

P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low thermal resistance

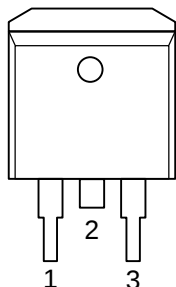
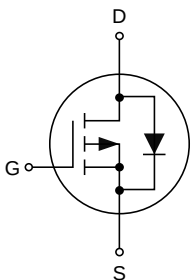
1.2 Applications

- ☒ Motor drivers
- ☒ DC/DC converter

1.3 Quick reference

- ☒ $BV \geq -100\text{ V}$
- ☒ $P_D \leq 375\text{ W}$
- ☒ $I_D \leq -90\text{ A}$
- ☒ $R_{DS(ON)} \leq 19\text{ m}\Omega @V_{GS} = -10\text{ V}$
- ☒ $R_{DS(ON)} \leq 22\text{ m}\Omega @V_{GS} = -4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate	 Top View TO-263	
2	Drain		
3	Source		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	-	-100	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=-10\text{ V}$	-	-90	A
		$T_C=100^{\circ}\text{C}, V_{GS}=-10\text{ V}$	-	-63	A
$I_{DM}^{*,**}$	Pulsed Source Current	$T_C=25^{\circ}\text{C}, V_{GS}=-10\text{ V}$	-	-200	A
P_D^*	Drain Power Dissipation	$T_C=25^{\circ}\text{C}$	-	375	W
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	-90	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=-50\text{ V}, L=1.0\text{ mH}$	-	684	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	60	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.4	

Notes:

* Surface mounted on 1 in² pad area, $t \leq 10\text{ sec}$

** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

*** Limited by bonding wire

4. Marking Information

Product Name	Marking
KJ180P10D	KJ180P10D YWWXXX

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity (pcs)
KJ180P10D	TO-263	13"	24 mm	800

Note: KUAJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

6. Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

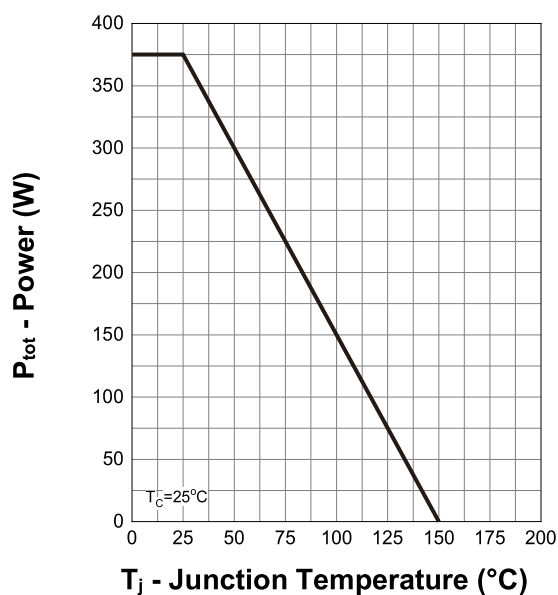
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =-250 μA	-100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250 μA	-1	-	-2	V
I _{DSS}	Drain Leakage Current	V _{DS} =-80 V, V _{GS} =0 V	-	-	-1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =-10 V, I _{DS} =-30 A	-	17	19	mΩ
		V _{GS} =-4.5 V, I _{DS} =-20 A	-	18	22	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-30 A, V _{GS} =0 V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =-30 A, V _{GS} =0 V, dI _{SD} /dt=100 A/μs	-	43	-	ns
Q _{rr}	Reverse Recovery Charge		-	76	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-50 V, Frequency=1 MHz	-	13905	-	pF
C _{oss}	Output Capacitance		-	301	-	
C _{rss}	Reverse Transfer Capacitance		-	42	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-50 V, V _{GEN} =-10 V, R _G =3.9 Ω, R _L =1.66 Ω, I _{DS} =-30 A	-	13	-	ns
t _r	Turn-on Rise Time		-	45	-	
t _{d(off)}	Turn-off Delay Time		-	329	-	
t _f	Turn-off Fall Time		-	95	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =-50 V, V _{GS} =-10 V, I _{DS} =-30 A	-	236	-	nC
Q _{gs}	Gate-Source Charge		-	55	-	
Q _{gd}	Gate-Drain Charge		-	27	-	

Notes:

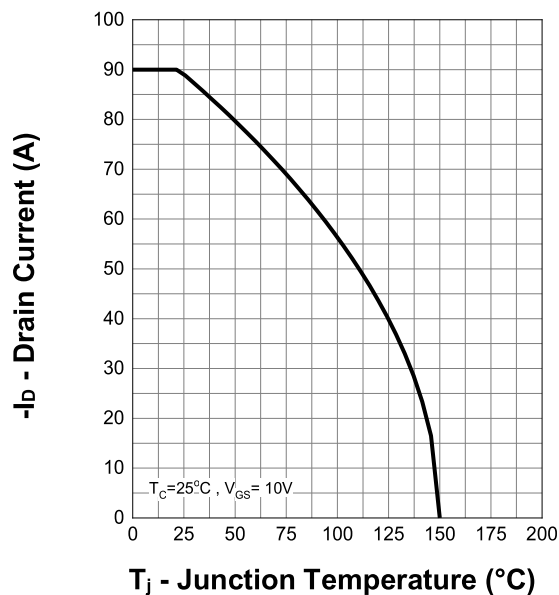
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%
- Guaranteed by design, not subject to production testing

7. Typical Characteristics

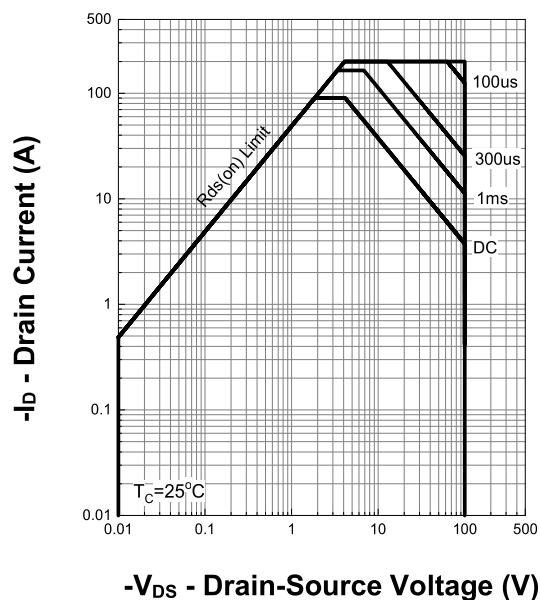
Power Capability



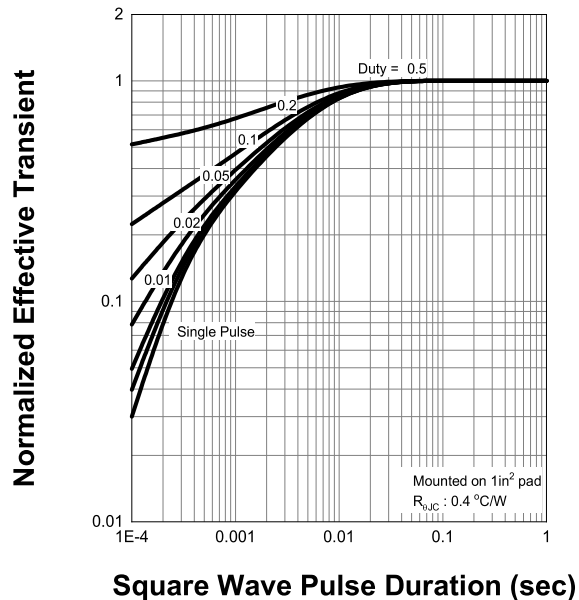
Current Capability



Safe Operating Area

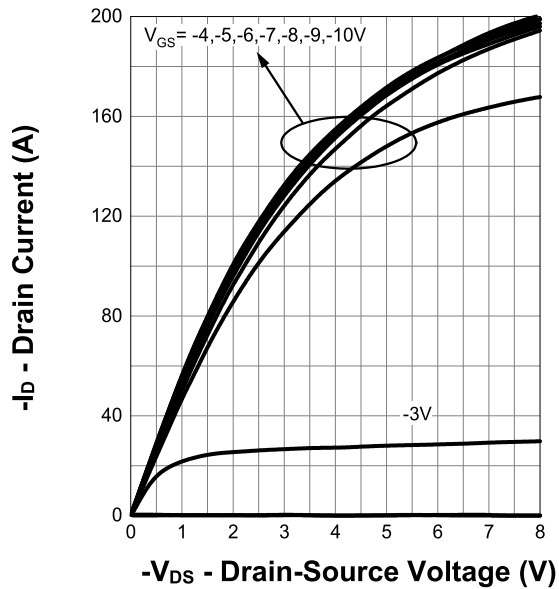


Transient Thermal Impedance

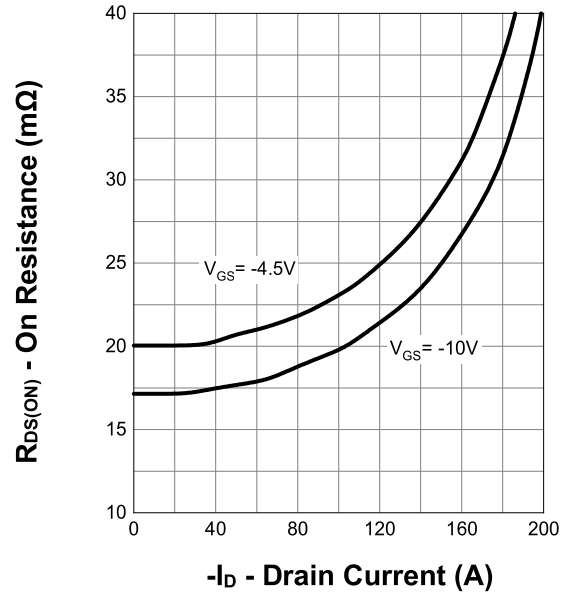


7. Typical Characteristics (cont.)

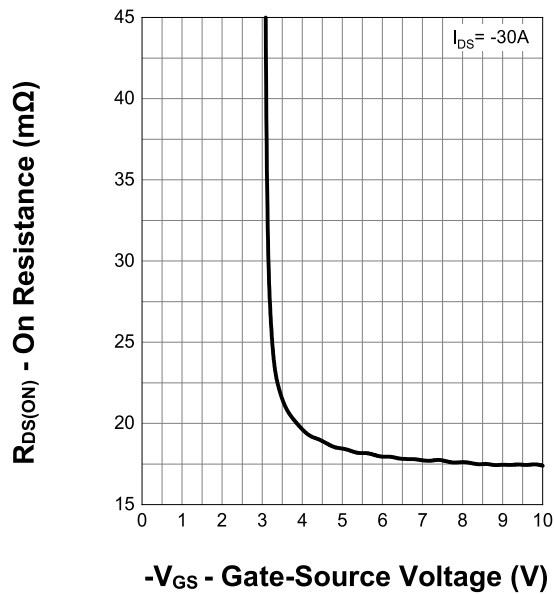
Output Characteristics



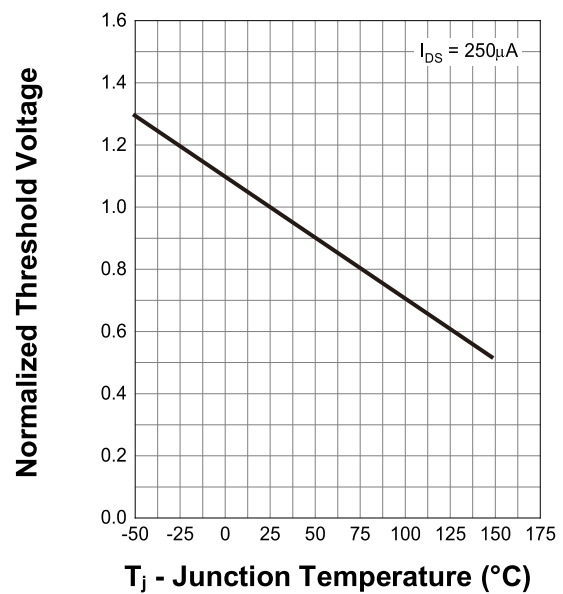
On Resistance



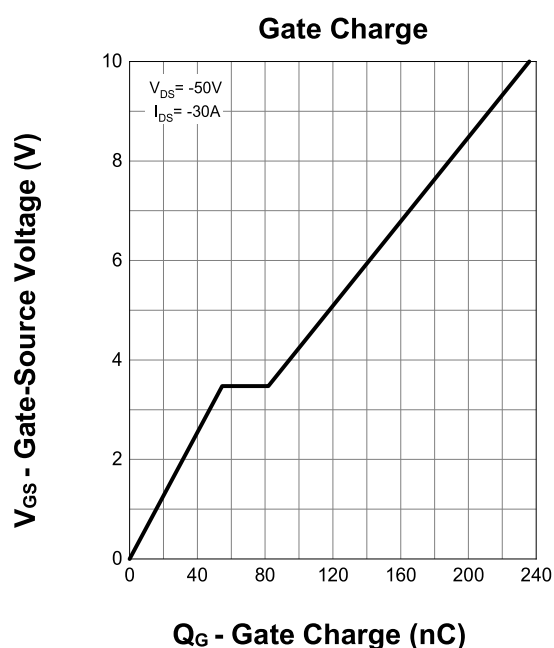
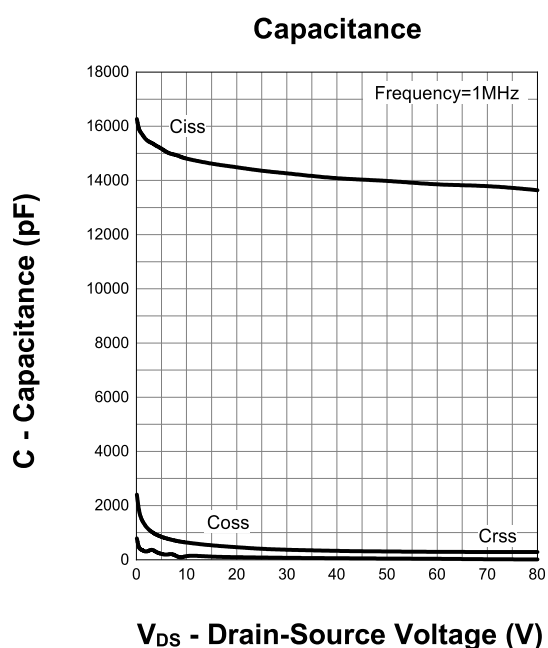
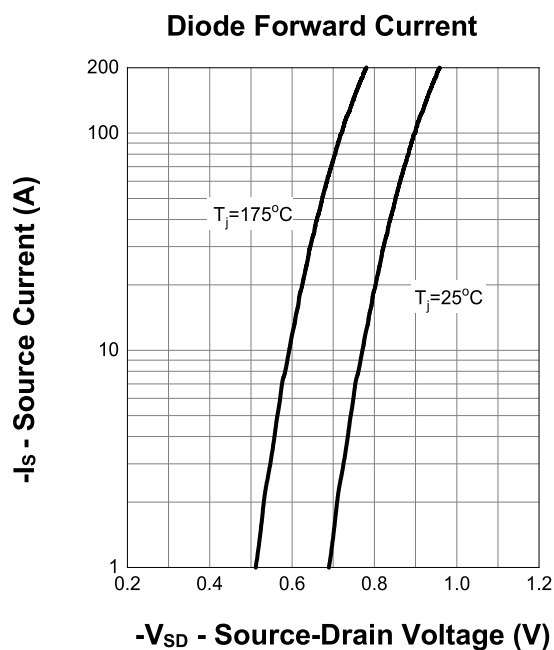
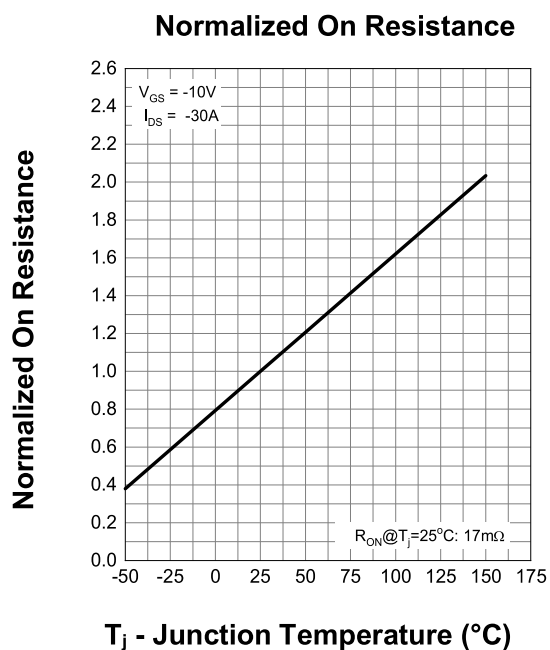
Transfer Characteristics



Normalized Threshold Voltage

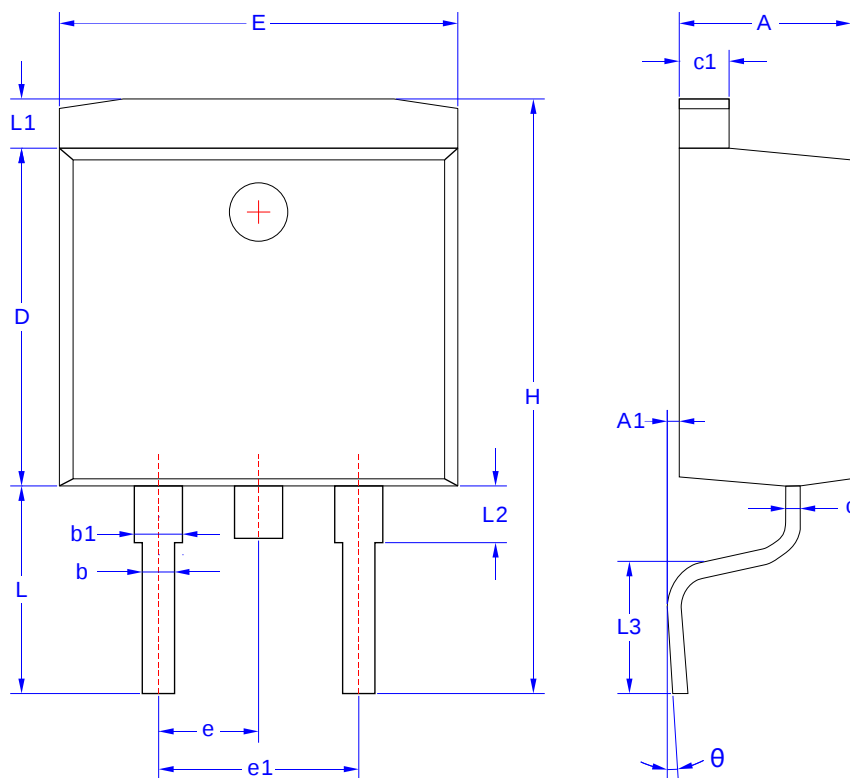


7. Typical Characteristics (cont.)



8. Package Dimensions

TO-263 Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	4.470	-	4.670
A1	0.000	-	0.150
b	0.710	-	0.910
b1	1.170	-	1.370
c	0.310	-	0.530
c1	1.170	-	1.370
D	8.500	-	8.900
E	10.01	-	10.31
e	2.540 BSC		
e1	4.980	-	5.180
H	14.940	-	15.500
L	4.950	-	5.450
L1	1.120	-	1.420
L2	1.300	-	1.700
L3	2.340	-	2.740
θ	0°	-	8°