

• General Description

The TF110P02K combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

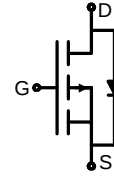
• Features

Advance high cell density Trench technology
Low $R_{DS(ON)}$ to minimize conductive loss
Low Gate Charge for fast switching
Low Thermal resistance

• Application

Load Switches
DC/DC
BLDC Motor driver

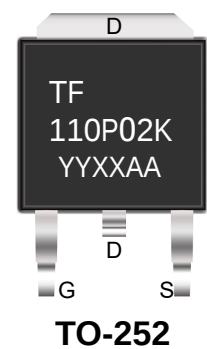
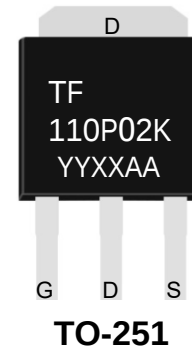
• Product Summary



$$V_{DS} = -20V \quad I_D = -30A$$

$$R_{DS(ON)}(-4.5V \text{ typ}) = 10.5m\Omega$$

$$R_{DS(ON)}(-2.5V \text{ typ}) = 14.5m\Omega$$



• Ordering Information:

Part NO.	TF110P02K
Marking1	TF:tuofeng; 110P02K:TF110P02K
Marking2	YY:year code; XX:Week; AA:device code;
Basic ordering unit (pcs)	2500

• Absolute Maximum Ratings ($T_c = 25^\circ C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	-30	A
	$I_{D@TC=75^\circ C}$	-21	A
	$I_{D@TC=100^\circ C}$	-18	A
Pulsed Drain Current ^①	I_{DM}	-63	A
Total Power Dissipation ^②	P_D	15	W
Total Power Dissipation($T_A=25^\circ C$)	$P_{D@T_A=25^\circ C}$	1.0	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy@ $L=0.1mH$	E_{AS}	42	mJ
Avalanche Current@ $L=0.1mH$	I_{AS}	-28	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R_{thJC}	-	-	4.5	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	62.5	° C/W
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	265	° C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.45	-0.70	-1.00	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-15A$		10.5	12.0	m Ω
		$V_{GS}=-2.5V, I_D=-10A$		14.5	16.0	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-10A$		10		s
Source-drain voltage	V_{SD}	$I_S=-10A$		0.88	1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-10V$ $f = 1MHz$	-	2108	-	pF
Output capacitance	C_{oss}		-	275	-	
Reverse transfer capacitance	C_{rss}		-	236	-	

●Gate Charge characteristics($T_a = 25^\circ C$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD}=-10V$ $I_D=-10A$ $V_{GS}=-4.5V$	-	46	-	nC
Gate - Source charge	Q_{gs}		-	7.3	-	
Gate - Drain charge	Q_{gd}		-	10	-	

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Gate-Charge Characteristics

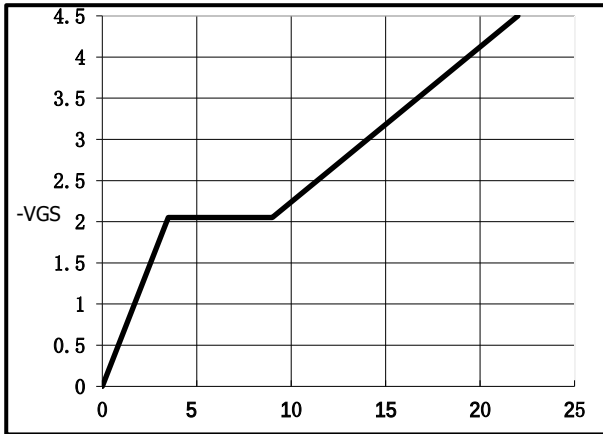


Fig.2 Capacitance Characteristics

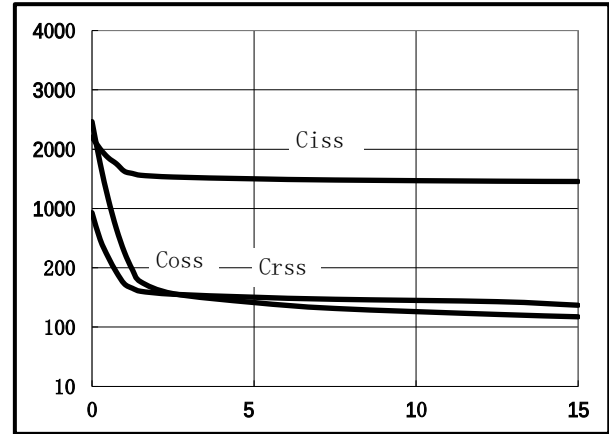


Fig.2 Power Dissipation

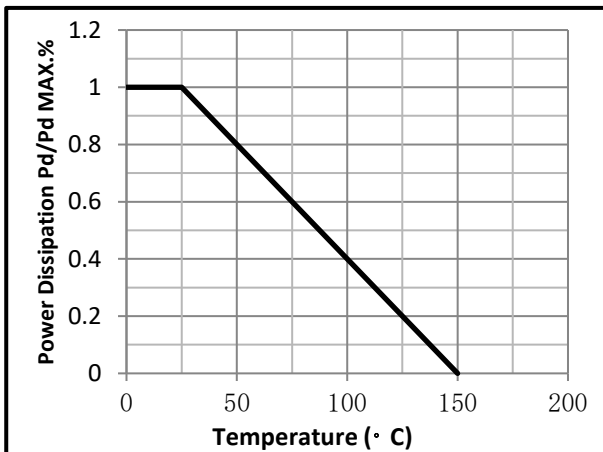


Fig.3 Typical output Characteristics

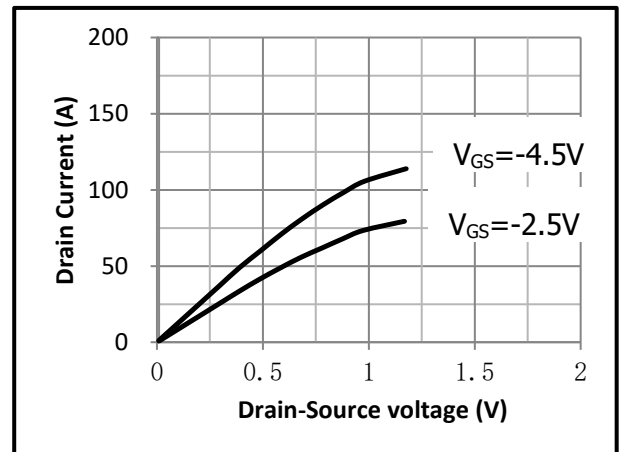


Fig.4 Threshold Voltage V.S Junction Temperature

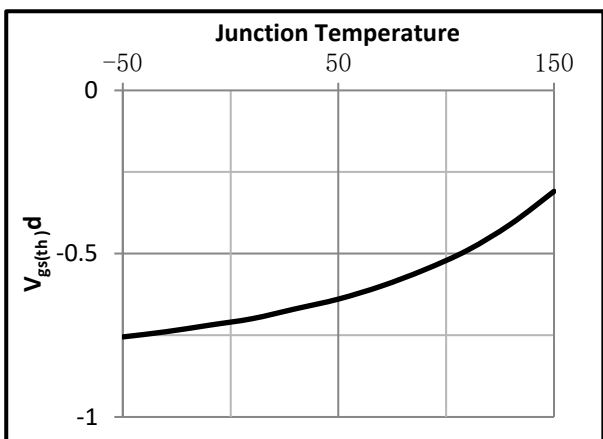


Fig.5 Resistance V.S Drain Current

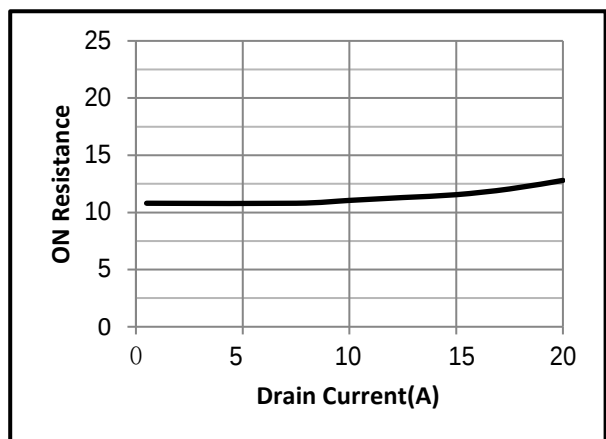


Fig.6 On-Resistance VS Gate Source Voltage

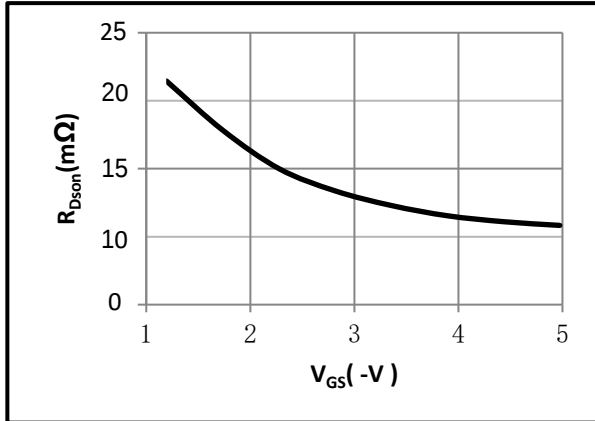


Fig.7 On-Resistance V.S Junction Temperature

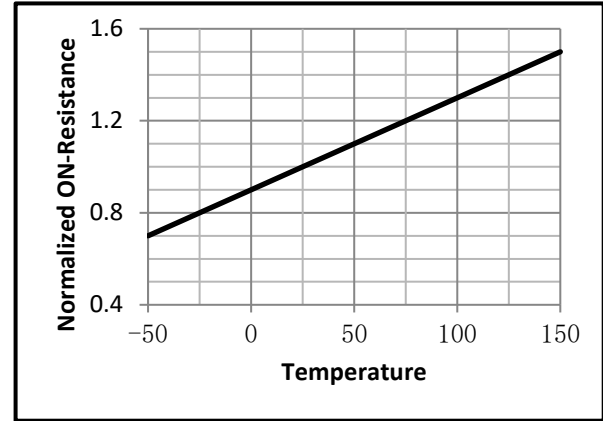


Fig.8 Switching Time Measurement Circuit

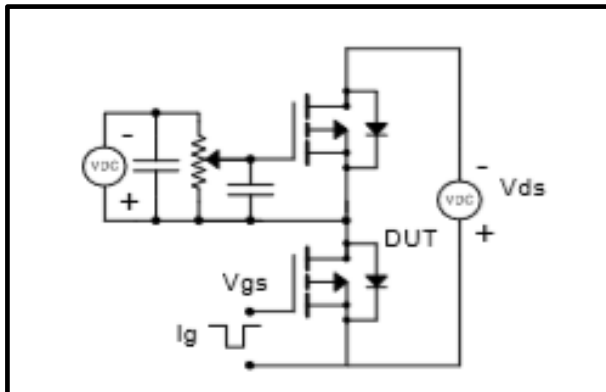


Fig.9 Gate Charge Waveform

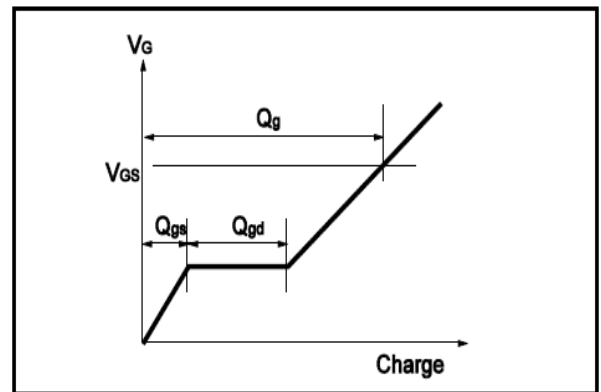


Fig.10 Switching Time Measurement Circuit

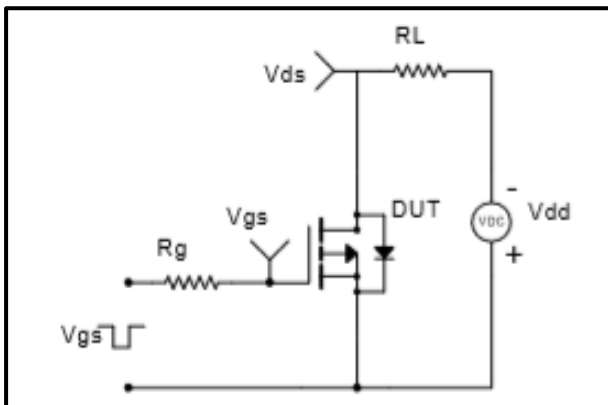
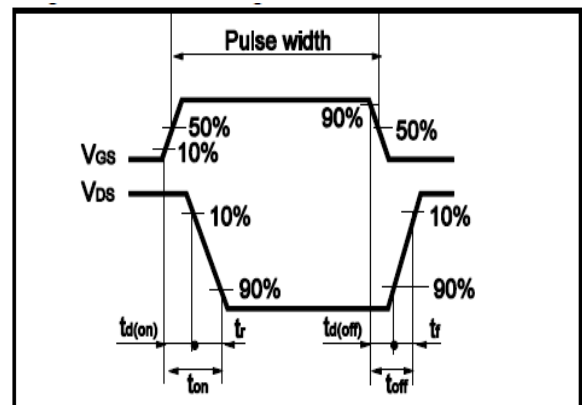
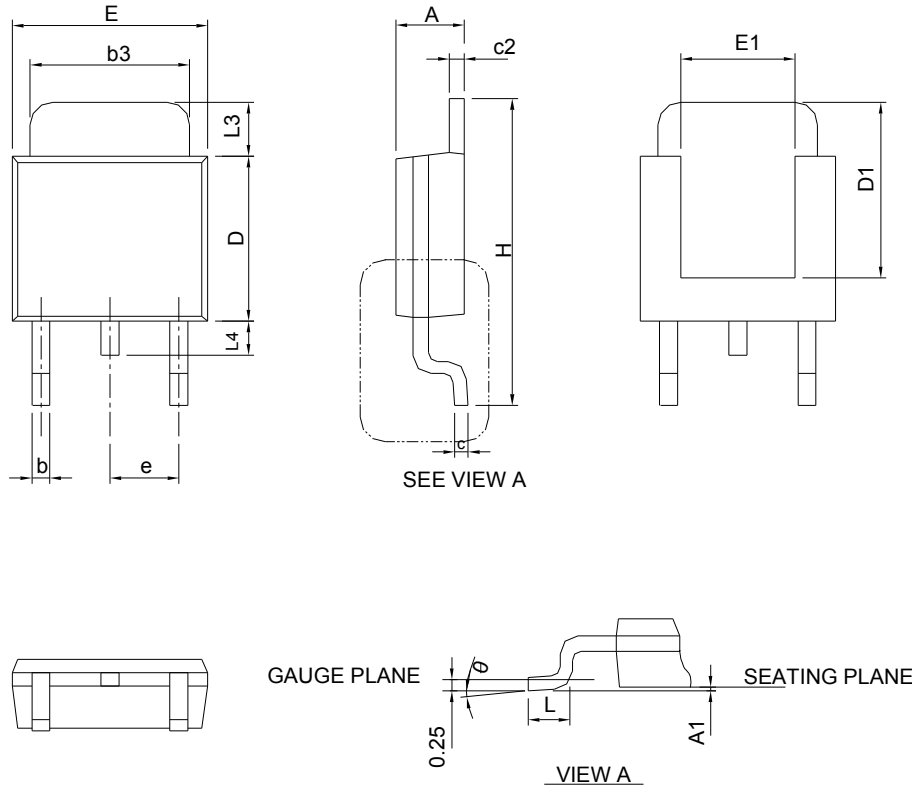


Fig.11 Gate Charge Waveform



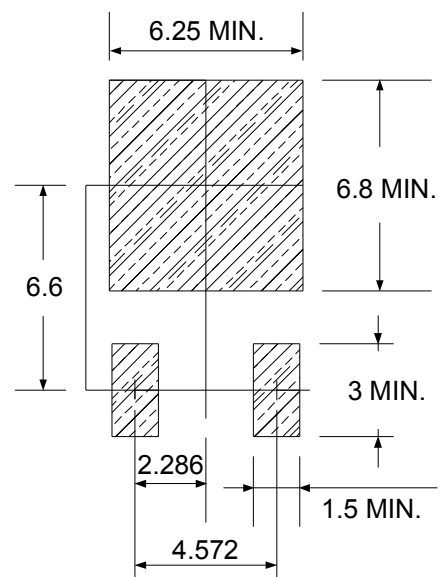
Package Information

TO-252



DIMENSIONS	TO-252			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1		0.13		0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4		1.02		0.040
θ	0°	8°	0°	8°

RECOMMENDED LAND PATTERN



UNIT: mm