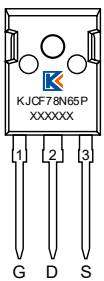
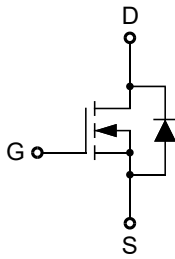


Product Information

V_{DS}	I_D	$R_{DS(ON), max}$	Pin Assignment and Marking  TO-247-3L 1 st Line: LOGO 2 nd Line: Part number 3 rd Line: LOT code  G: Gate D: Drain S: Source 100% Avalanche Tested   
650 V	43 A	78 mΩ @$V_{GS}=10\text{ V}$	
Features ♦ Through-hole package ♦ Super Junction technology ♦ Much lower FOM for fast switching efficiency Applications ♦ Charger ♦ Solar Inverter System ♦ LED/LCD/PDP TV and monitor Lighting			

Package and Ordering Information

Part number	Package	Packaging	Quantity (pcs)	Reel size	Tape width
KJCF78N65P	TO-247-3L	☐ Tape & Reel	N/A	N/A	N/A
		☒ Tube	30	N/A	N/A

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

Parameter	Symbol	Conditions	Values	Unit
Drain-Source Voltage	V_{DS}	$T_C=25^\circ\text{C}$	650	V
Gate-Source Voltage	V_{GS}	$T_C=25^\circ\text{C}$	± 30	V
Drain Current (DC)	I_D	$T_C=25^\circ\text{C}, V_{GS}=10\text{ V}$	43	A
		$T_C=100^\circ\text{C}, V_{GS}=10\text{ V}$	27.3	A
Drain Current (Pulsed)	I_{DM}	$T_C=25^\circ\text{C}, V_{GS}=10\text{ V}$	172	A
Total Power Dissipation	P_{tot}	$T_C=25^\circ\text{C}$	47	W
Single Pulsed Avalanche Energy	E_{AS}	$L=60\text{ mH}, R_g=30\ \Omega$	3434	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}		-55–150	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient	R_{thJA}		45	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	R_{thJC}		2.65	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}$, $I_{DS}=250\text{ }\mu\text{A}$	650	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\text{ }\mu\text{A}$	3	-	4	V
Zero Gate Voltage Source Current	I_{DSS}	$V_{GS}=0\text{ V}$, $V_{DS}=650\text{ V}$, $T_C=25^{\circ}\text{C}$	-	-	1	μA
		$V_{GS}=0\text{ V}$, $V_{DS}=650\text{ V}$, $T_C=100^{\circ}\text{C}$	-	50	-	μA
Gate Leakage Current	I_{GSS}	$V_{DS}=0\text{ V}$, $V_{GS}=\pm 30\text{ V}$	-	-	± 100	nA
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{ V}$, $I_D=21.5\text{ A}$, $T_C=25^{\circ}\text{C}$	-	66	78	m Ω
		$V_{GS}=10\text{ V}$, $I_D=21.5\text{ A}$, $T_C=100^{\circ}\text{C}$	-	175	-	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$, Frequency=1 MHz	-	4200	-	pF
Output Capacitance	C_{oss}		-	135	-	
Reverse Transfer Capacitance	C_{rss}		-	1.9	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=400\text{ V}$, $V_{GS}=10\text{ V}$, $R_G=27\text{ }\Omega$, $I_D=21.5\text{ A}$	-	76	-	ns
Turn-on Rise Time	t_r		-	70	-	
Turn-off Delay Time	$t_{d(off)}$		-	365	-	
Turn-off Fall Time	t_f		-	68	-	
Total Gate Charge	Q_g	$V_{DS}=480\text{ V}$, $V_{GS}=10\text{ V}$, $I_{DS}=21.5\text{ A}$	-	112	-	nC
Gate-Source Charge	Q_{gs}		-	28	-	
Gate-Drain Charge	Q_{gd}		-	44	-	
Gate resistance	R_G	f=1 MHz				
Body Diode Characteristics						
Diode Forward Voltage ^[2]	V_{SD}	$V_{GS}=0\text{ V}$, $I_{SD}=21.5\text{ A}$	-	0.85	1.1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0\text{ V}$, $I_{DS}=21.5\text{ A}$, $di_{SD}/dt=100\text{ A}/\mu\text{s}$	-	488	-	ns
Reverse Recovery Charge	Q_{rr}		-	8.8	-	μC

Typical Characteristics

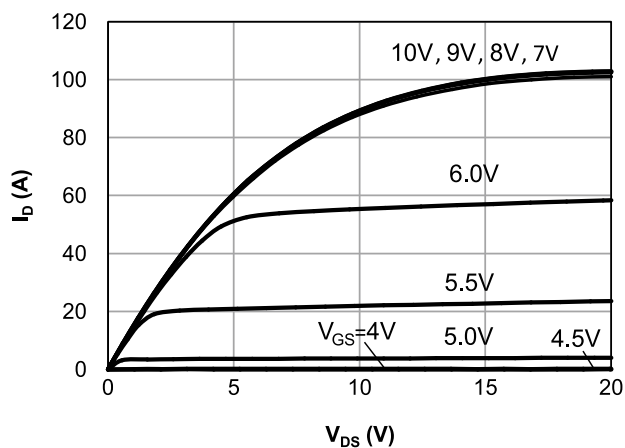


Figure 1. Output Characteristics ($T_j=25^{\circ}\text{C}$)

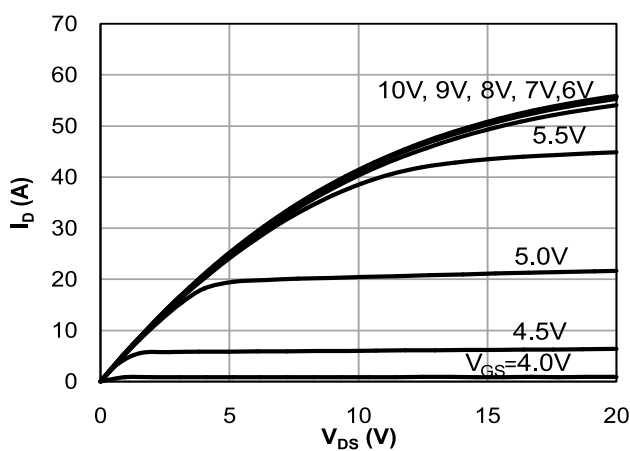


Figure 2. Output Characteristics ($T_j=150^{\circ}\text{C}$)

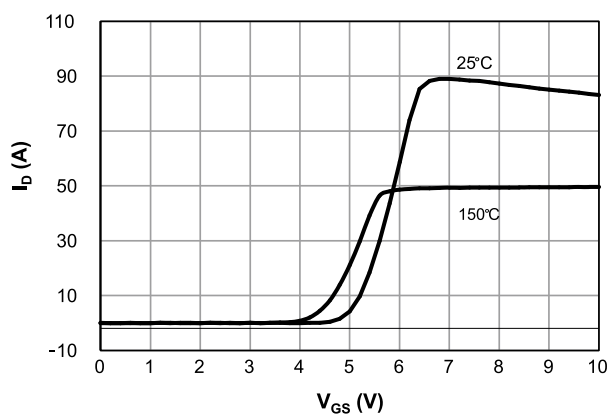


Figure 3. Transfer Characteristics

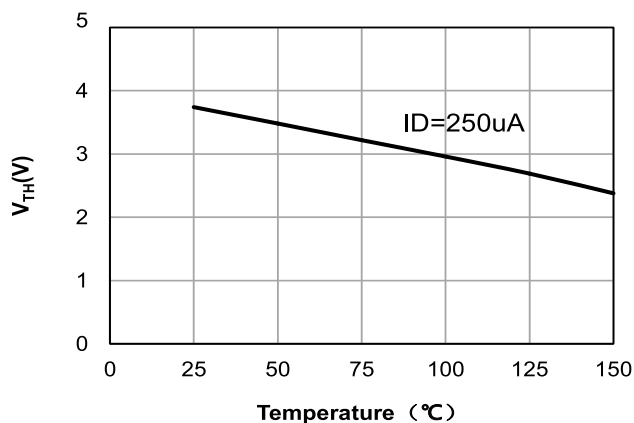


Figure 4. V_{th} Vs T_j Temperature Characteristics

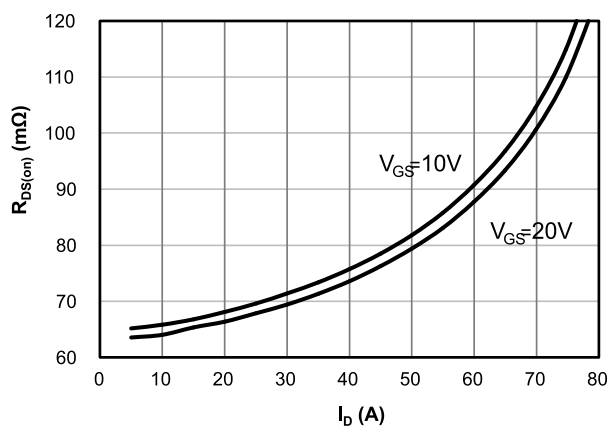


Figure 5. $R_{DS(on)}$ vs I_D Characteristics ($T_c=25^{\circ}\text{C}$)

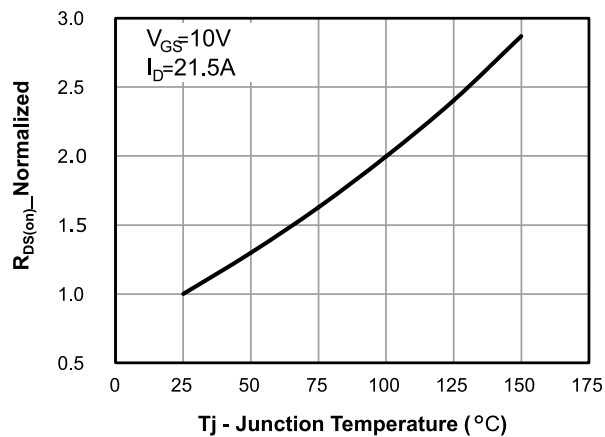


Figure 6. $R_{DS(on)}$ vs Temperature

Typical Characteristics (cont.)

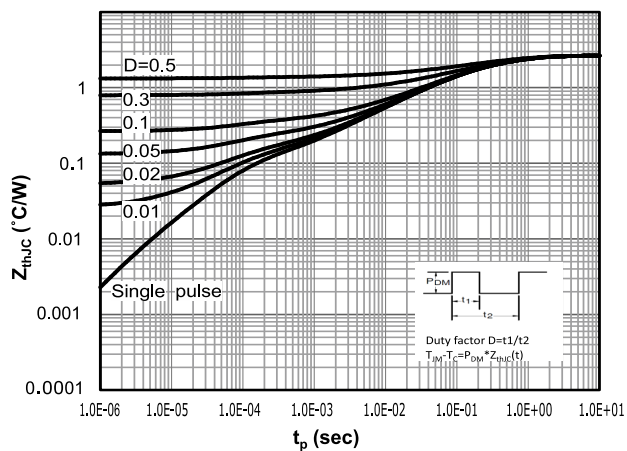


Figure 7. Max. Transient Thermal Impedance

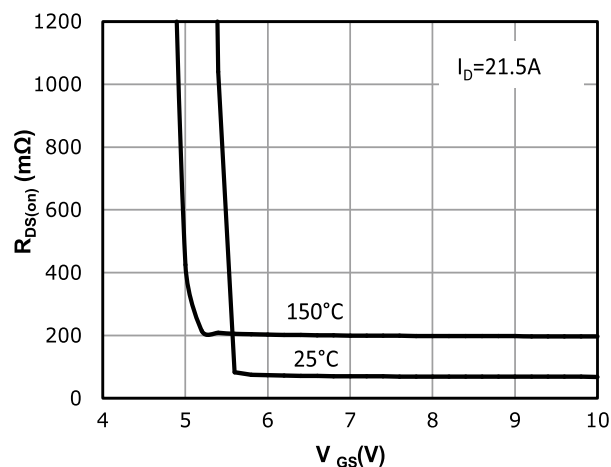


Figure 8. $R_{DS(on)}$ vs Gate Voltage

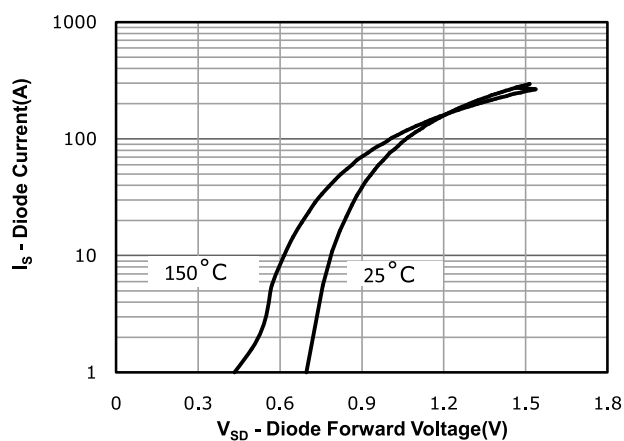


Figure 9. Body-diode Forward Characteristics

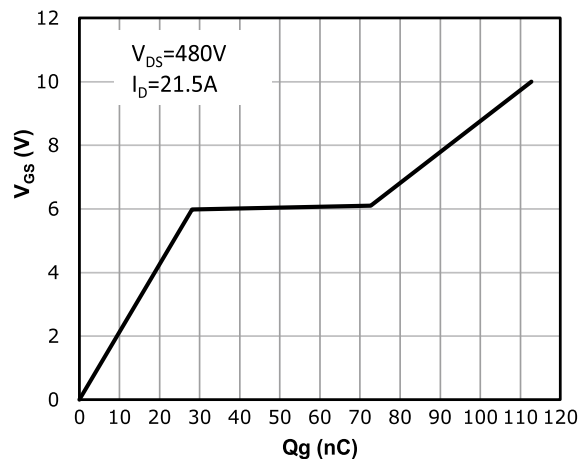


Figure 10. Gate Charge Characteristics

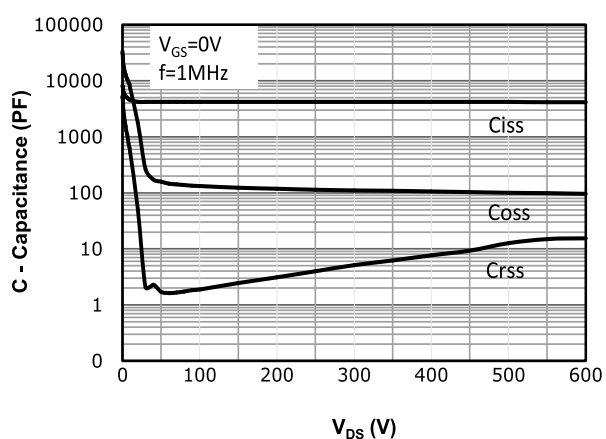


Figure 11. Capacitance

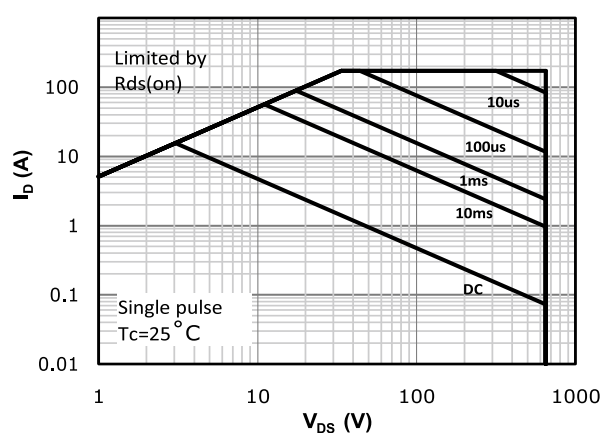
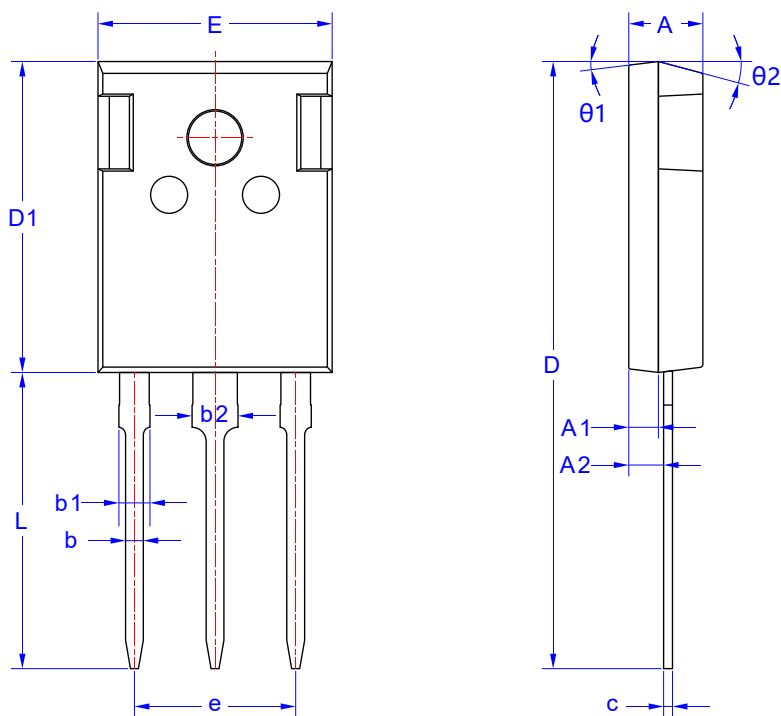


Figure 12. Safe Operating Area

Package Dimensions

TO-247-3L



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	1.90	2.00	2.10
A2	2.25	2.35	2.45
b		1.20	
b1		2.10	
b2		3.10	
c		0.60	
D	40.00	41.00	42.00
D1	20.80	21.00	21.20
E	15.60	15.80	16.00
e		10.88	
L	19.80	20.00	20.20
θ1		7°	
θ2		15°	