

P-Channel Enhancement Mode MOSFET

1. Product Information

Features

Advanced trench cell design
Excellent $R_{DS(ON)}$ and Low Gate

Applications

Brushless motor
Load switch
Uninterruptible power supply

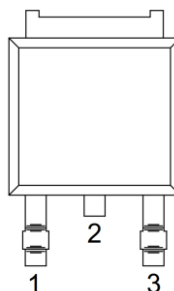
Quick reference

$V_{DS} \geq -100V$
 $I_D \leq -50A$
 $R_{DS(ON)} \leq 52m\Omega @ V_{GS} = -4.5V$ (Type: 40m Ω)

Pin Description

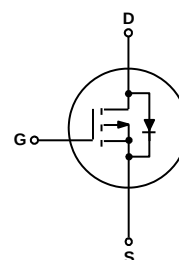
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-252-3L

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ50P10K	TO-252-3L	50P10 YWWXXX	YWWXXX: Date Code		2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_{D@T_C=25^\circ C}$	Continuous Drain Current, $V_{GS} @ -10V^1$	-50	A
$I_{D@T_C=100^\circ C}$	Continuous Drain Current, $V_{GS} @ -10V^1$	-28	A
I_{DM}	Pulsed Drain Current ²	-150	A
EAS	Single Pulse Avalanche Energy ³	87	mJ
I_{AS}	Avalanche Current	-35	A
$P_{D@T_C=25^\circ C}$	Total Power Dissipation ⁴	140	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.1	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-100	-	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =-100V, V _{GS} =0V,	-	-	-1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.6	-2.5	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =-10V, I _D =-20A	-	40	52	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	44	62	
Ciss	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, f=1.0MHz	-	2120	-	pF
Coss	Output Capacitance		-	194	-	pF
Crss	Reverse Transfer Capacitance		-	13	-	pF
Q _g	Total Gate Charge	V _{DS} =-50V, I _D =-5A, V _{GS} =-10V	-	40	-	nC
Q _{gs}	Gate-Source Charge		-	7.8	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	8.6	-	nC
td(on)	Turn-on Delay Time	V _{DD} =-50V, I _D =-5A, R _G =6Ω, V _{GS} =-10V	-	13	-	ns
tr	Turn-on Rise Time		-	39	-	ns
td(off)	Turn-off Delay Time		-	100.1	-	ns
tr	Turn-off Fall Time		-	105.3	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-35	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-140	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =-30A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	T _J =25°C, I _F =-5A, dI/dt=100A/μs	-	104	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	280	-	nC

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V DD =-25V,V GS =-10V,L=0.1mH,IAS =-24A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

4. Typical Characteristics

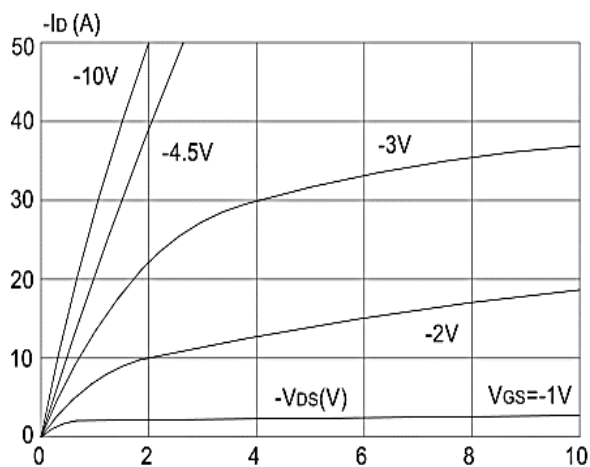


Figure 1: Output Characteristics

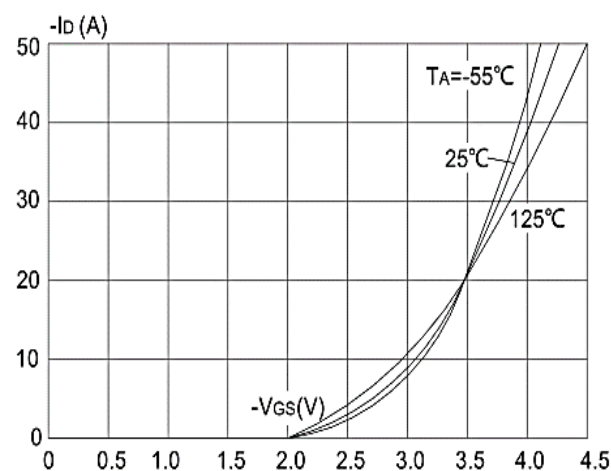


Figure 2: Typical Transfer Characteristics

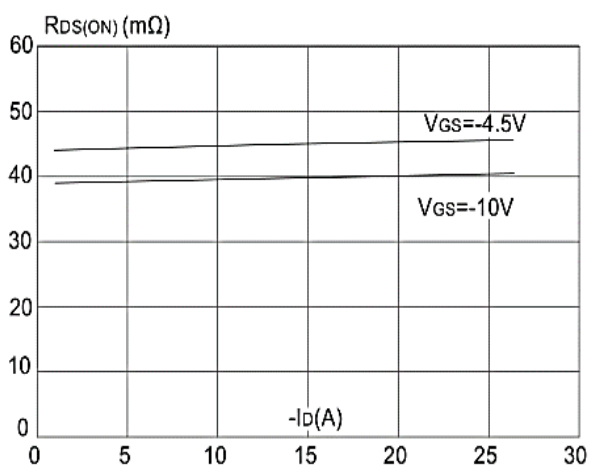


Figure 3: On-resistance vs. Drain Current

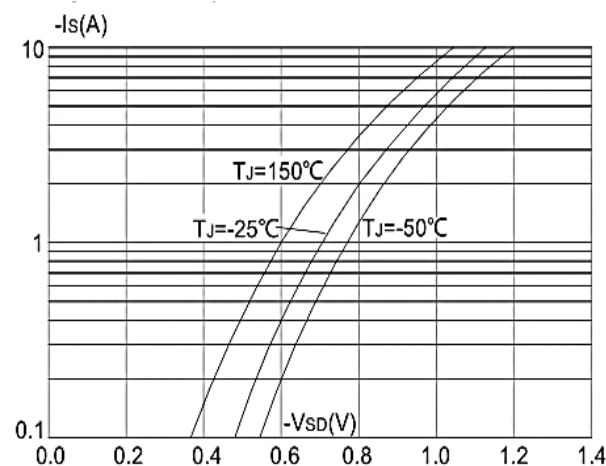


Figure 4: Body Diode Characteristics

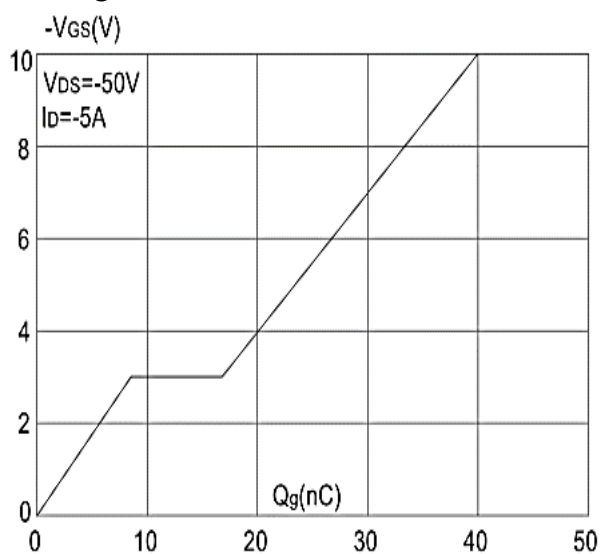


Figure 5: Gate Charge Characteristics

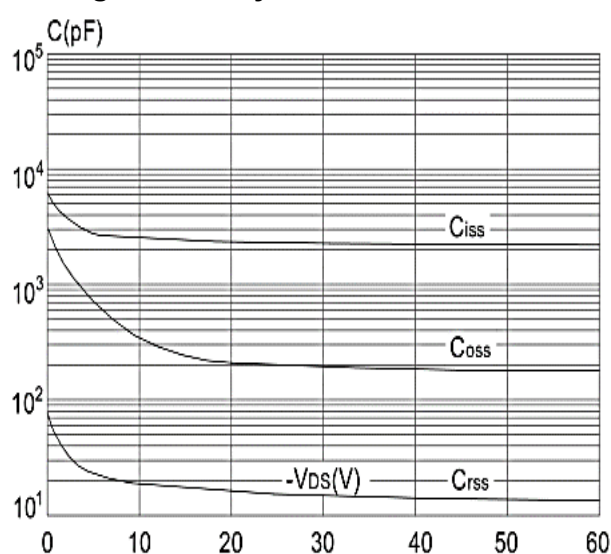


Figure 6: Capacitance Characteristics

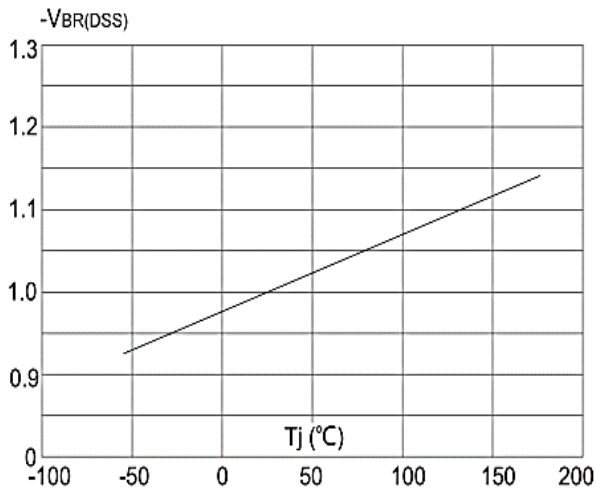


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

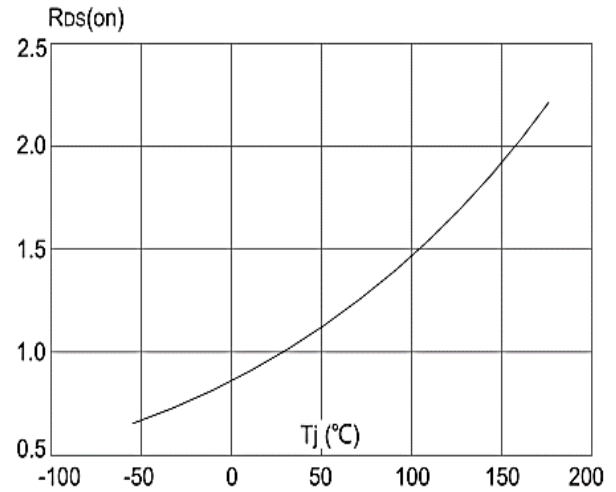


Figure 8: Normalized on Resistance vs. Junction Temperature

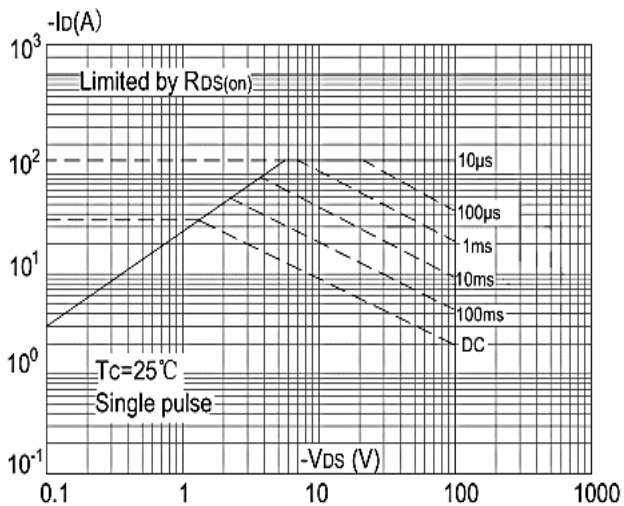


Figure 9: Maximum Safe Operating Area

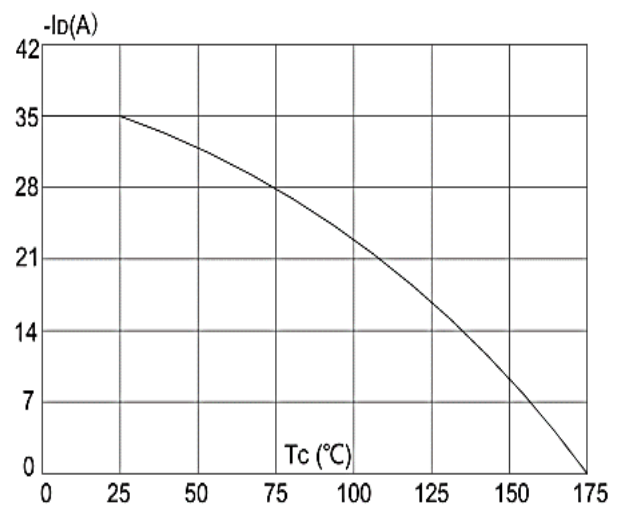


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

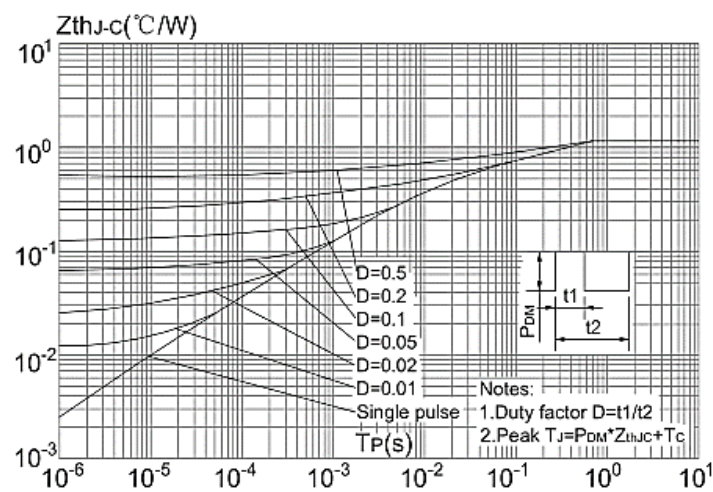
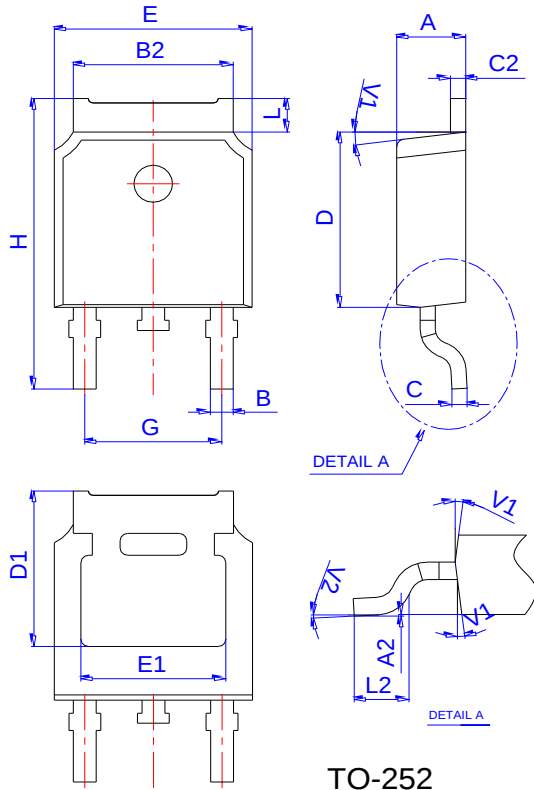


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

5.Package Mechanical Data

TO-352-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252

