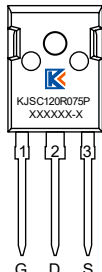
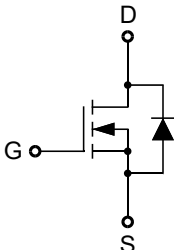


Product Information

V_{DS}	I_D	$R_{DS(ON), max}$
1200 V	38 A	75 mΩ @ $V_{GS}=18 V$
Features ♦ Through-hole package ♦ Advanced semiconductor materials Silicon Carbide ♦ High blocking voltage with low on-resistance ♦ High-speed switching with very low switching losses ♦ High-speed and high robust intrinsic body diode		
Applications ♦ EV Charger ♦ Solar Inverter System ♦ Energy storage system		

Pin Assignment and Marking	
 TO-247-3L 1st Line: LOGO 2nd Line: Part number 3rd Line: LOT code	 G: Gate D: Drain S: Source
100% Avalanche Tested 	

**100%
Avalanche Tested**



Package and Ordering Information

Part number	Package	Packaging	Quantity (pcs)	Reel size	Tape width
KJSC120R075P	TO-247-3L	Tube	30	N/A	N/A

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

Parameter	Symbol	Conditions	Values	Unit
Drain-Source Voltage	V_{DS}	$T_C=25^{\circ}C$	1200	V
Gate-Source Max Voltage	$V_{GS, max}$	$T_C=25^{\circ}C$	-10/22	V
Gate-Source Operate Voltage	$V_{GS, op}$	$T_C=25^{\circ}C$	-5/18	V
Drain Current (DC)	I_D	$T_C=25^{\circ}C, V_{GS}=18 V$	38	A
		$T_C=100^{\circ}C, V_{GS}=18 V$	27	A
Drain Current (Pulsed)	I_{DM}	$T_C=25^{\circ}C, V_{GS}=18 V$	76	A
Power Dissipation	P_D	$T_C=25^{\circ}C$	195	W
Single Pulsed Avalanche Energy	E_{AS}	$L=0.3 mH, V_{DS}=50 V$	80	mJ

Package Values

Parameter	Symbol	MIN	Typ	MAX	Unit
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55		175	$^{\circ}C$
Thermal Resistance, Junction to Ambient	R_{thJA}			52	$^{\circ}C/W$
Thermal Resistance, Junction to Case	R_{thJC}		0.77	0.95	$^{\circ}C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}$, $I_{DS}=100\text{ }\mu\text{A}$	1200			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=4500\text{ }\mu\text{A}$		3		V
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0\text{ V}$, $V_{DS}=1200\text{ V}$, $T_C=25^\circ\text{C}$		0.1	20	μA
		$V_{GS}=0\text{ V}$, $V_{DS}=1200\text{ V}$, $T_C=175^\circ\text{C}$		1		μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{ V}$, $V_{GS}=-10/+22\text{ V}$			± 250	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=18\text{ V}$, $I_D=15\text{ A}$, $T_C=25^\circ\text{C}$		60	75	m Ω
		$V_{GS}=18\text{ V}$, $I_D=15\text{ A}$, $T_C=175^\circ\text{C}$		108		m Ω
Transconductance	g_{fs}	$V_{DS}=10\text{ V}$, $I_D=15\text{ A}$		9		S
Internal Gate Resistance	$R_{G(int)}$	Frequency=1 MHz, $V_{AC}=25\text{ mV}$		5.3		Ω
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		
Total Gate Charge	Q_g	$V_{DS}=800\text{ V}$, $V_{GS}=-5/+18\text{ V}$, $I_{DS}=15\text{ A}$		55		nC
Gate to Source Charge	Q_{gs}			18		
Gate to Drain Charge	Q_{gd}			12		

Dynamic MOSFET Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=800\text{ V}$, $V_{GS}=-5/+18\text{ V}$, $R_G=2.2\text{ }\Omega$, $I_D=15\text{ A}$, $L=200\text{ }\mu\text{H}$		7.5		ns
Turn-on Rise Time	t_r			9		
Turn-off Delay Time	$t_{d(off)}$			18		
Turn-off Fall Time	t_f			10		
Turn-On Switching Loss	$E_{(on)}$			172		μJ
Turn-Off Switching Loss	$E_{(off)}$			2.5		
Total Switching Energy	$E_{(tot)}$			174.5		

Maximum Ratings For Body Diode ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DSS}		1200	V
Continuous DC Source Current	I_{S}	$T_C=25^{\circ}\text{C}$	30	A
Peak Reverse Drain Current	I_{SM}	$T_C=25^{\circ}\text{C}$	76	A

Body Diode Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=-5\text{ V}$, $I_{\text{SD}}=7.5\text{ A}$		4.3		V
Peak Reverse Recovery Current	I_{rrm}	$V_{\text{DS}}=800\text{ V}$, $V_{\text{GS}}=-5\text{ V}$, $I_{\text{SD}}=15\text{ A}$, $di/dt=2000\text{ A}/\mu\text{s}$		15		A
Reverse Recovery Time	t_{rr}			200		ns
Reverse Recovery Charge	Q_{rr}			200		nC
Reverse Recovery Energy	E_{rr}			44		μJ

Typical Characteristics

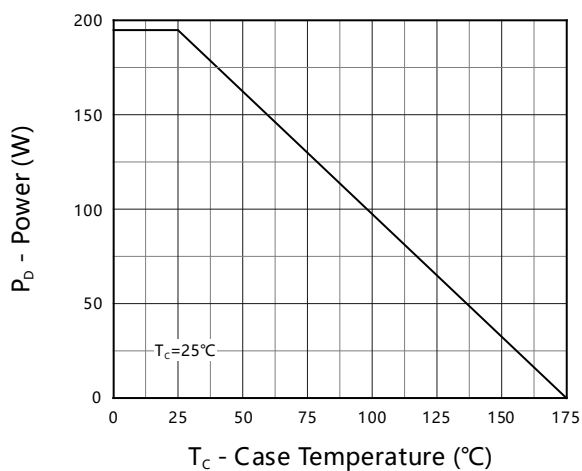


Fig 1. Power Capability

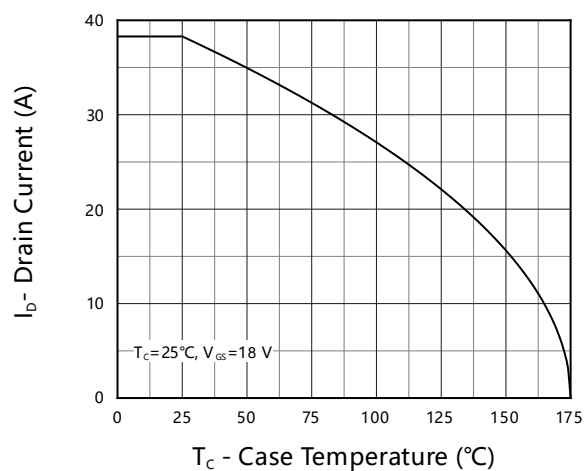


Fig 2. Current Capability

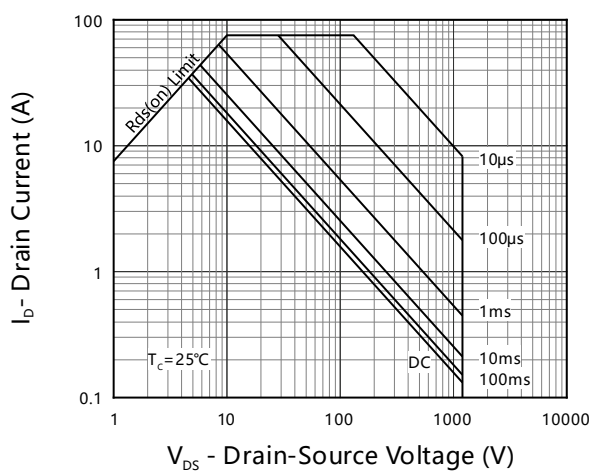


Fig 3. Safe Operation Area

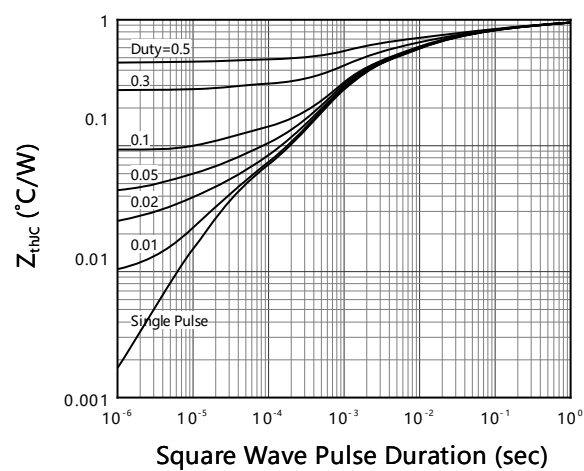


Fig 4. Transient Thermal Impedance

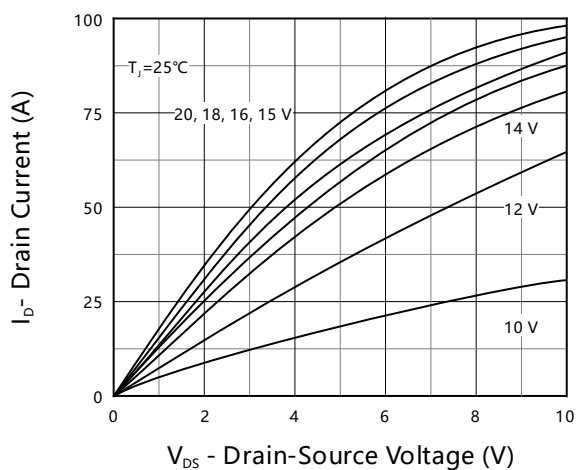


Fig 5. Output Characteristics, $T_J = 25^{\circ}\text{C}$

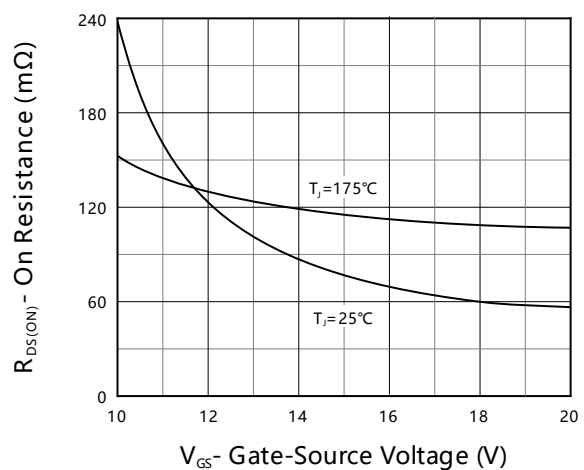


Fig 6. On-state resistance

Typical Characteristics (cont.)

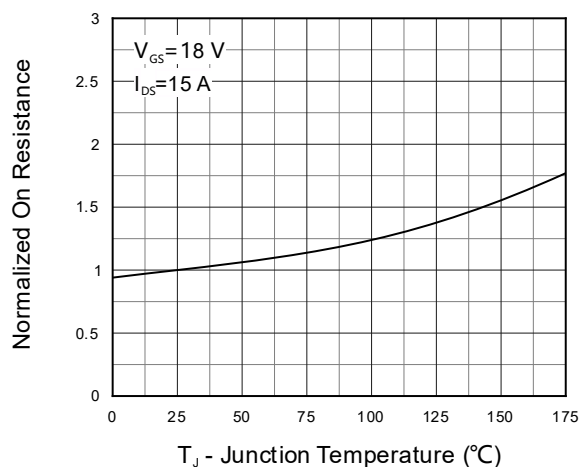


Fig 7. Normalized On Resistance

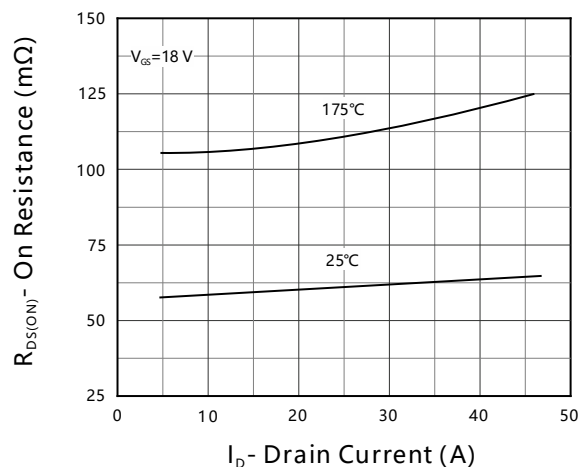


Fig 8. On Resistance vs. I_D

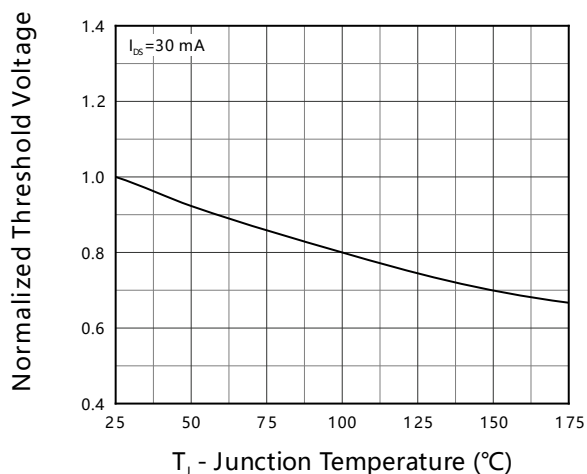


Fig 9. Normalized Threshold Voltage

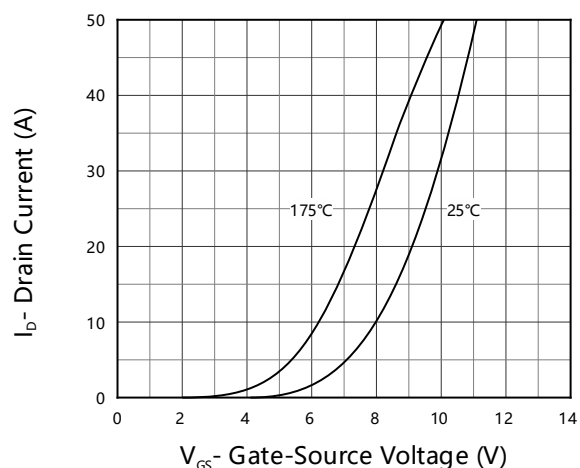


Fig 10. Diode Forward Current

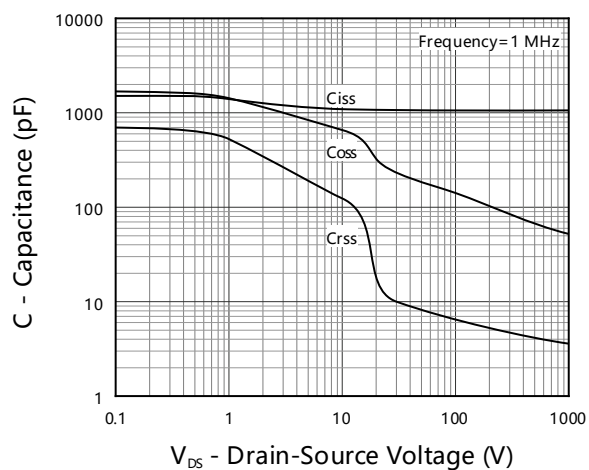


Fig 11. Capacitance

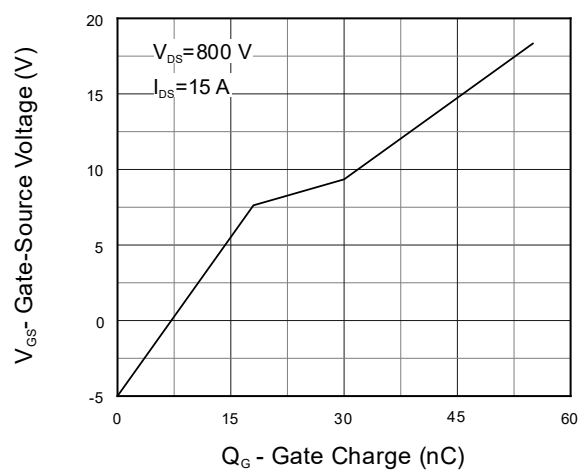


Fig 12. Gate Charge

Typical Characteristics (cont.)

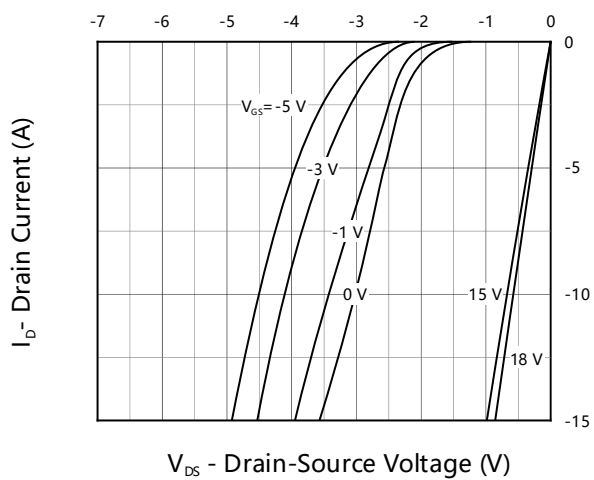


Fig 13. Body Diode Characteristics
 $T_j = 25^\circ\text{C}$

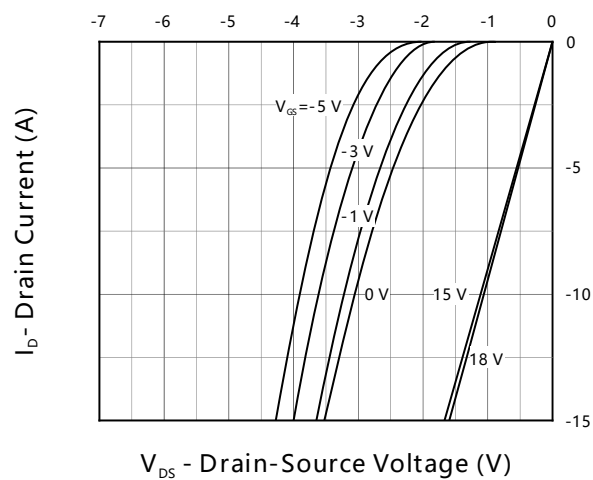
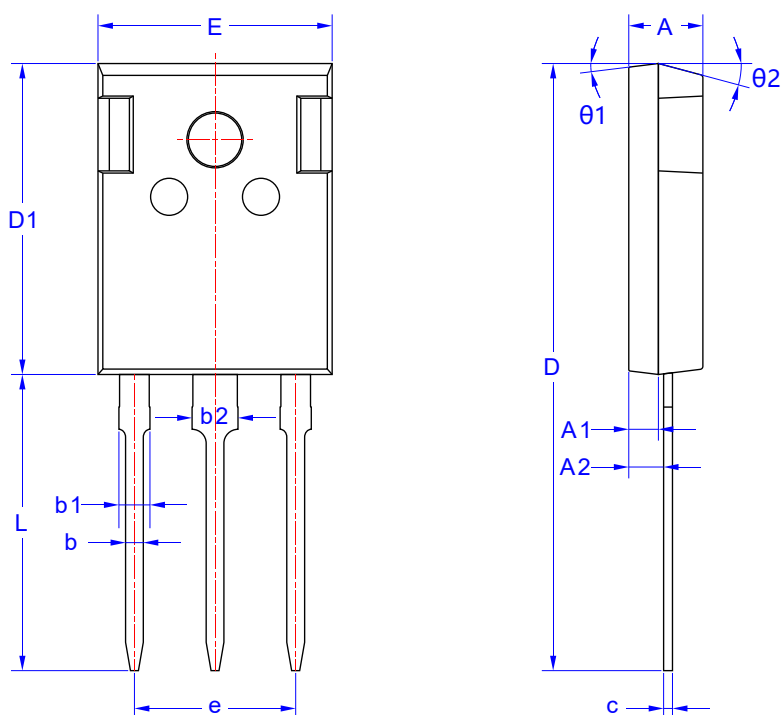


Fig 14. Body Diode Characteristics
 $T_j = 175^\circ\text{C}$

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°	