

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Self-aligned Planar Technology
- Excellent Excellent $R_{DS(ON)}$ and Switching Performance

Pin Description

Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

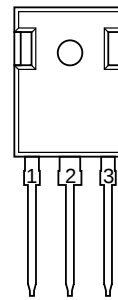
Applications

- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

Quick reference

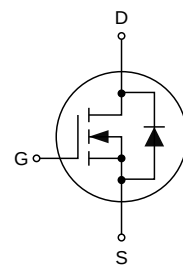
- $V_{DS} = 200\text{ V}$
- $I_D = 130\text{ A}$
- $R_{DS(ON)} \leq 23\text{ m}\Omega @ V_{GS} = 10\text{ V}$ (Type:18 m Ω)

Simplified Outline



Top View
TO-247

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel size	Tape width	Quantity (pcs)
KJ130N20P	TO247-3L	KJ130N20P YWWXXX	N/A	N/A	500

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current, $T_A=25^\circ\text{C}$ ¹	130	A
I_{DM}	Pulsed Drain Current ²	390	A
E_{AS}	Single Pulse Avalanche Energy ³	225	mJ
I_{AR}	Single Pulse Avalanche Current	30	A
P_D	Power Dissipation ⁴	278	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	°C
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	48	°C/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.45	°C/W

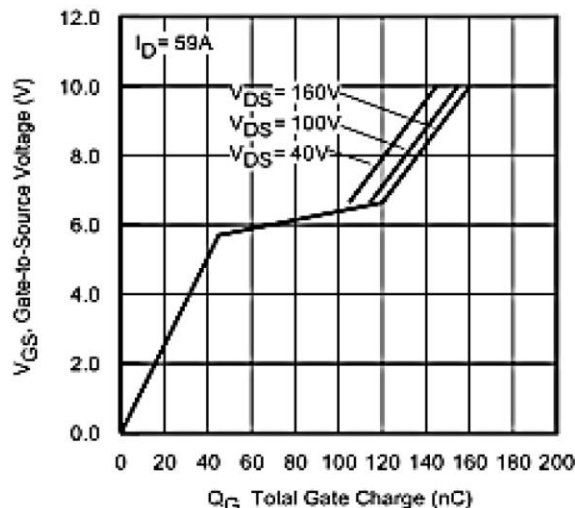
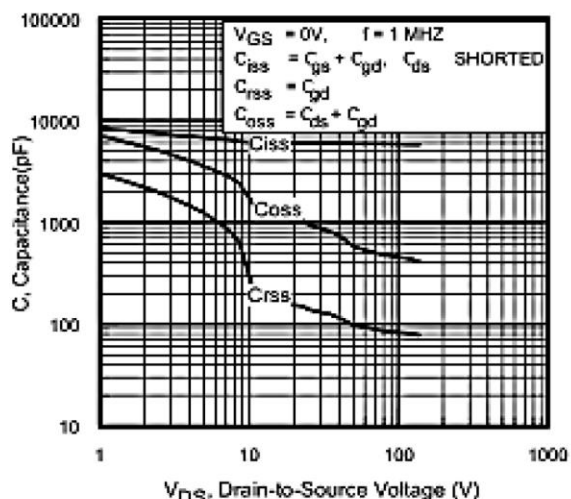
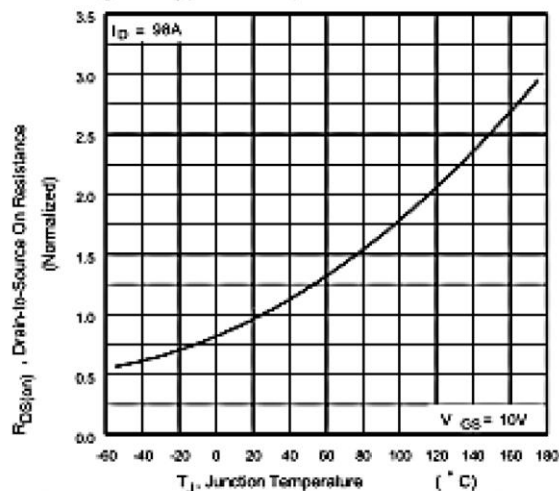
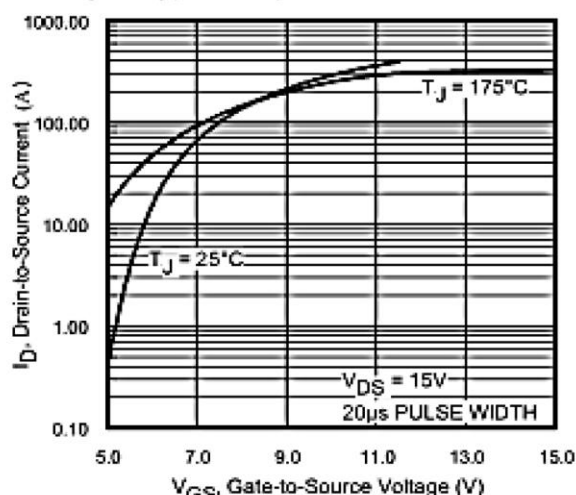
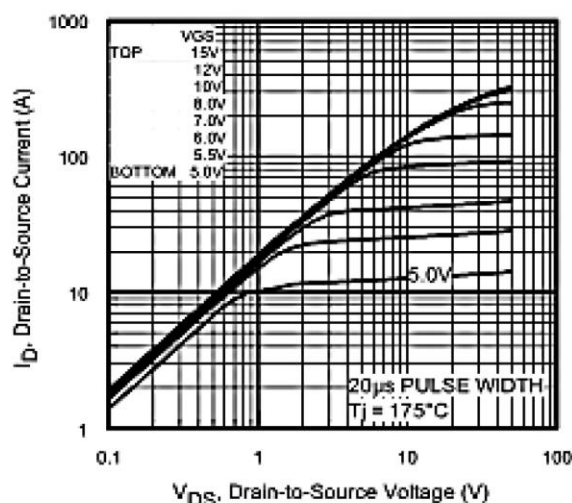
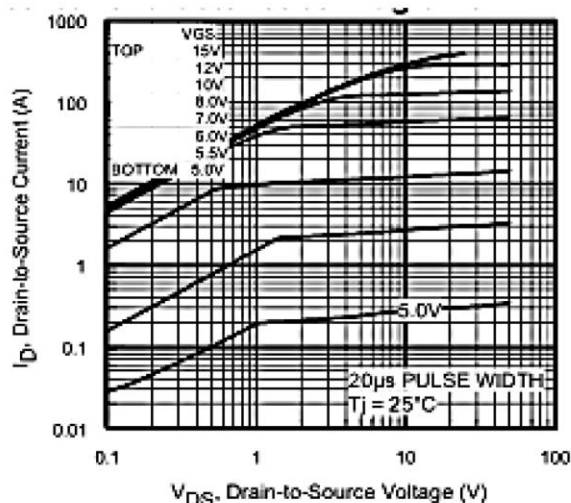
3. Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	200	-	-	V
V _{GS(th)}	Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	2.0	3.0	4.0	V
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =200 V, V _{GS} =0 V	-	-	5	μA
R _{DS(on)}	Drain-Source On-Resistance ¹	V _{GS} =10 V, I _D =9 A	-	18	23	mΩ
C _{iss}	Input Capacitance	V _{DS} =25 V, V _{GS} =0 V, f=1.0 MHz	-	6560	-	pF
C _{oss}	Output Capacitance		-	980	-	
C _{rss}	Reverse Transfer Capacitance		-	62	-	
Q _g	Total Gate Charge	V _{DS} =160 V, V _{GS} =10 V, I _D =90 A	-	202	-	nC
Q _{gs}	Gate-Source Charge		-	27	-	
Q _{gd}	Gate-Drain Charge		-	62	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =100 V, V _{GS} =10 V, I _D =90 A, R _G =20 Ω	-	45	-	ns
t _r	Turn-on Rise Time		-	72	-	
t _{d(off)}	Turn-off Delay Time		-	109	-	
t _f	Turn-off Fall Time		-	91	-	
V _{SD}	Diode Forward Voltage	V _{GS} =0 V, I _S =9 A	-	-	1.4	V
I _S	Diode Forward Current		-	-	130	A
I _{SM}	Diode Pulse Current		-	-	390	A
t _{rr}	Reverse Recovery Time	V _{GS} =0 V, I _S =90 A, dI/dt=100 A/μs	-	276	-	ns
Q _{rr}	Reverse Recovery Charge		-	2.4	-	μC

Notes:

1. Mounted on a 1 in² FR-4 board with 2 OZ copper.
2. Pulse width ≤ 300 μs, duty cycle ≤ 2%.
3. Test condition is V_{DD}=50 V, L=0.3 mH, R_G=25 Ω, Starting T_J=25°C.
4. Limited by 150°C junction temperature.

4. Typical Characteristics



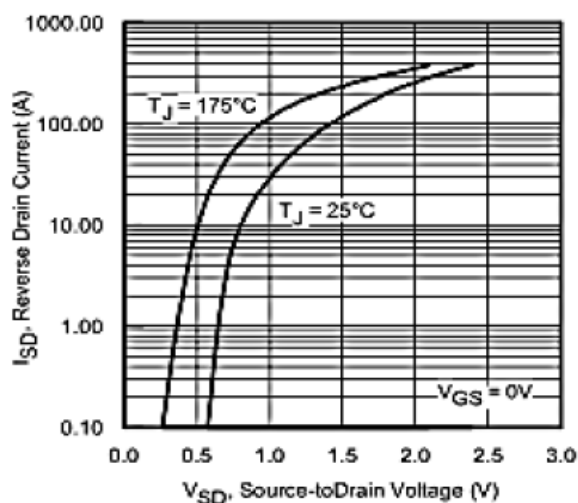


Fig 7. Typical Source-Drain Diode Forward Voltage

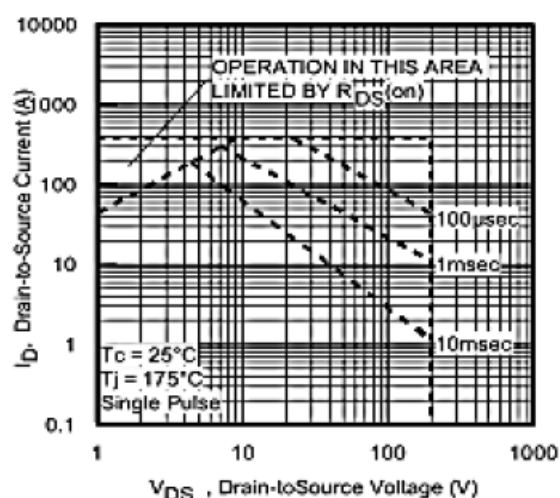


Fig 8. Maximum Safe Operating Area

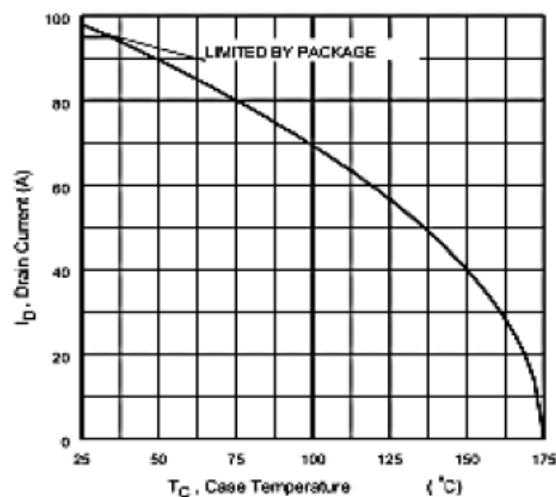


Fig 9. Maximum Drain Current Vs. Case Temperature

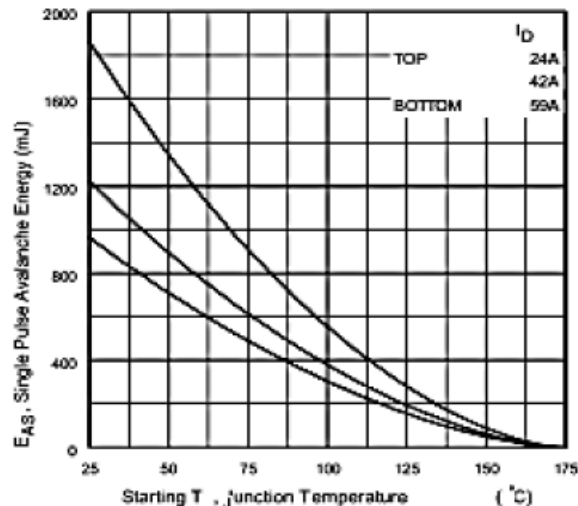


Fig 10. Maximum Avalanche Energy Vs. Drain Current

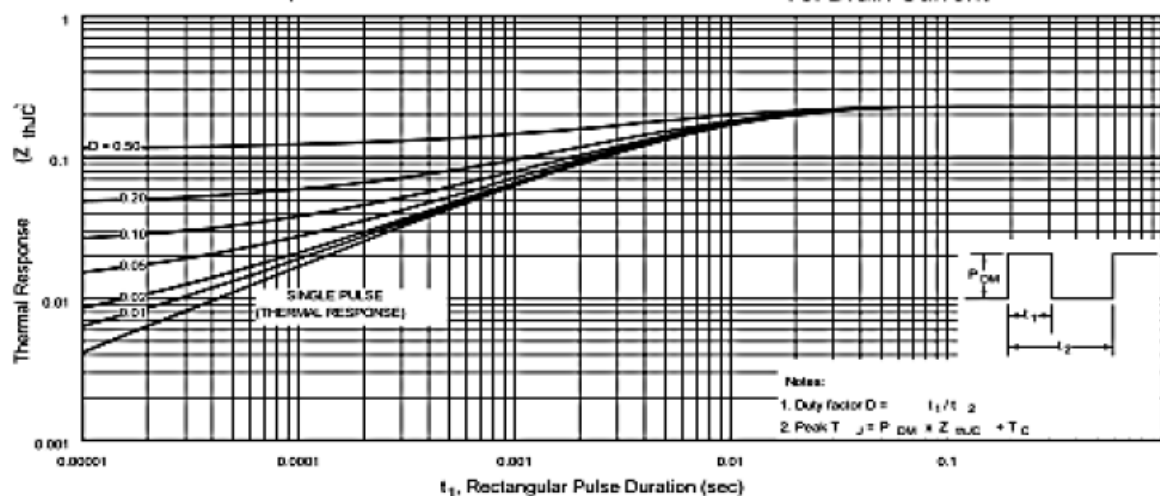
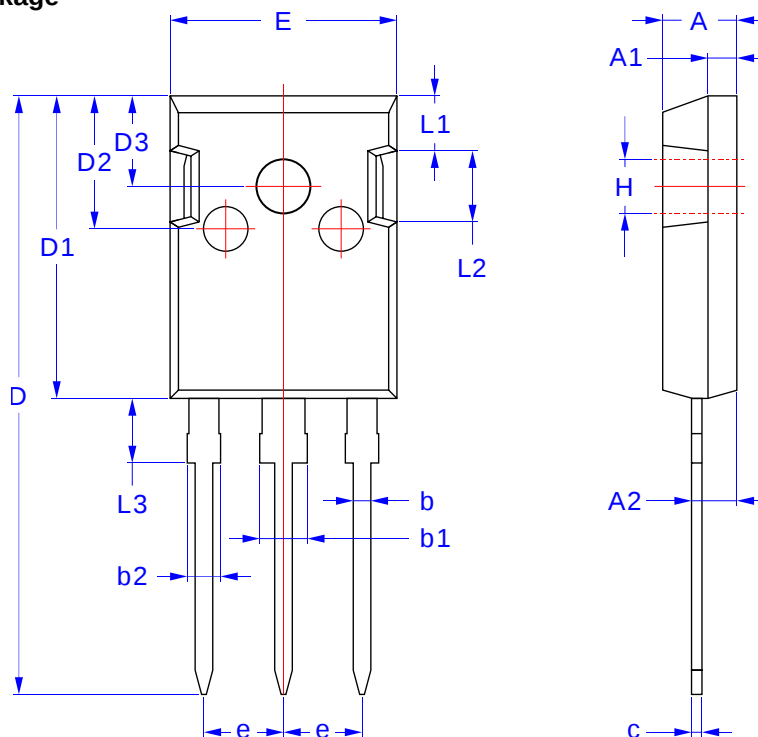


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

5. Package Mechanical Data

TO247-3L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	4.90	5.10
A1	1.90	2.10
A2	2.00	3.00
b	1.20	1.30
b1	2.50	3.50
b2	1.75	2.50
c	0.55	0.75
D	41.00	42.00
D1	20.00	21.00
D2	8.00	10.00
D3	5.00	6.00
E	15.00	16.00
e	TYP 5.08	
H	3.00	3.50
L1	3.50	4.00
L2	4.75	5.25
L3	4.00	5.00