

Super-Junction Power Mosfet

1. Product Information

Features

- Super Junction technology
- Low FOM $R_{DS(ON)} \times Q_G$
- Lead free product is acquired

Applications

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

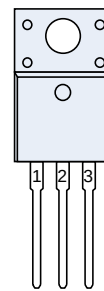
Quick reference

- $V_{DS} \geq 650\text{ V}$
- $I_D \leq 13\text{ A}$
- $R_{DS(ON)} \leq 300\text{ m}\Omega$ @ $V_{GS}=10\text{ V}$ (Type 270 m Ω)

Pin Description

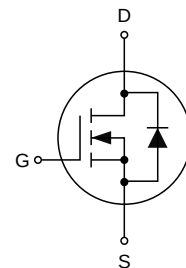
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-220F

Symbol



Package Marking and Ordering Information

Part number	Marking	Package	Packaging	Quantity	Reel size	Tape width
KJC65R290CF	KJC65R290CF	TO-220F	☐ Tape & Reel	N/A	N/A	N/A
			☒ Tube	1000 PCS	N/A	N/A

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current (T _C =25°C)	13	A
	Continuous Drain Current (T _C =100°C)	8.2	A
I_{DM}	Pulsed Drain Current	52	A
E_{AS}	Single Pulsed Avalanche Energy	118	mJ
I_{AR}	Avalanche Current	2.8	A
P_D	Power Dissipation	131	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient	140	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-Case	0.95	°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	-	-	1	μA
		V _{DS} =650 V, T _J =150°C	-	5	-	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30 V, V _{DS} =0 V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	3	-	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10 V, I _D =7 A	-	270	295	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100 V, V _{GS} =0 V, f=1 MHz	-	765	-	pF
C _{oss}	Output Capacitance		-	50	-	pF
C _{rss}	Reverse Transfer Capacitance		-	1.5	-	pF
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =400 V, I _D =7 A, R _G =25 Ω, V _{GS} =10 V	-	15	-	ns
t _r	Turn-on Rise Time		-	27	-	ns
t _{d(off)}	Turn-off Delay Time		-	95	-	ns
t _f	Turn-off Fall Time		-	23	-	ns
Q _g	Total Gate Charge	V _{DS} =480 V, I _D =7 A, V _{GS} =10 V	-	26	-	nC
Q _{gs}	Gate-Source Charge		-	6.5	-	nC
Q _{gd}	Gate-Drain Charge		-	10	-	nC
Source-Drain Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0 V, I _F =7 A	-	0.85	1.1	V
Q _{rr}	Reverse Recovery Time	V _{DS} =400 V, I _{SD} =7 A, di/dt=100 A/μs	-	2.8	-	μC
T _{rr}	Reverse Recovery Charge		-	246	-	ns

4. Electrical Characteristics

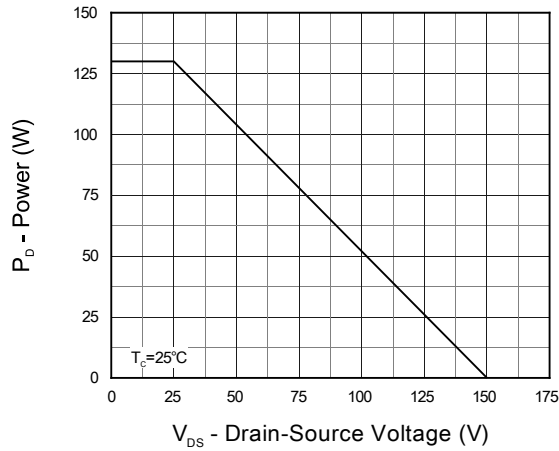


Fig 1. Power Characteristics

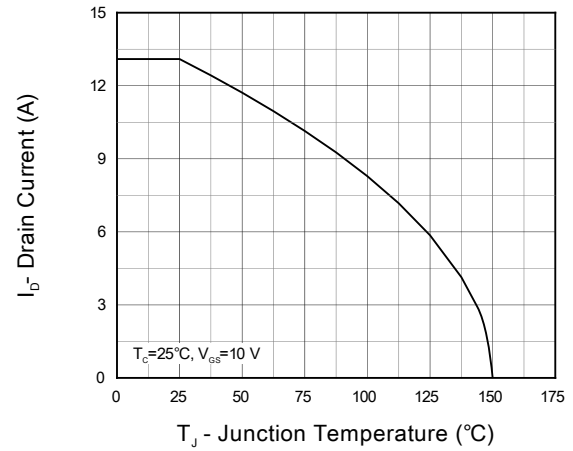


Fig 2. Current Capability

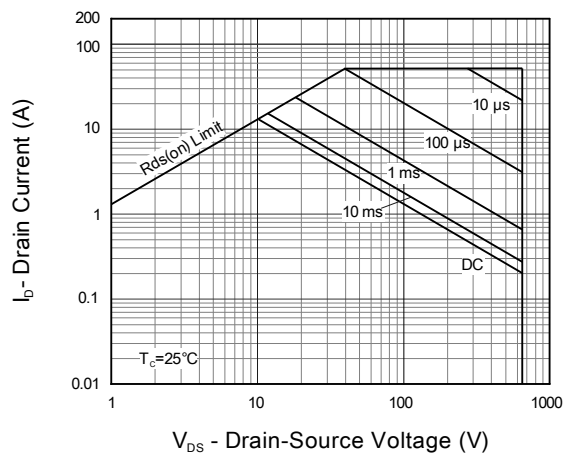


Fig 3. Safe Operation Area

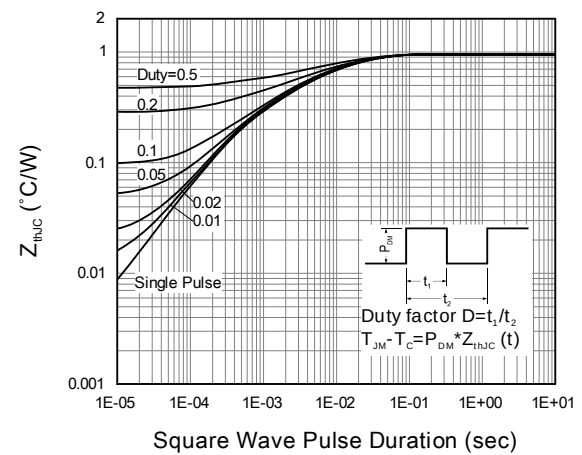


Fig 4. Transient Thermal Impedance

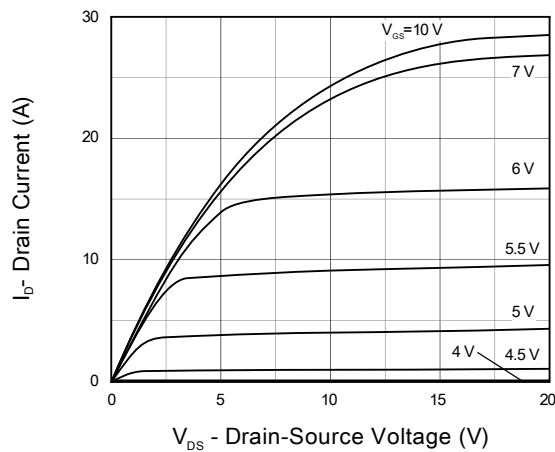


Fig 5. Output Characteristics
 $T_J = 25^\circ\text{C}$

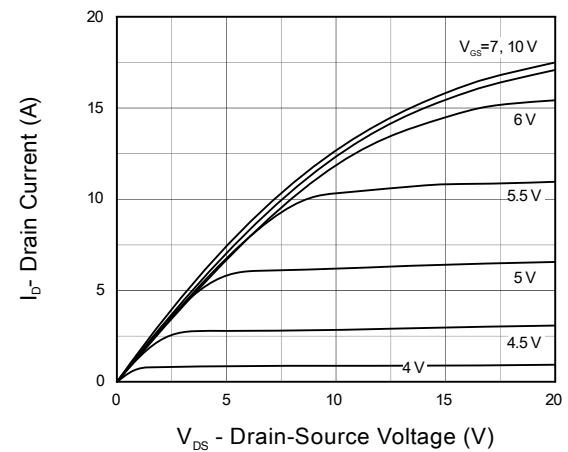


Fig 6. Output Characteristics
 $T_J = 150^\circ\text{C}$

5. Electrical Characteristics (cont.)

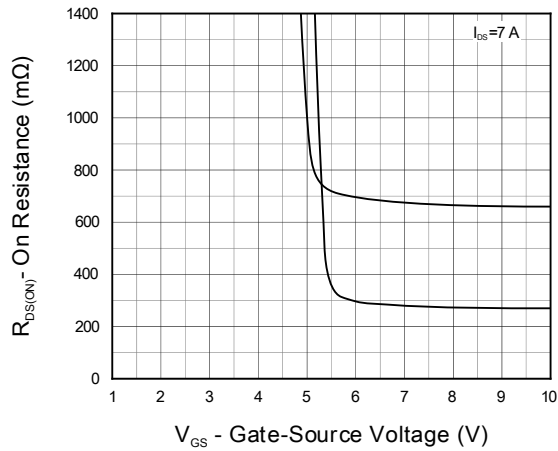


Fig 7. Transfer Characteristics

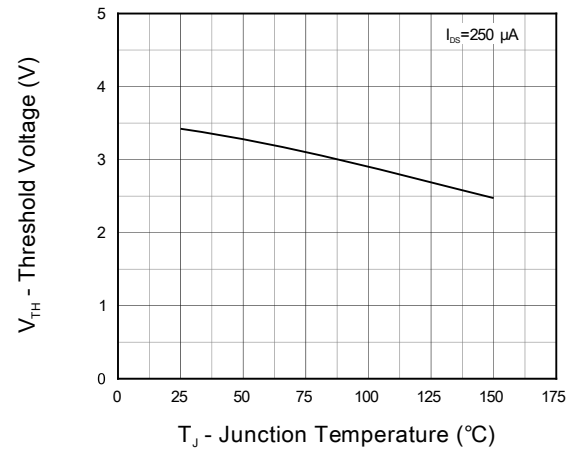


Fig 8. Normalized Threshold Voltage

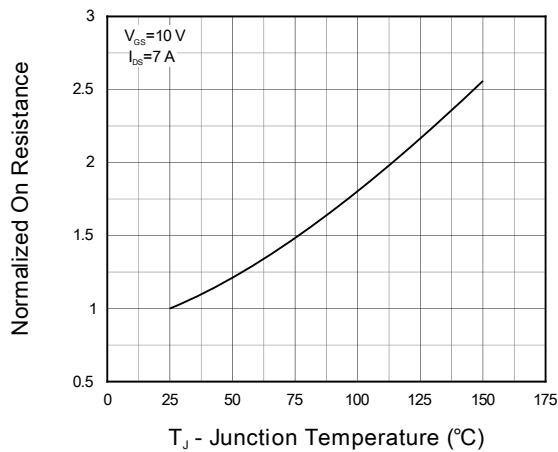


Fig 9. Normalized On Resistance

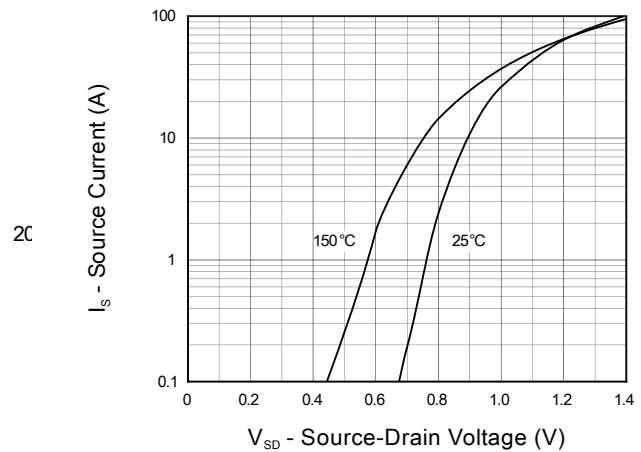


Fig 10. Diode Forward Current

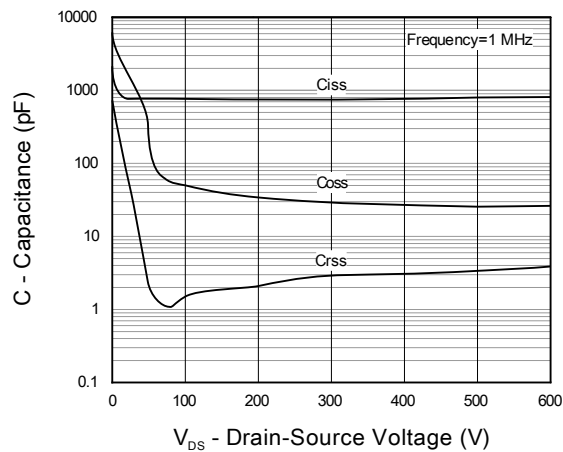


Fig 11. Capacitance

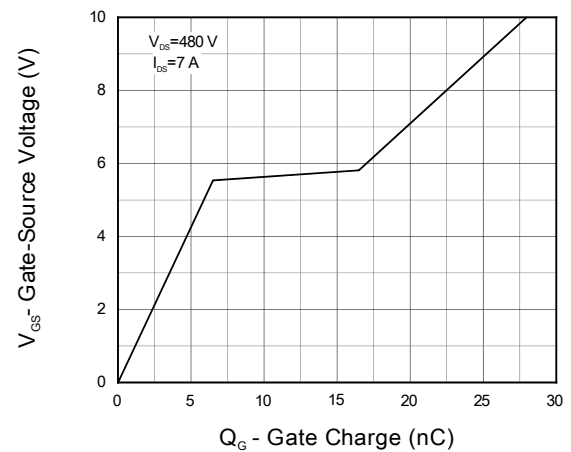
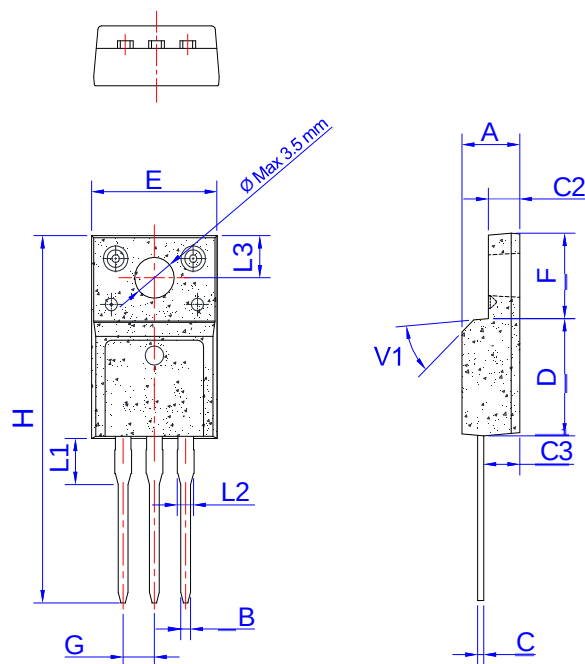


Fig 12. Gate Charge

5. Package Mechanical Data

TO-220F Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	4.50		4.90
B	0.74	0.80	0.83
C	0.47		0.65
C2	2.45		2.75
C3	2.60		3.00
D	8.80		9.30
E	9.80		10.4
F	6.40		6.80
G		2.54	
H	28.0		29.8
L1		3.63	
L2	1.14		1.70
L3		3.30	
V1		45°	