P -CHANNEL ENHANCEMENT MODE POWER MOSFET

TF110P04N

● General Description

The TF110P04M 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

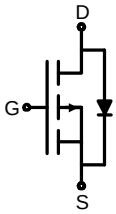
●Application

Load Switches

DC/DC

BLDC Motor driver

● Product Summary

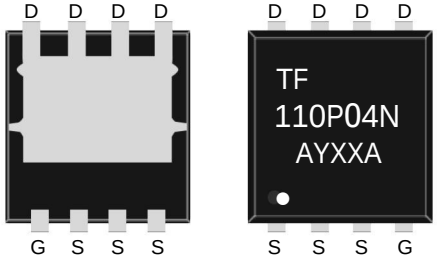


V_{DS} =-40V I_D=-50A

$R_{DSON(-10V\ typ)}$ =11.0mΩ

$R_{DSON(-4.5V\ typ)}$ =14.0mΩ

RoHS compliant



PDFNWB5x6-8L

●Ordering Information:

Part NO.	TF110P04N
Marking1	110P04N
Marking2	TF:tuofeng; Y:year code; XX:Week; AA:device code;
Basic ordering unit (pcs)	5000

●Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	-50	A
	$I_{D@}$TC=75℃	-35	A
	$I_{D@}$TC=100℃	-30	A
Pulsed Drain Current ①	I_{DM}	-150	A
Total Power Dissipation②	P_D@T_A=25℃	45	W
Total Power Dissipation	P_D@T_A=25℃	2.0	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	155	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case②	R_{thJC}	-	-	6.1	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	65	°C/W
Soldering temperature, wave soldering for 8s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =-250uA	- 40			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =-250uA	-1.2	-1.6	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-40V, V_{GS} =0V			-1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A		11.0	14.0	mΩ
		V_{GS}=-4.5V, I_D=-15A		14.0	18.0	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-5A		12		s
Source-drain voltage	VSD	Is=-15A		0.85		V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=-20V f = 1MHz	-	3210	-	pF
Output capacitance	Coss		-	238	-	
Reverse transfer capacitance	Crss		-	226	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} =-20V I_D = -20A V_{GS} = -10V	-	42	-	nC
Gate - Source charge	Qgs		-	7.0	-	
Gate - Drain charge	Qgd		-	8.2	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

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

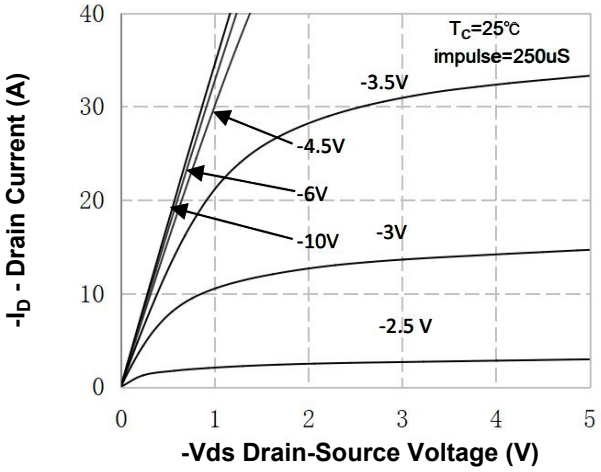


Figure 1. On-Region Characteristics

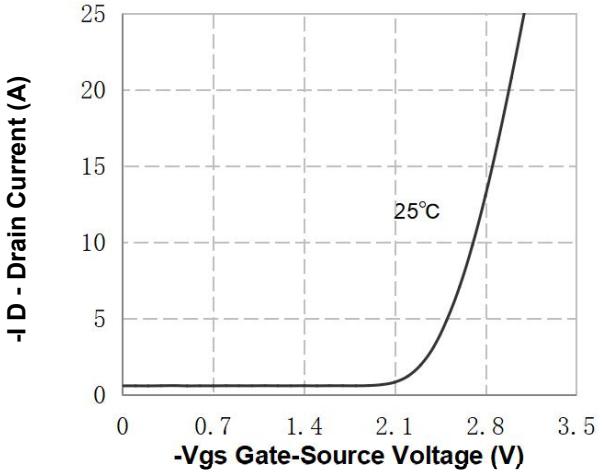


Figure 2. Transfer Characteristics

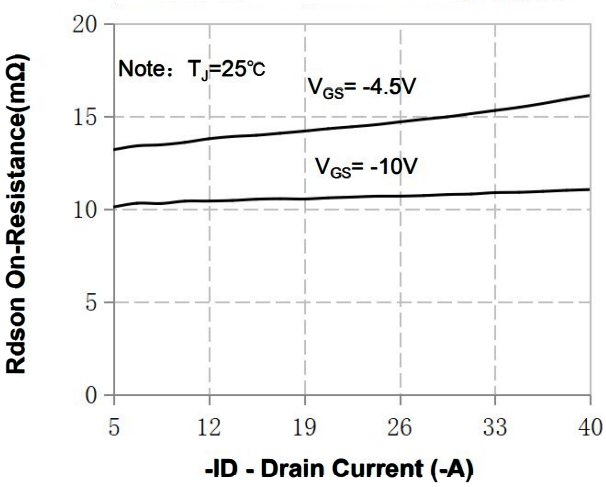


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

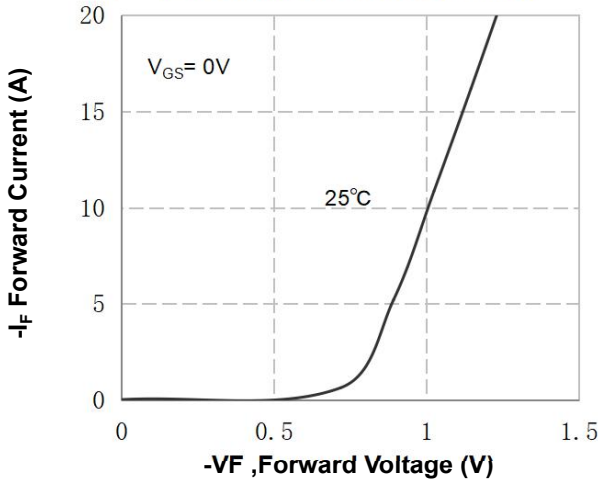


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

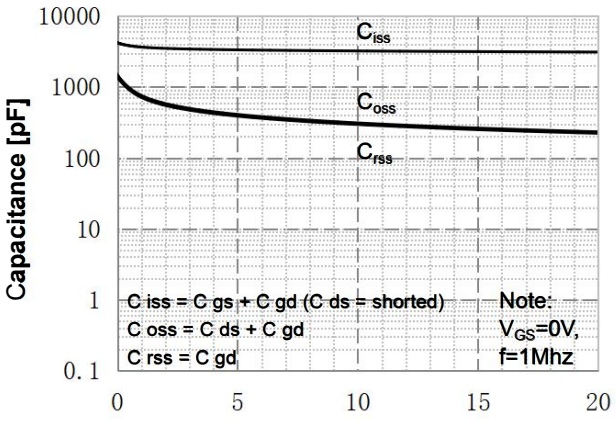


Figure 5. Capacitance Characteristics

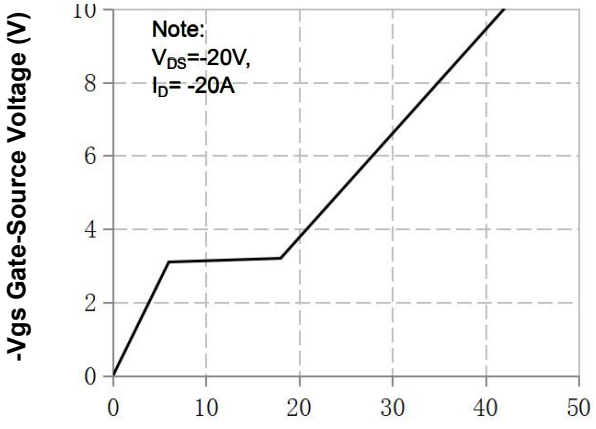


Figure 6. Gate Charge Characteristics

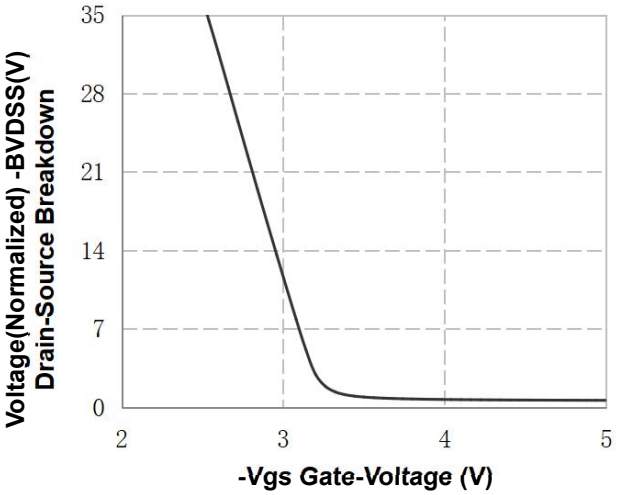


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

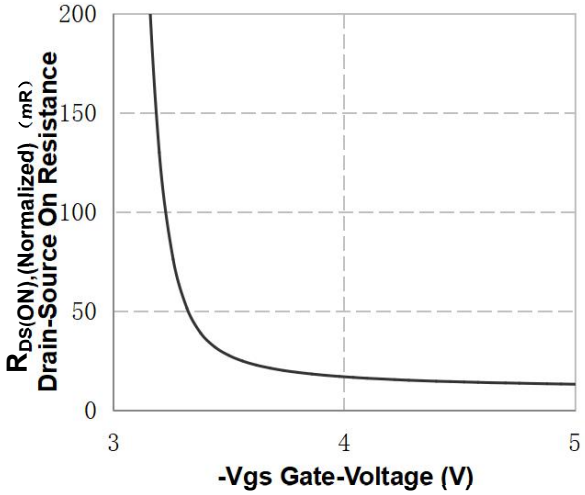


Figure 8. On-Resistance Variation vs Gate Voltage

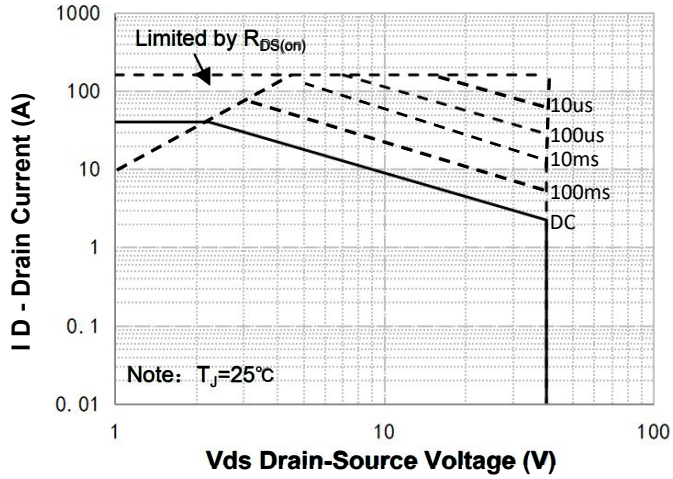


Figure 9. Maximum Safe Operating Area

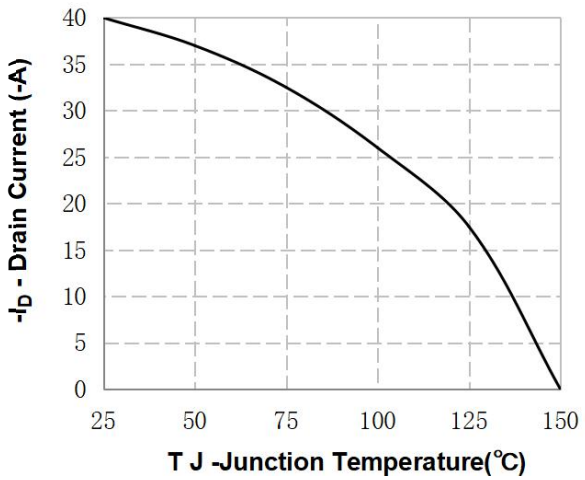


Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

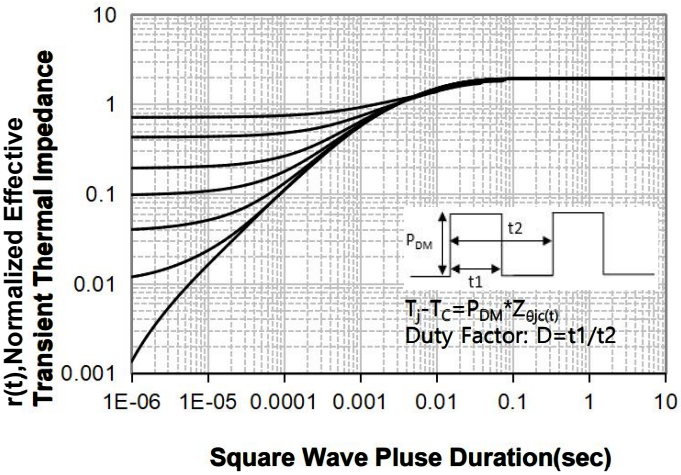
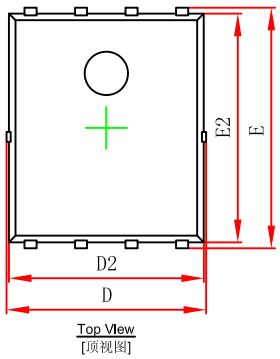
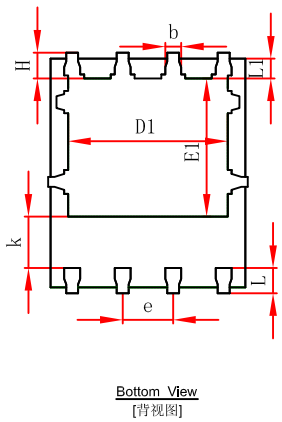
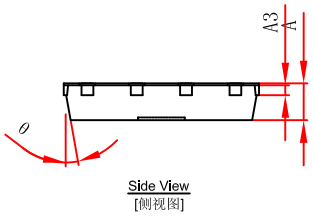


Figure 11. Transient Thermal Response Curve

PDFNWB5x6-8L Package Outline Dimensions

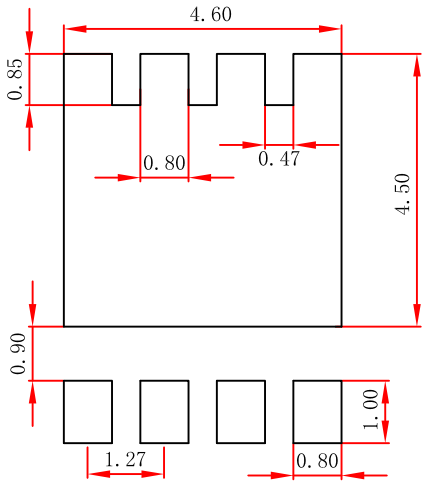






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

PDFNWB5x6-8L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.