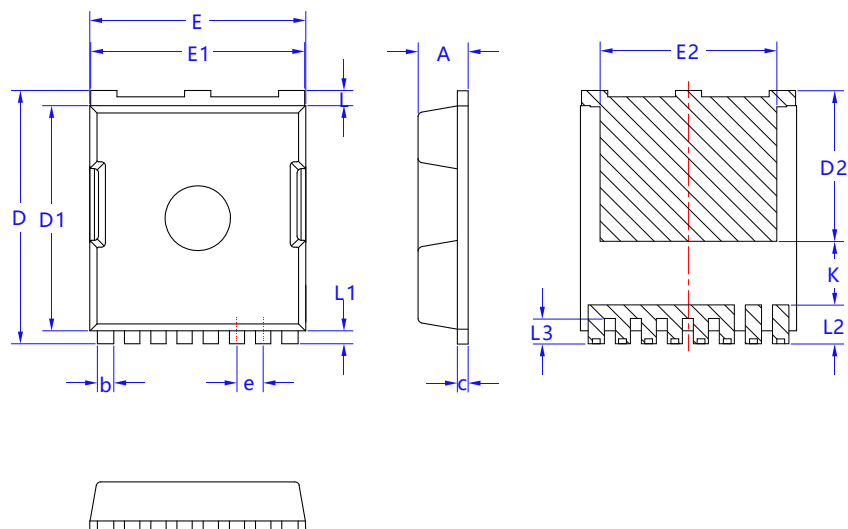


Fig 12. Gate Charge

5. Package Mechanical Data

TOLL B-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		