

Silicon Carbide Power Mosfet

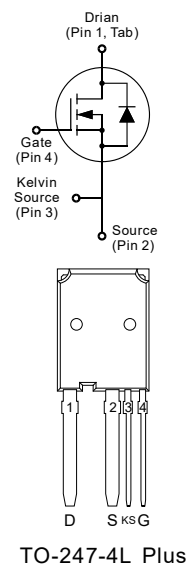
1. Product Information

Features

- 750V, 8mΩ, 288A, 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)
KJSC75R08P4	TO-247-4 Plus	KJSC75R08P4	Tube	

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	750	V
I_D	Continuous Drain Current, $T_C=25^\circ\text{C}$	288	A
	Continuous Drain Current, $T_C=100^\circ\text{C}$	203	A
I_{DM}	Peak Drain Current, Pulse width t_p limited by T_{jmax}	864	A
$V_{GS, max}$	Gate-Source Voltage (Maximum)	-10/+25	V
$V_{GS, OP}$	Gate-Source Voltage (Recommended Operating)	-4/+18	V
P_D	Power Dissipation	833	W
E_{AS}	Single Pulsed Avalanche Energy $V_{DS}=50\text{ V}$, $L=5\text{ mH}$, $R_G=25\ \Omega$	3200	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	43	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.18	$^\circ\text{C/W}$

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	750	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =750 V, V _{GS} =0 V	-	1	50	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0 V, V _{GS} =-4 to 18 V,	-	-	±250	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =30 mA	2	2.8	3.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =18 V, I _D =120 A	-	5	8	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =600 V, V _{GS} =0 V, f=1 MHz	-	16810	-	pF
C _{oss}	Output Capacitance		-	955	-	pF
C _{rss}	Reverse Transfer Capacitance		-	75	-	pF
E _{oss}	Coss Stored Energy		-	165	-	μJ
R _G	Gate Resistance	f=1 MHz	-	1	-	Ω
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =400 V, I _D =120 A, V _{GS} =-4/+18 V	-	590	-	nC
Q _{gs}	Gate-Source Charge		-	285	-	nC
Q _{gd}	Gate-Drain Charge		-	145	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =400 V, I _D =120 A, V _{GS} =-4/+18 V, R _G =2.5 Ω, L=200 μH	-	28	-	ns
t _r	Turn-on Rise Time		-	46	-	ns
t _{d(off)}	Turn-off Delay Time		-	59	-	ns
t _f	Turn-off Fall Time		-	25	-	ns
E _{ON}	Turn-on Energy		-	785	-	mJ
E _{OFF}	Turn-off Fall Time Energy		-	1640	-	mJ
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =-5 V, I _S =120 A	-	4.2	-	V
T _{rr}	Reverse Recovery Time	V _R =400 V, I _F =120 A, di _F /dt=1000 A/μs	-	98	-	ns
I _{rrm}	Peak Reverse Recovery Current		-	35	-	A
Q _{rr}	Reverse Recovery Charge		-	588	-	nC

4. Typical Characteristics

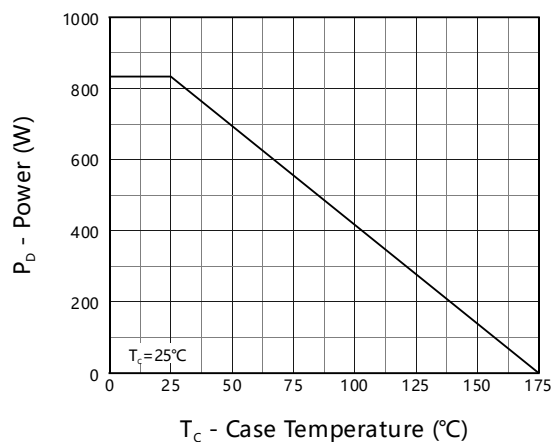


Fig 1. Power Capability

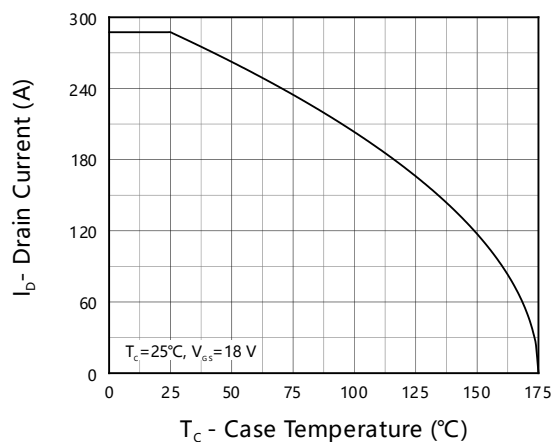


Fig 2. Current Capability

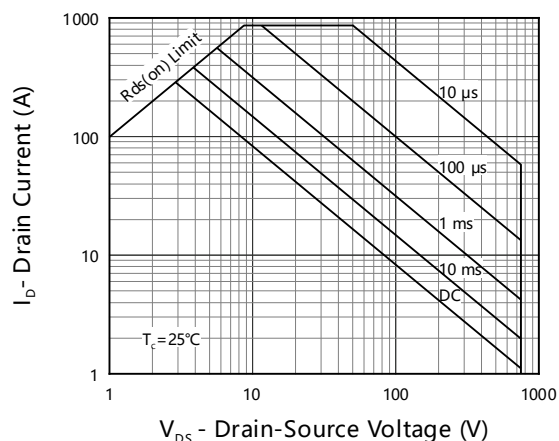


Fig 3. Safe Operation Area

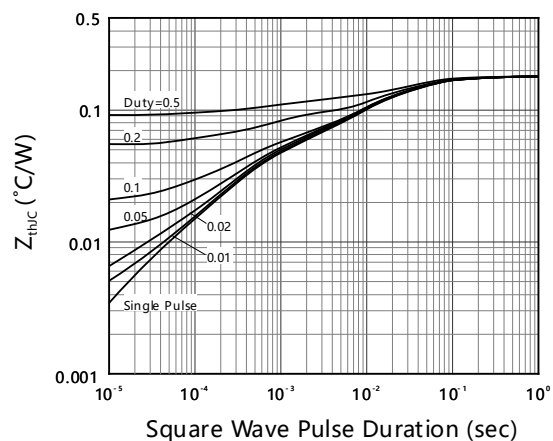


Fig 4. Transient Thermal Impedance

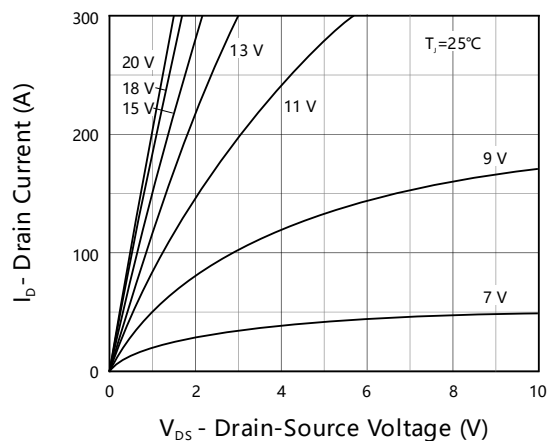


Fig 5. Output Characteristics, $T_J = 25^{\circ}\text{C}$

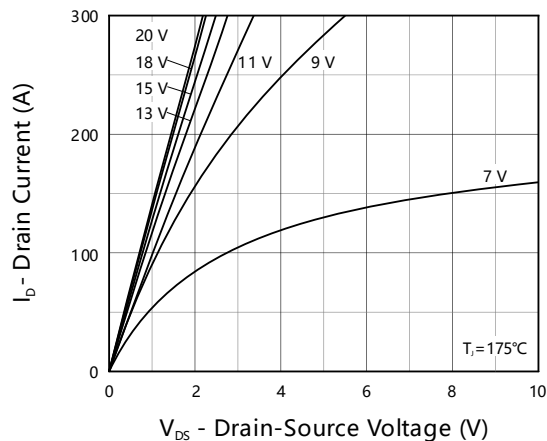


Fig 6. Output Characteristics, $T_J = 175^{\circ}\text{C}$

4. Typical Characteristics(cont.)

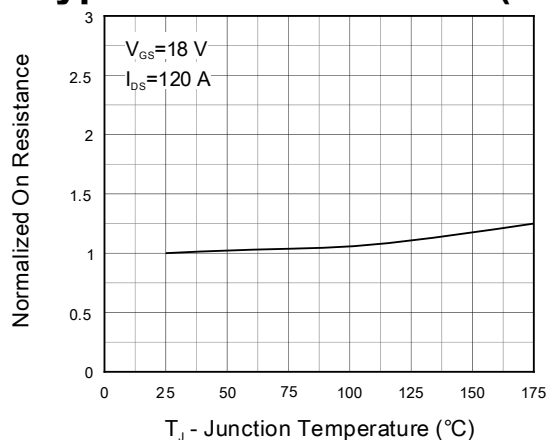


Fig 7. Normalized On Resistance

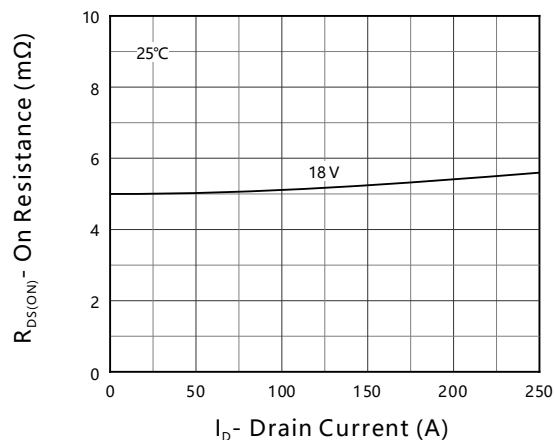


Fig 8. On Resistance vs. I_D

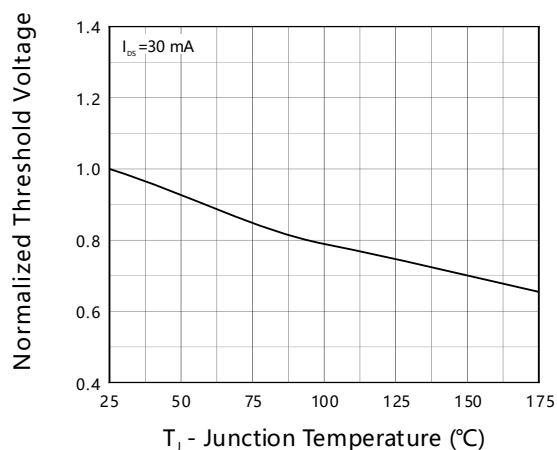


Fig 9. Normalized Threshold Voltage

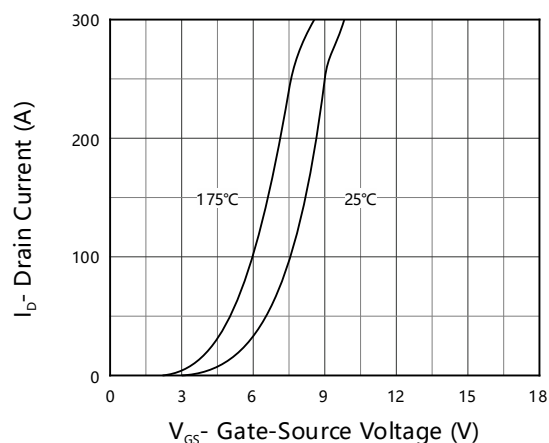


Fig 10. Diode Forward Current

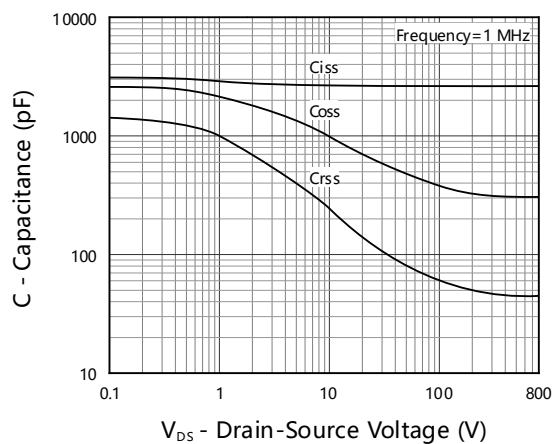


Fig 11. Capacitance

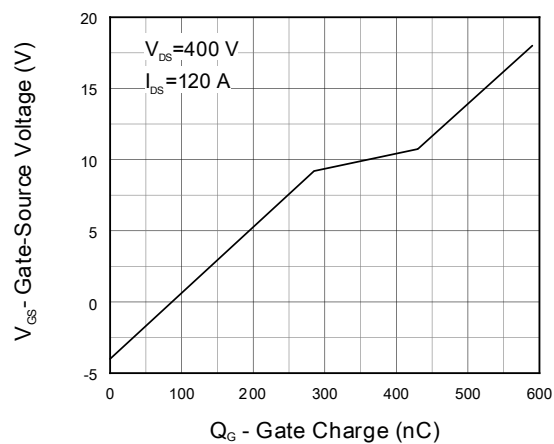
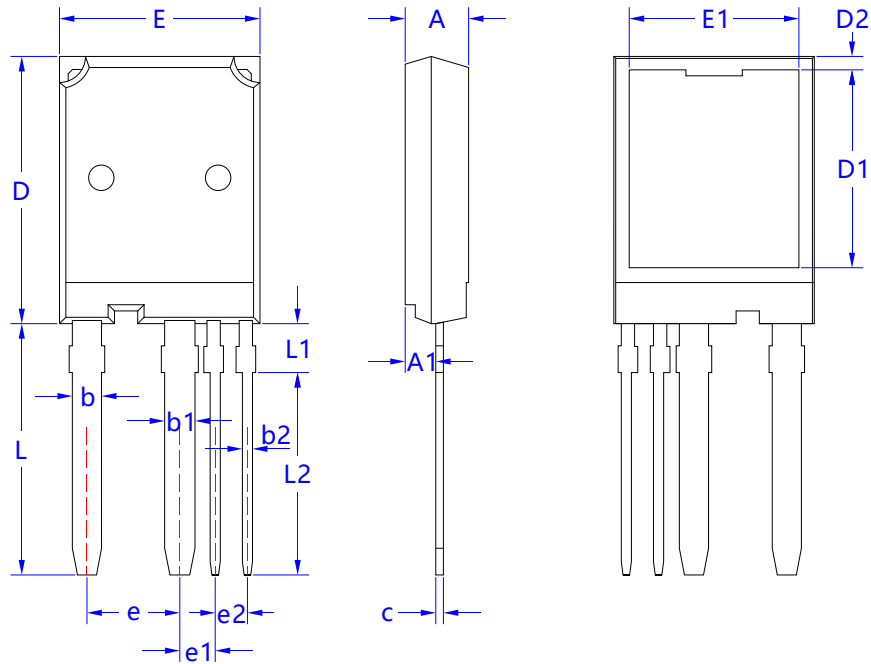


Fig 12. Gate Charge

5. Package Mechanical Data

TO-247-4L Plus Package



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	4.8	5.0	5.2
A1	2.21	2.41	2.61
b	2.05	2.20	2.35
b1	2.15	2.30	2.45
b2	0.65	0.8	0.95
c	0.5	0.6	0.7
D	20.7	21.0	21.3
D1	15.35	15.55	15.75
D2	1.00	1.20	1.40
E	15.5	15.8	16.1
E1	4.13	4.33	4.53
e	7.12	7.32	7.52
e1	2.59	2.79	2.99
e2	2.34	2.54	2.74
L	19.7	20	20.3
L1	4.1	4.2	4.3
L2	15.5	15.8	16.1