

Super-Junction Power Mosfet

1. Product Information

Features

- Ultra-fast body diode
- Good Reliability
- 100% UIS and isolation tested
- RoHs compliant

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

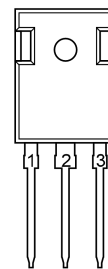
Quick reference

- $V_{DS} = 600V$
- $I_D = 70A$
- $R_{DS(ON)} \leq 38m\Omega @ V_{GS}=10V$ (Type: 33m Ω)

Pin Description

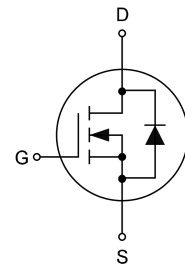
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-247

Symbol



Package Marking and Ordering Information

Part number	Marking	Package	Packaging	Quantity	Reel size	Tape width
KJCF60R033P	KJCF60R033P	TO-247	☐ Tape & Reel	N/A	N/A	N/A
			☒ Tube	60 PCS	N/A	N/A

2. Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Continuous Drain Current, $T_A=25^\circ C$, $V_{GS}@10V$ ¹	70	A
	Continuous Drain Current, $T_A=100^\circ C$, $V_{GS}@10V$ ¹	50	A
I_{DM}	Pulsed Drain Current ^{1,2}	280	A
E_{AS}	Single Pulse Avalanche Energy ³	1200	mJ
P_D	Power Dissipation	429	W
dv/dt	Reverse diode dv/dt	50	V/ns
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient, Steady-State ⁴	48	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance from Junction to Case, Steady-State ⁴	0.35	$^\circ C/W$
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~175	$^\circ C$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	600	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V, T _J =125°C	-	-	5	μA
I _{GSS}	Gate-body Leakage current	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	3.0	3.6	4.2	V
R _{DS(on)}	Drain-Source on-Resistance	V _{GS} =10V, I _D =25A	-	33	38	mΩ
Dynamic characteristics						
C _{iss}	Input Capacitance	V _{DS} =100V, V _{GS} =0V, f=100KHz	-	5125	-	pF
C _{oss}	Output Capacitance		-	220	-	
C _{rss}	Reverse Transfer Capacitance		-	10	-	
Switching characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =480V, I _D =25A, R _G =27Ω, V _{GS} =10V	-	170	-	ns
t _r	Turn-on Rise Time		-	117	-	
t _{d(off)}	Turn-off Delay Time		-	598	-	
t _f	Turn-off Fall Time		-	133	-	
Q _g	Total Gate Charge	V _{DS} =480V, I _D =25A, V _{GS} =10V	-	203	-	nC
Q _{gs}	Gate-Source Charge		-	48	-	
Q _{gd}	Gate-Drain Charge		-	127	-	
Source-Drain Diode characteristics						
V _{SD}	Diode Forward Voltage	I _S =25A, V _{GS} =0V	-	0.9	1.2	V
Q _{rr}	Reverse Recovery Charge	V _R =400V, I _F =25A, di _F /dt=100A/us	-	1.5	-	μC
t _{rr}	Reverse Recovery Time		-	188	-	ns

Notes:

1. The max drain current rating limited by package and maximum junction temperature.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. E_{AS} Condition: T_J=25°C, V_{DD}=100V, R_G=25Ω, L=30mH, I_{AS}=10A.
4. Mount on minimum PCB layout.

4. Electrical Characteristics

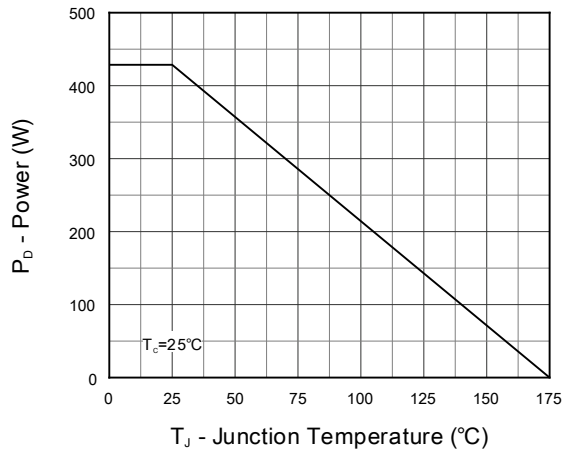


Fig 1. Power Capability

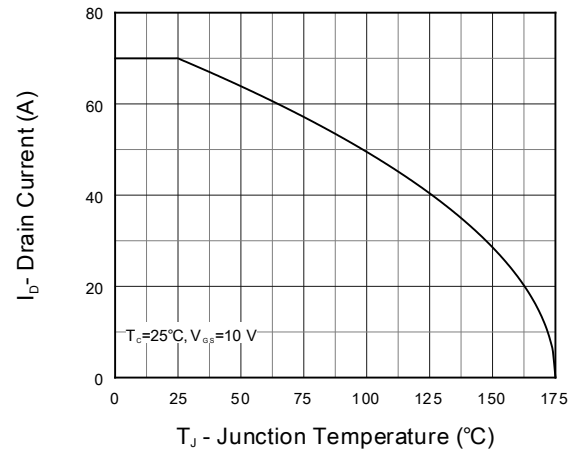


Fig 2. Current Capability

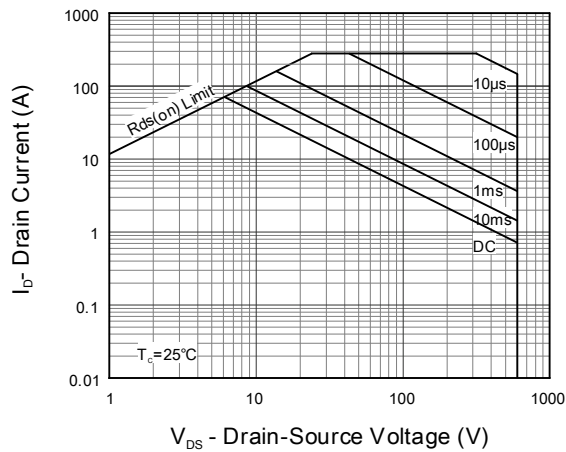


Fig 3. Safe Operation Area

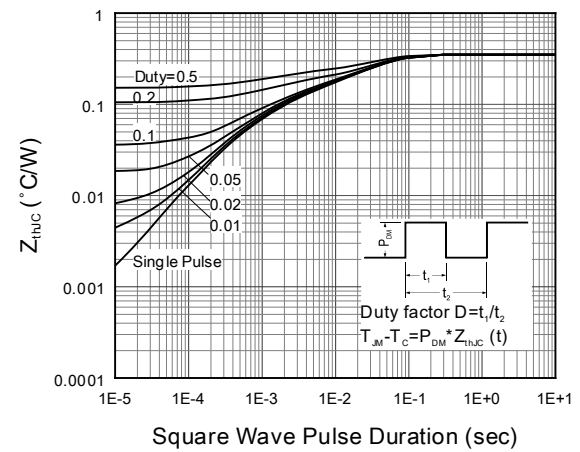


Fig 4. Transient Thermal Impedance

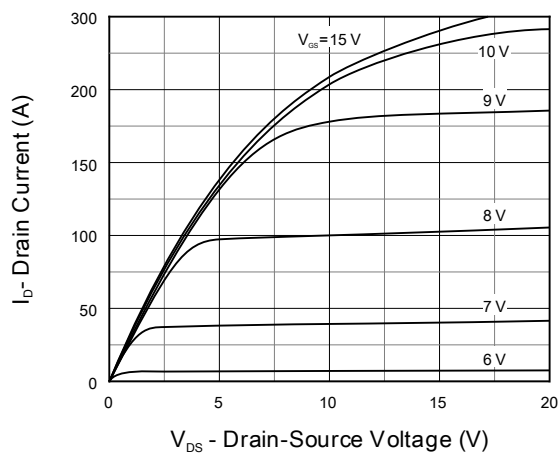


Fig 5. Output Characteristics
 $T_J=25^{\circ}\text{C}$

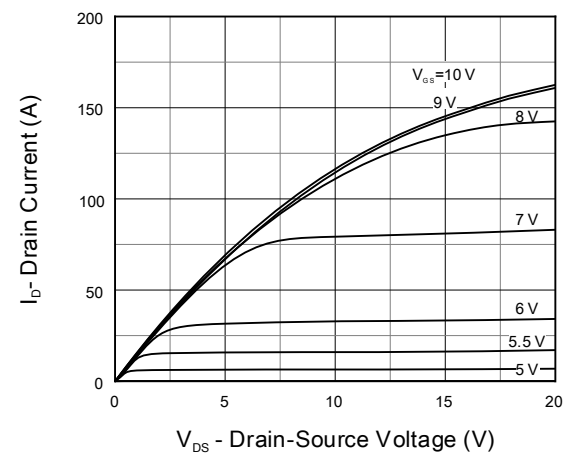


Fig 6. Output Characteristics
 $T_J=150^{\circ}\text{C}$

4. Electrical Characteristics (cont.)

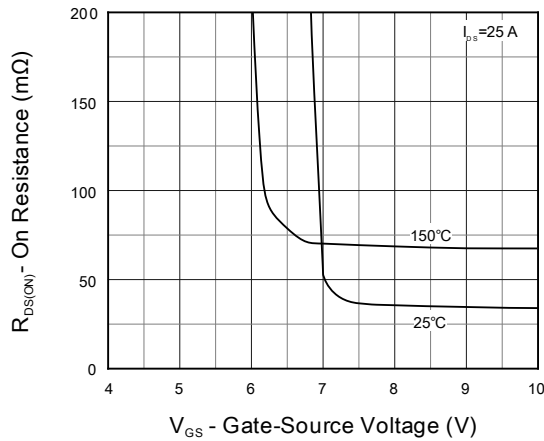


Fig 7. Transfer Characteristics

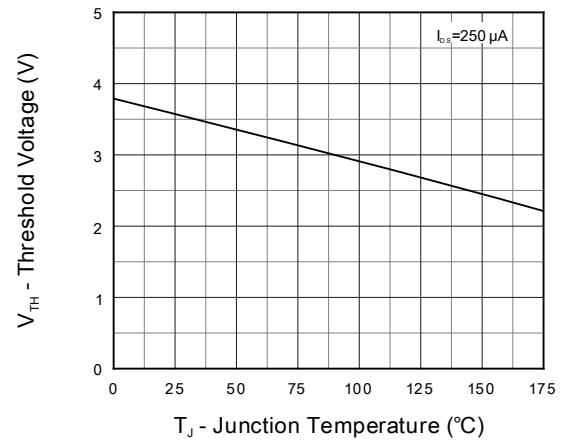


Fig 8. Normalized Threshold Voltage

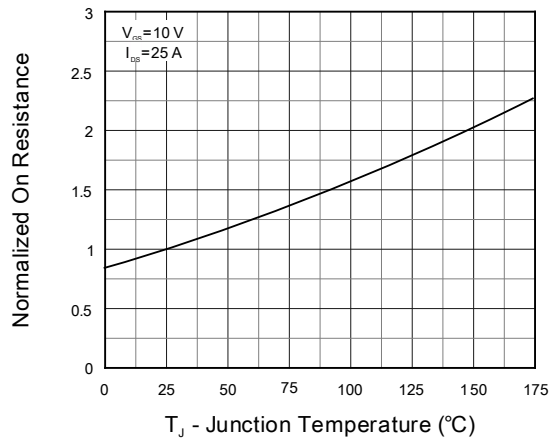


Fig 9. Normalized On Resistance

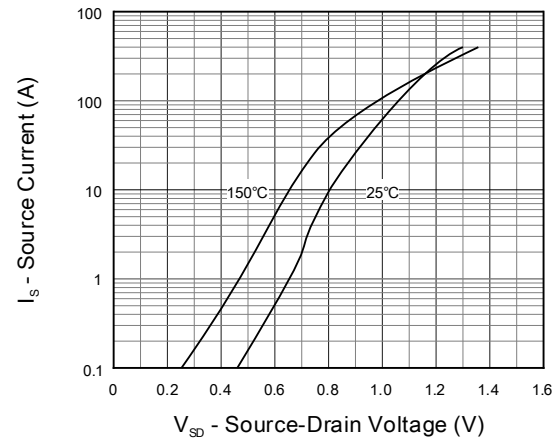


Fig 10. Diode Forward Current

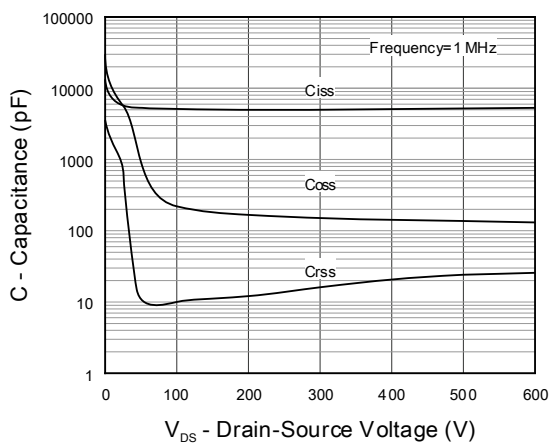


Fig 11. Capacitance

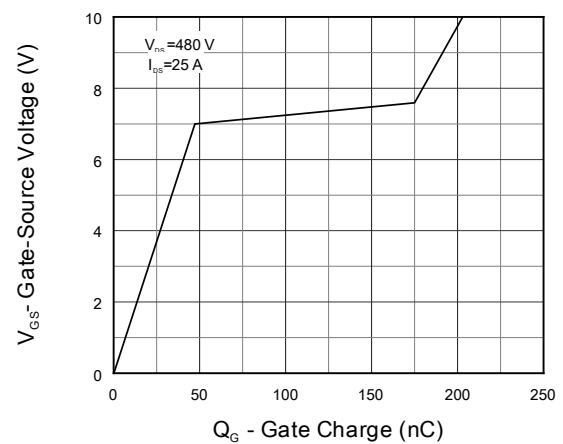
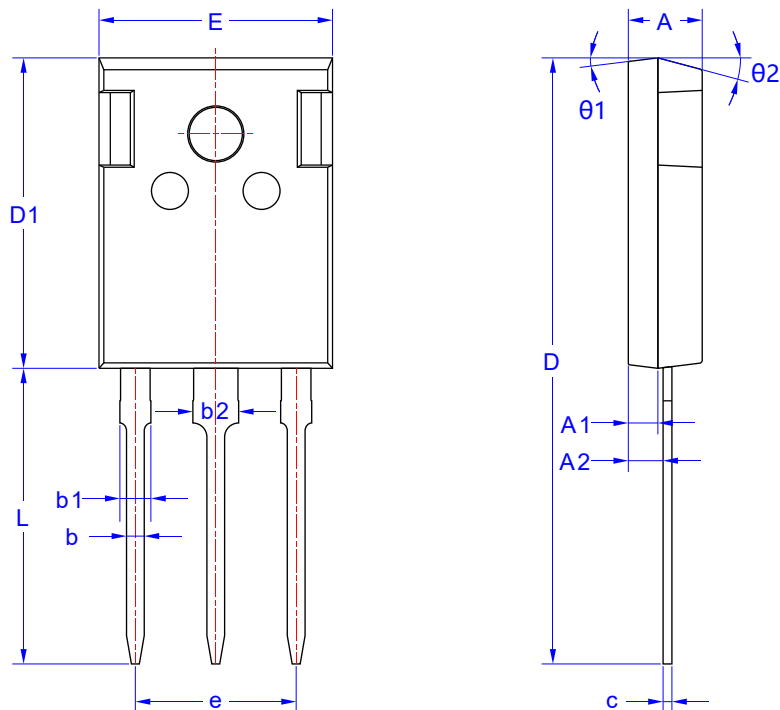


Fig 12. Gate Charge

5. Package Mechanical Data

TO-247 Package



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°	