

Super-Junction Power Mosfet

1. Product Information

Features

- Low FOM $R_{DS(ON)} \times Q_G$
- Fast switching capability
- Lead free product is acquired

Applications

- Power supply
- Charger
- Solar/UPS-Micro inverter system

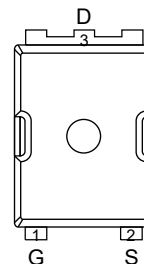
Quick reference

- $V_{DS} \geq 650\text{ V}$
- $I_D \leq 20\text{ A}$
- $R_{DS(ON)} \leq 190\text{ m}\Omega @ V_{GS} = 10\text{ V}$ (Type 150 m Ω)

Pin Description

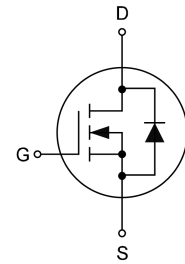
Pin	Description
1,2,3,4	Source(S)
5	Gate(G)
Tab	Drain(D)

Simplified Outline



PTO-252

Symbol



Package Marking and Ordering Information

Part number	Marking	Package	Packaging	Quantity	Reel size	Tape width
KJCF65R190Y	KJCF65R190Y	PTO-252	☒ Tape & Reel	2500 PCS	13"	16 mm
			☐ Tube	N/A	N/A	N/A

2. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	20	A
	Continuous Drain Current ($T_C=100^\circ\text{C}$)	12.6	A
I_{DM}	Pulsed Drain Current	80	A
E_{AS}	Single Pulsed Avalanche Energy (L=30 mH)	217	mJ
dv/dt	Peak Diode Recovery dv/dt	50	V/ns
I_S	Continuous diode forward current	20	A
P_D	Power Dissipation	178.6	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient	65	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-Case	0.7	$^\circ\text{C/W}$

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	650	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650 V, V _{GS} =0 V	-	-	1	μA
		V _{DS} =650 V, T _C =150 °C	-	1	-	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	3.0	-	4.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10 V, I _D =10 A	-	150	190	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100 V, V _{GS} =0 V, f=1 MHz	-	1522	-	pF
C _{oss}	Output Capacitance		-	72	-	pF
C _{rss}	Reverse Transfer Capacitance		-	1.8	-	pF
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =400 V, I _D =10 A, R _G =27 Ω, V _{GS} =10 V	-	36	-	ns
t _r	Turn-on Rise Time		-	30	-	ns
t _{d(off)}	Turn-off Delay Time		-	192	-	ns
t _f	Turn-off Fall Time		-	25	-	ns
R _g	Gate resistance	f=1 MHz	-	7.5	-	Ω
Q _g	Total Gate Charge	V _{DS} =480 V, I _D =10 A, V _{GS} =10 V	-	45	-	nC
Q _{gs}	Gate-Source Charge		-	9	-	nC
Q _{gd}	Gate-Drain Charge		-	22	-	nC
Source-Drain Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0 V, I _F =10 A	-	0.85	1.1	V
Q _{rr}	Reverse Recovery Time	V _R =400 V, I _F =10 A, di/dt=100 A/μs	-	4.5	-	μC
T _{rr}	Reverse Recovery Charge		-	293	-	ns

4. Electrical Characteristics

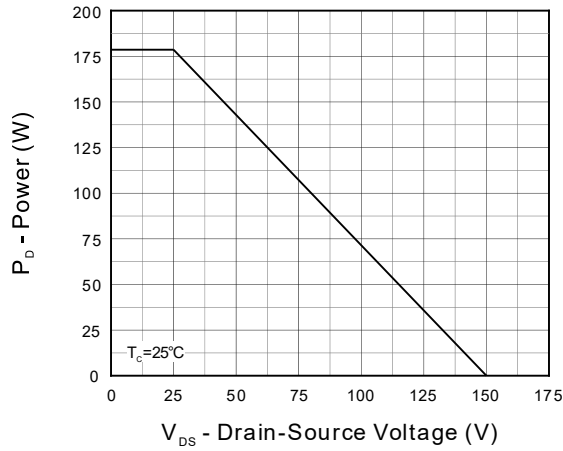


Fig 1. Power Capability

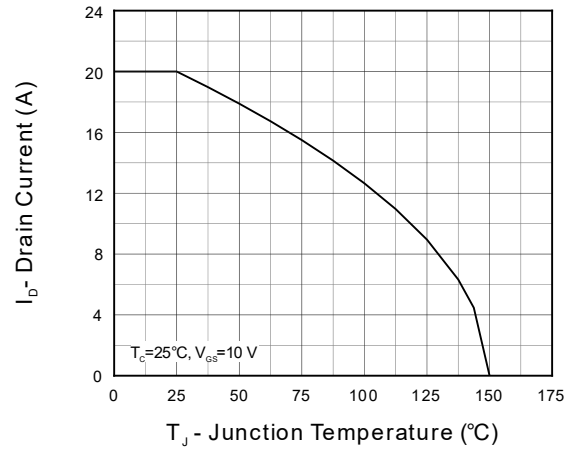


Fig 2. Current Capability

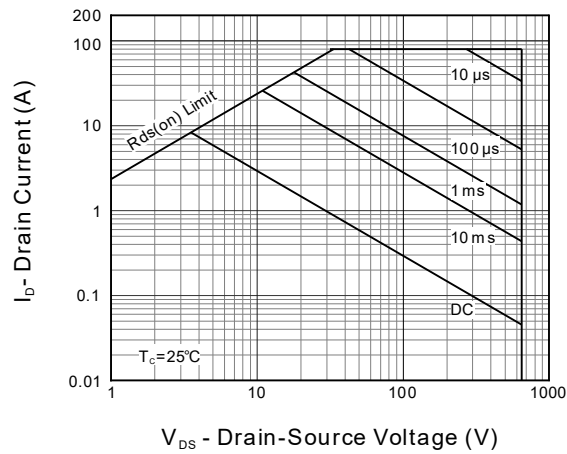


Fig 3. Safe Operation Area

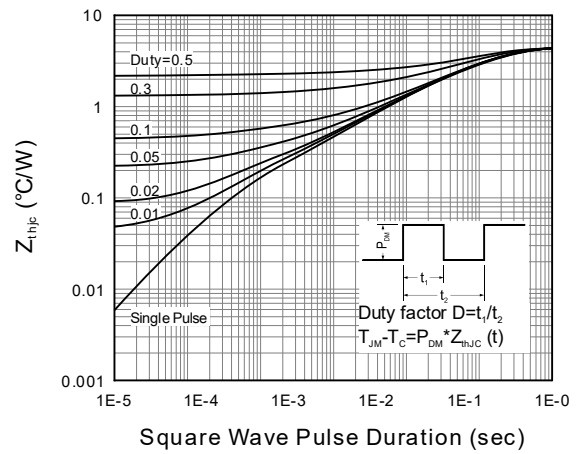


Fig 4. Transient Thermal Impedance

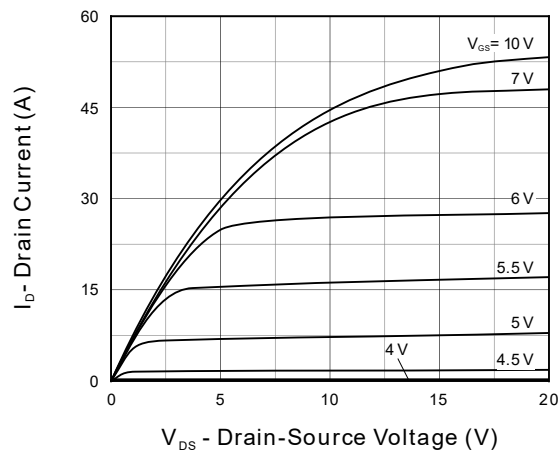


Fig 5. Output Characteristics
 $T_J = 25^\circ\text{C}$

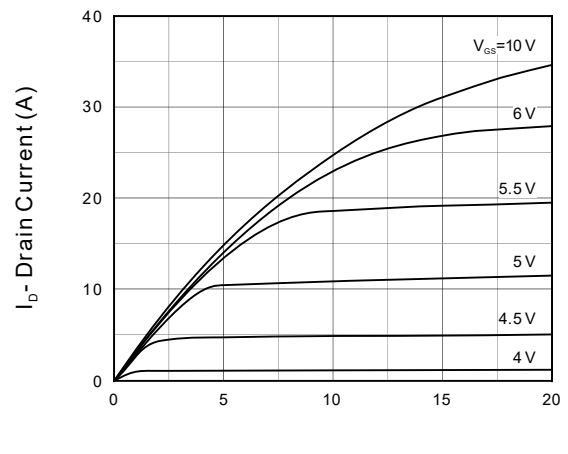


Fig 6. Output Characteristics
 $T_J = 150^\circ\text{C}$

5. Electrical Characteristics (cont.)

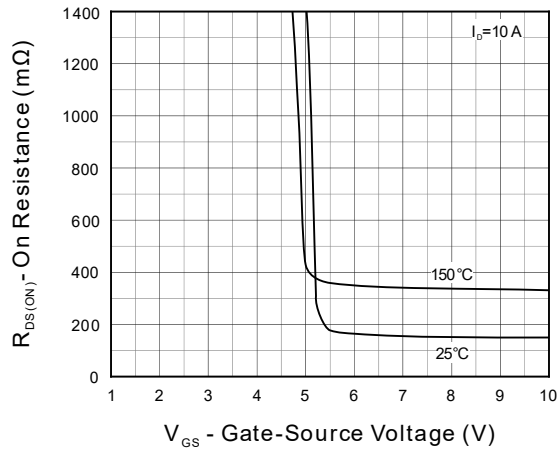


Fig 7. Transfer Characteristics

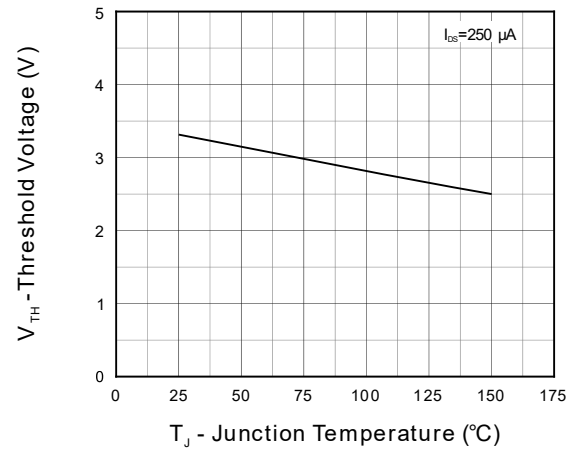


Fig 8. V_{TH} vs. Junction Temperature

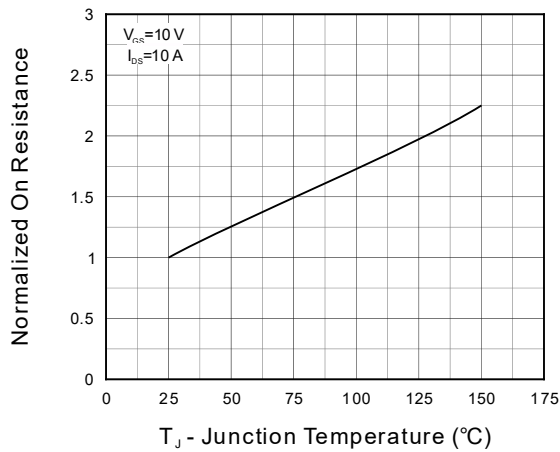


Fig 9. Normalized On Resistance

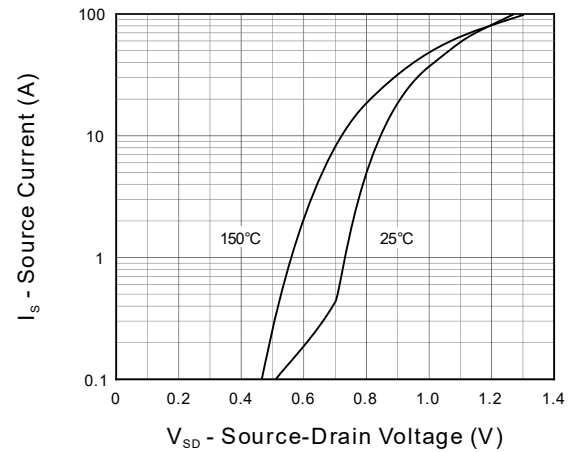


Fig 10. Diode Forward Current

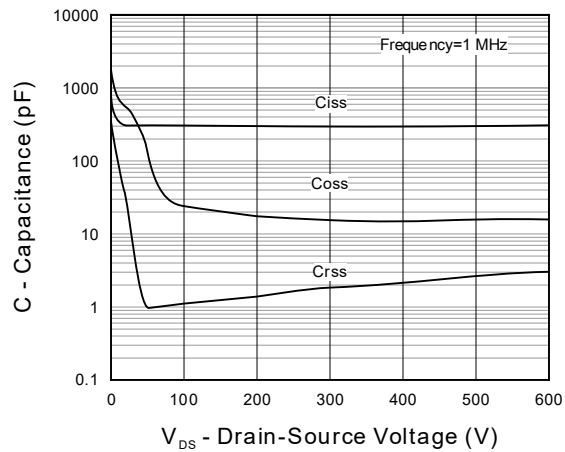


Fig 11. Capacitance

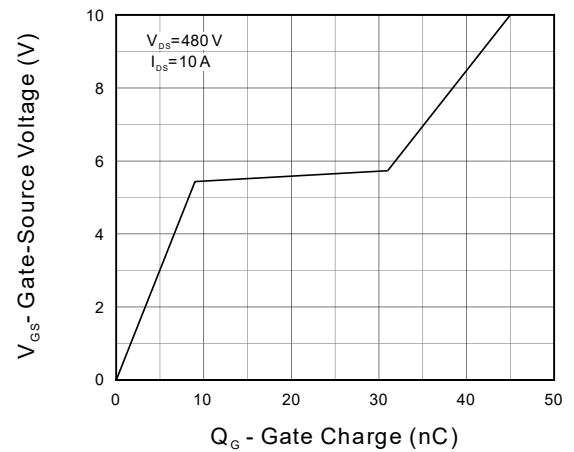
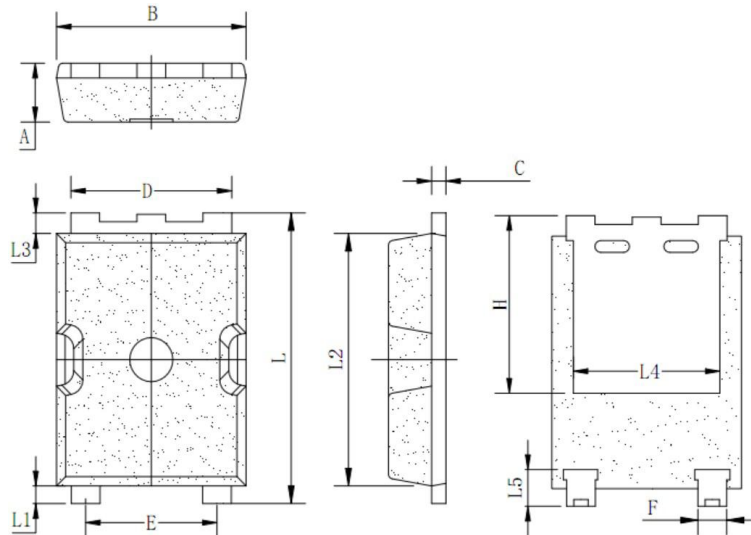


Fig 12. Gate Charge

5. Package Mechanical Data

PTO-252 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.95	2.05
B	6.55	6.65
C	0.47	0.55
D	5.50	5.70
E	4.55	4.65
F	0.95	1.05
H	5.90	6.20
L	9.85	9.95
L1	0.55	0.65
L2	8.55	8.65
L3	0.65	0.75
L4	4.65	4.90
L5	1.15	1.35