

Silicon Carbide Power Mosfet

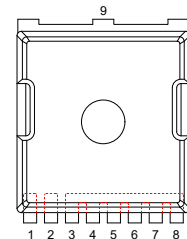
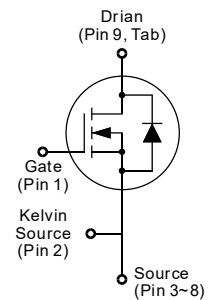
1. Product Information

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



TOLL B-8L

Package Marking and Ordering Information

Product Name	Package	Marking	Packing	Quantity (pcs)
KJSC65R035TB	TOLL B-8L	KJSC65R035TB	Tape & Reel	2000

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	650	V
I_D	Continuous Drain Current, $T_C=25^\circ\text{C}$	67	A
	Continuous Drain Current, $T_C=100^\circ\text{C}$	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 $V_{DS}=50\text{ V}$, $L=10\text{ mH}$, $R_G=25\ \Omega$	592	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.42	$^\circ\text{C/W}$

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

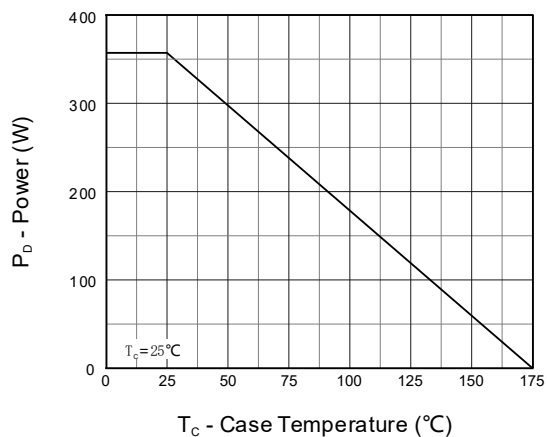


Fig 1. Power Capability

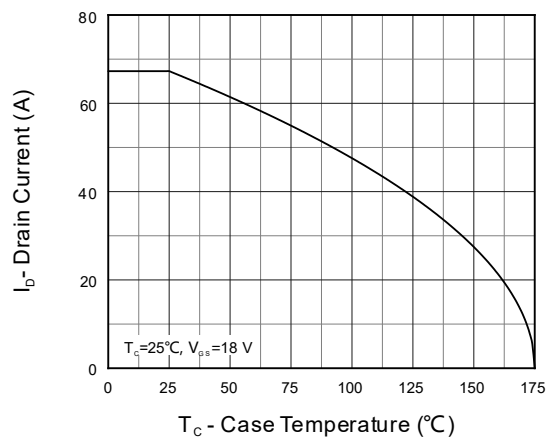


Fig 2. Current Capability

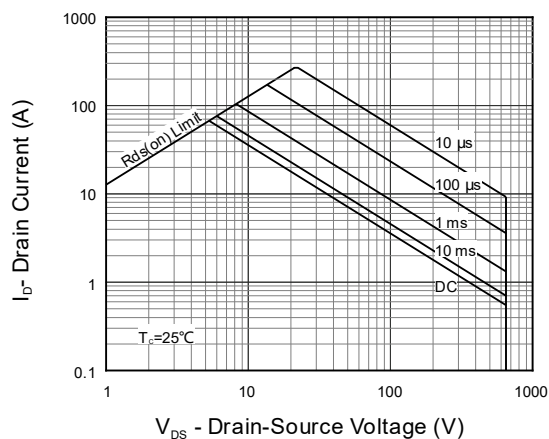


Fig 3. Safe Operation Area

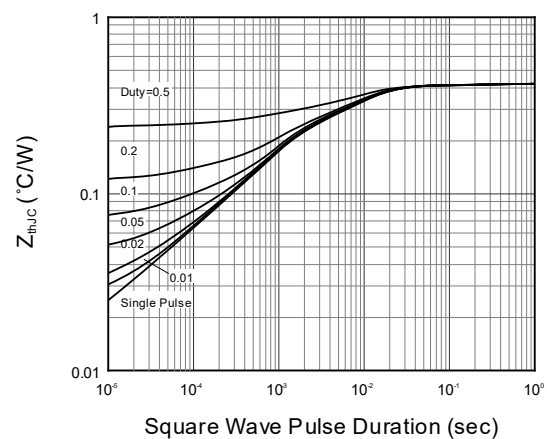
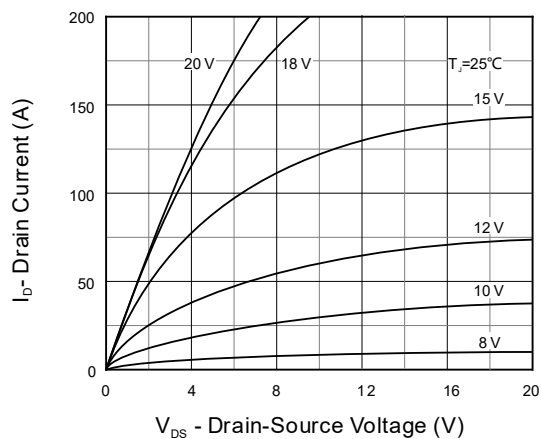
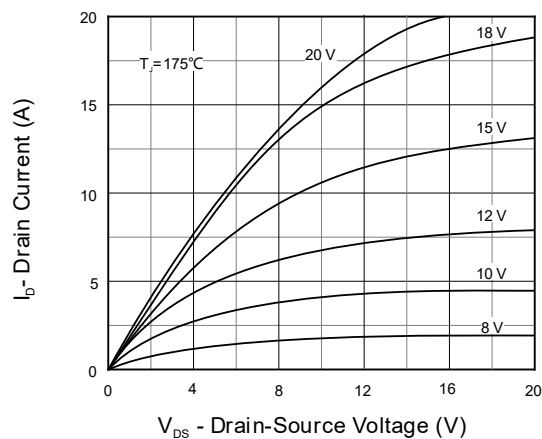


Fig 4. Transient Thermal Impedance



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



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

4. Typical Characteristics(cont.)

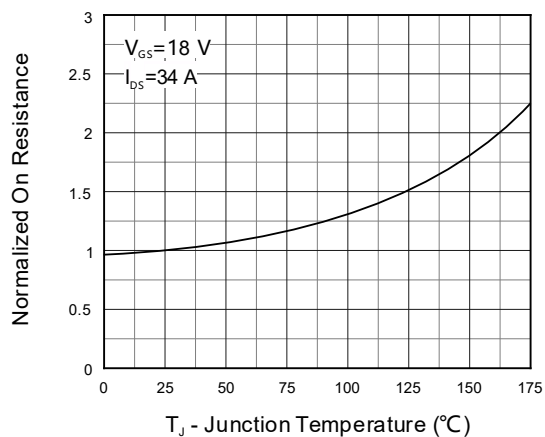


Fig 7. Normalized On Resistance

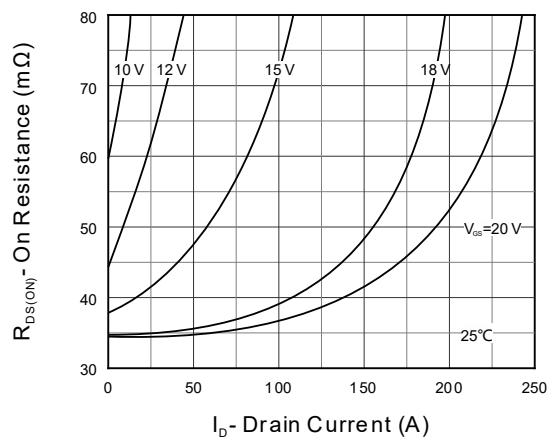


Fig 8. On Resistance vs. I_D

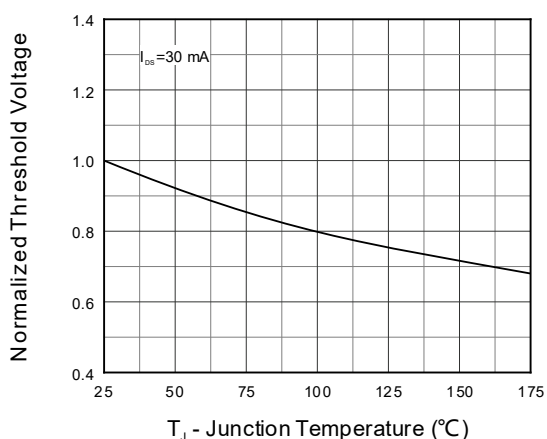


Fig 9. Normalized Threshold Voltage

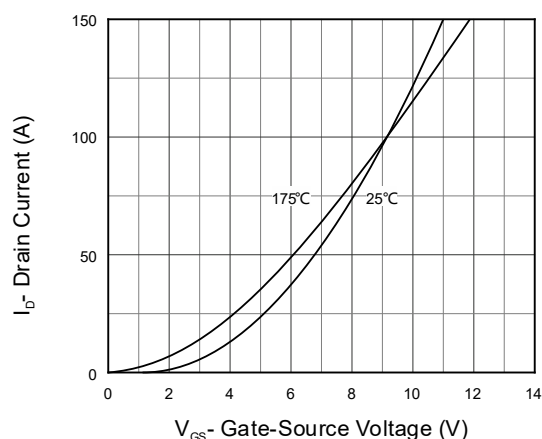


Fig 10. Diode Forward Current

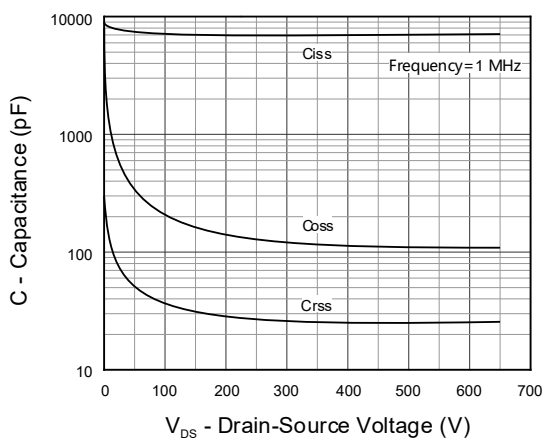


Fig 11. Capacitance

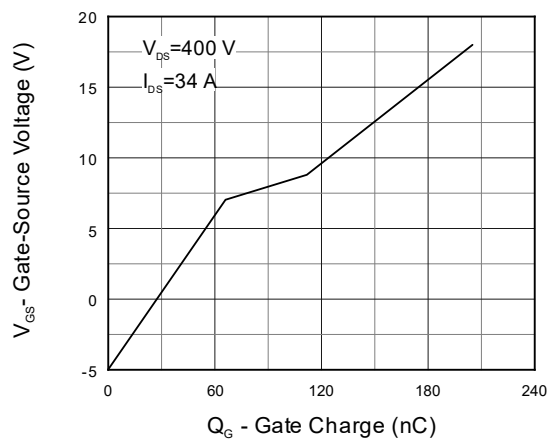
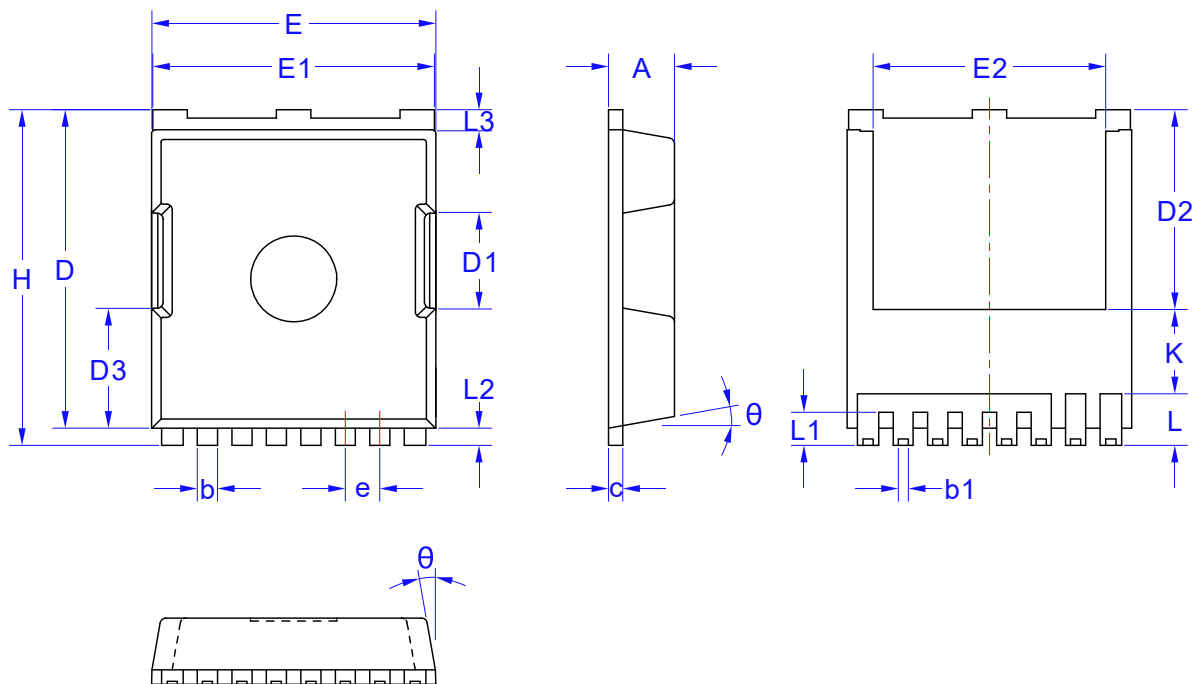


Fig 12. Gate Charge

5. Package Mechanical Data

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
b1	0.30		0.50
c	0.40	0.50	0.60
D	10.28	10.38	10.48
D1	3.20	3.30	3.40
D2	6.85	6.95	7.05
D3		4.18 REF	
E	9.80	9.90	10.0
E1	9.70	9.80	9.90

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
E2	8.00	8.10	8.20
e		1.20 BSC	
H	11.48	11.68	11.88
L	1.60	1.80	2.10
L1	1.00	1.15	1.30
L2		0.60 TYPE	
L3		0.60 TYPE	
K		2.90 TYPE	
θ	8°	10°	12°