

• General Description

The TF150P03M combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

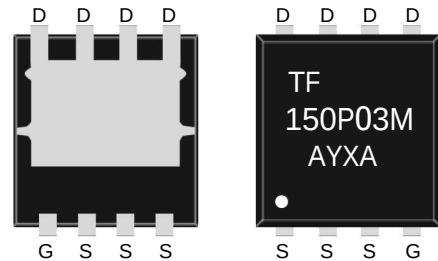
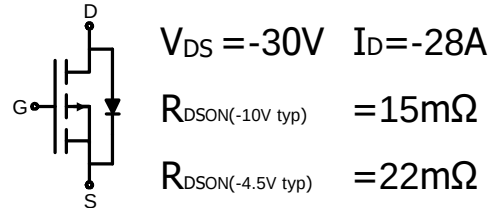
• Features

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

• Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

• Product Summary



PDFNWB3.3x3.3-8L

• Ordering Information:

Part NO.	TF150P03M
Marking 1	TF:tuofeng; 150P03M:TF150P03M
Marking 2	Y:year code; X:Week; AA:device code;
Basic ordering unit (pcs)	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	-25	A
	$I_D @ T_C = 75^\circ C$	-20	A
	$I_D @ T_C = 100^\circ C$	-16	A
Pulsed Drain Current ①	I_{DM}	-85	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	22	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	1.3	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$

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

Single Pulse Avalanche Energy	E _{AS}		26		mJ	
Avalanche Current	I _{AS} I _{AR}		-18		A	
●Thermal resistance						
Parameter		Symbol		Min.	Typ.	Max. Unit
Thermal resistance, junction - case		R _{thJC}		-	-	6.0 ° C/W
Thermal resistance, junction - ambient		R _{thJA}		-	-	60 ° 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	-30			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	-1.0	-1.5	-2.1	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-30V, 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 =-15A		15	18	mΩ
		V _{GS} =-4.5V, I _D =-10A		22	26	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-10A		23.5		S
Source-drain voltage	V _{SD}	I _S =-15A			1.20	V
●Electronic Characteristics						
Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	V _{ds} =-15V,V _{gs} =0V f = 1MHz	-	980	-	pF
Output capacitance	C _{oss}		-	137	-	
Reverse transfer capacitance	C _{rss}		-	113	-	
●Gate Charge characteristics(T _a = 25°C)						
Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Resistance	R _g	f = 1MHz		10		Ω
Total gate charge	Q _g	V _{DD} = - 15V I _D = -10A V _{GS} = -10V	-	20	-	nC
Gate - Source charge	Q _{gs}		-	3.0	-	
Gate - Drain charge	Q _{gd}		-	5.5	-	
Turn-ON Delay time	t _{D(on)}	V _{GS} =-10V ,V _{DS} =-15V R _G =3Ω, I=-10A		7.5		ns
Turn-ON Rise time	t _r			16		ns
Turn-Off Delay time	t _{D(off)}			49		ns
Turn-Off Fall time	t _f			32		ns

Typical Characteristics

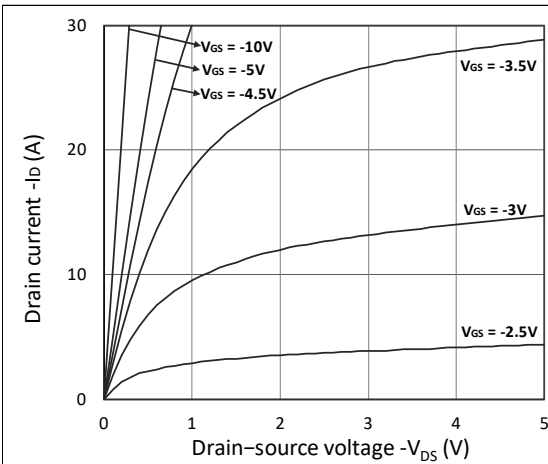


Figure 1. Output Characteristics

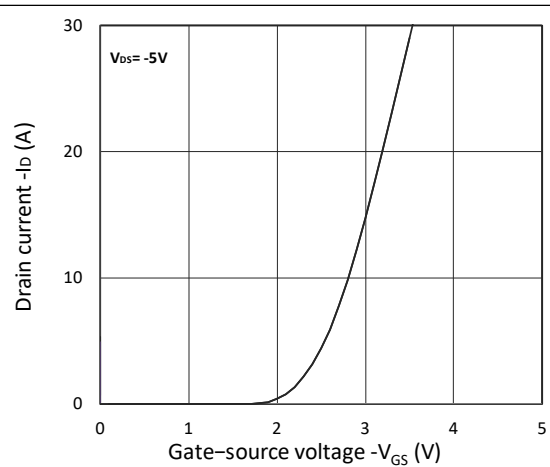


Figure 2. Transfer Characteristics

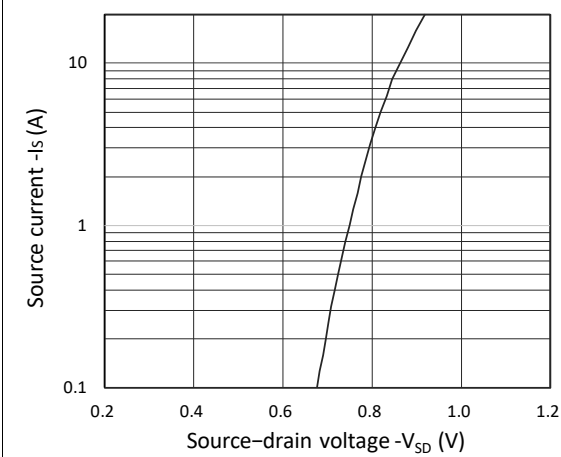


Figure 3. Forward Characteristics of Reverse

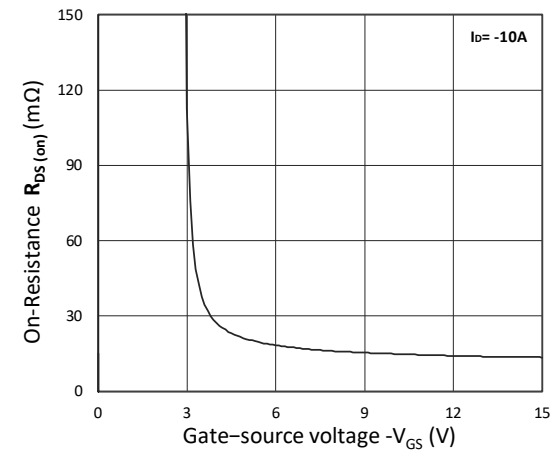


Figure 4. $R_{DS(on)}$ vs. V_{GS}

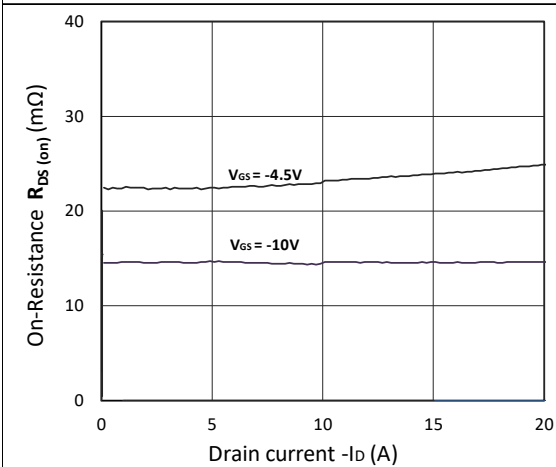


Figure 5. $R_{DS(on)}$ vs. I_D

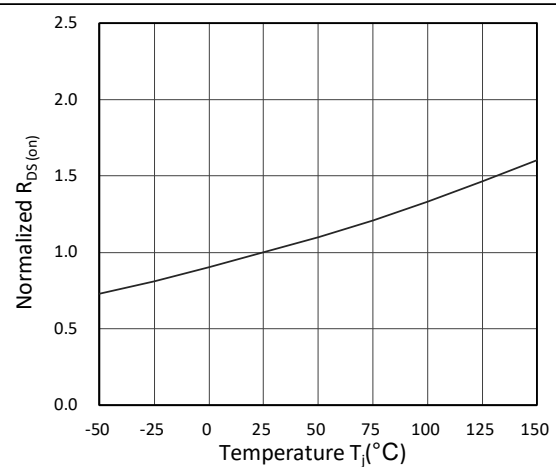


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

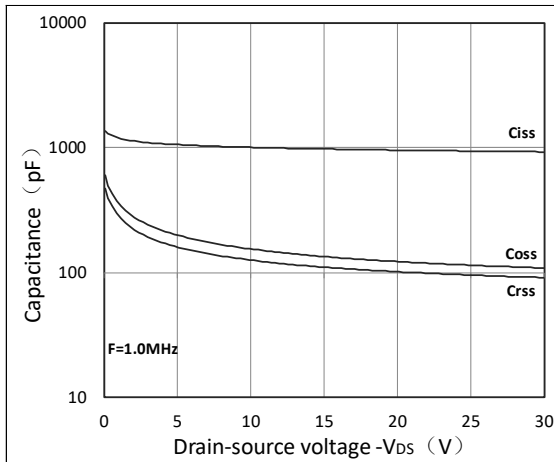


Figure 7. Capacitance Characteristics

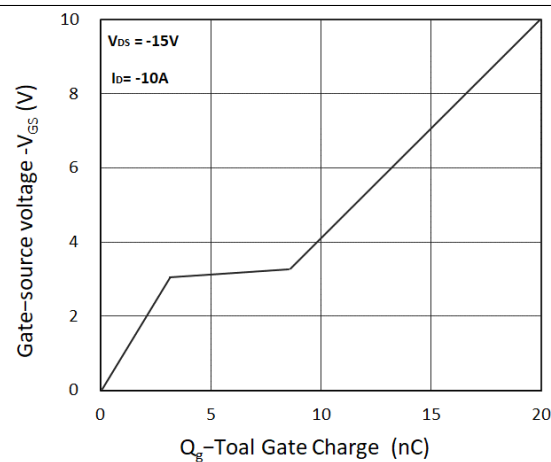


Figure 8. Gate Charge Characteristics

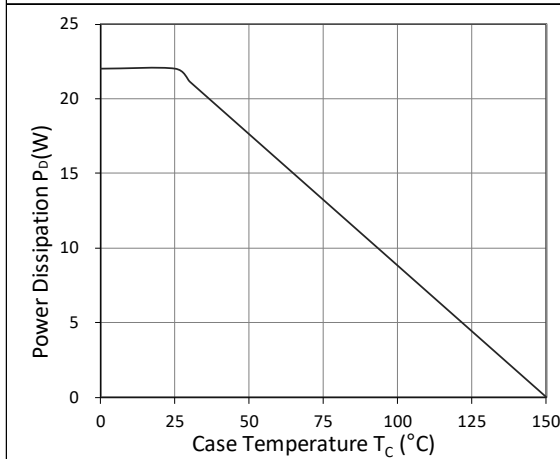


Figure 9. Power Dissipation

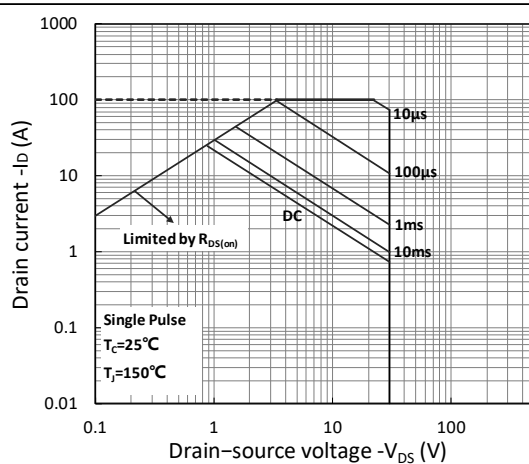


Figure 10. Safe Operating Area

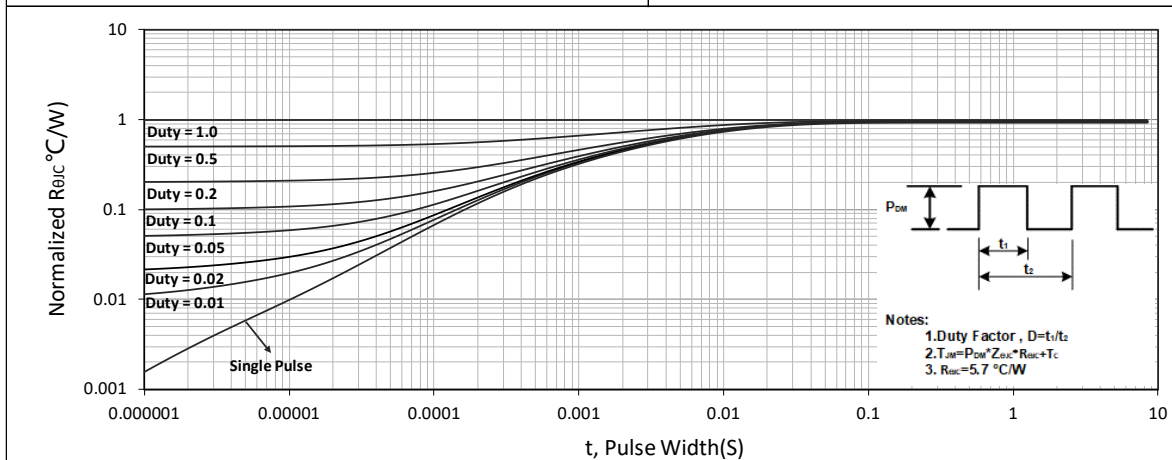


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

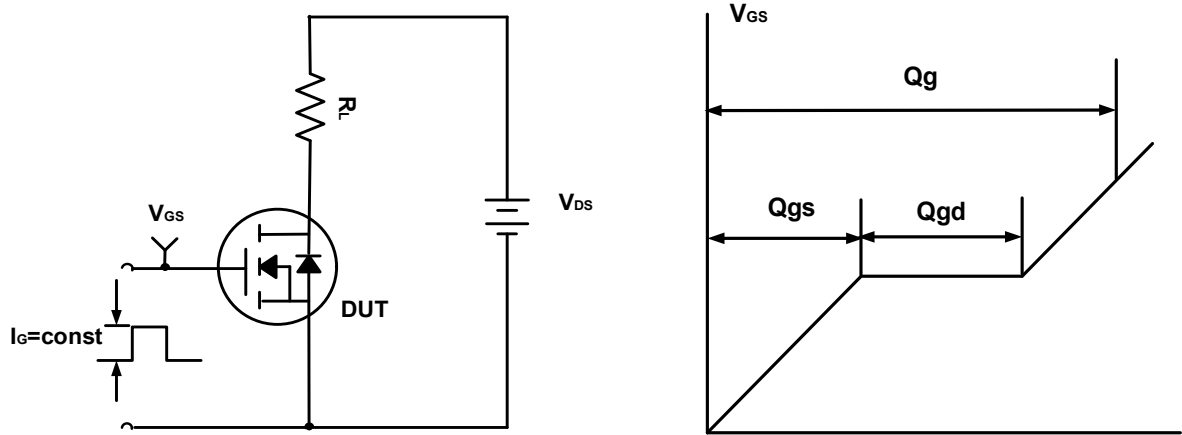


Figure A. Gate Charge Test Circuit & Waveforms

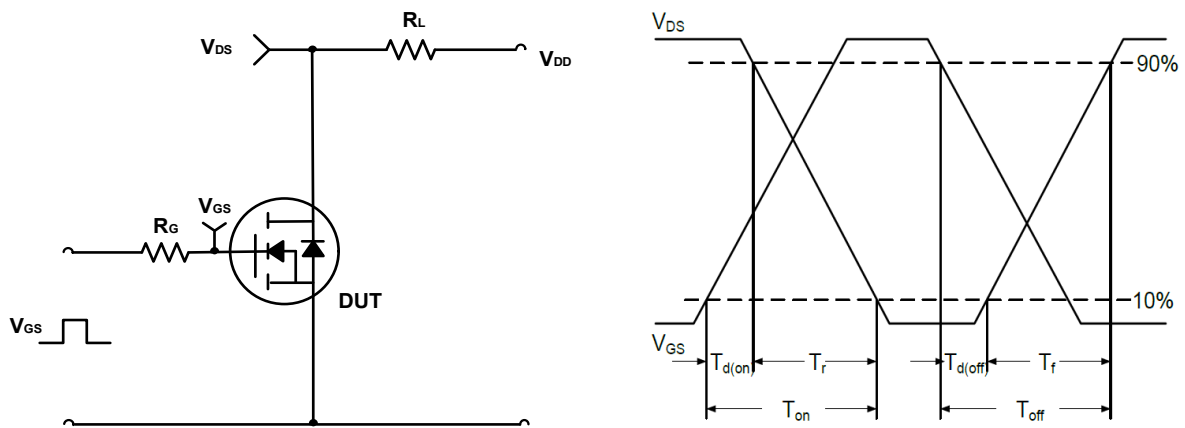


Figure B. Switching Test Circuit & Waveforms

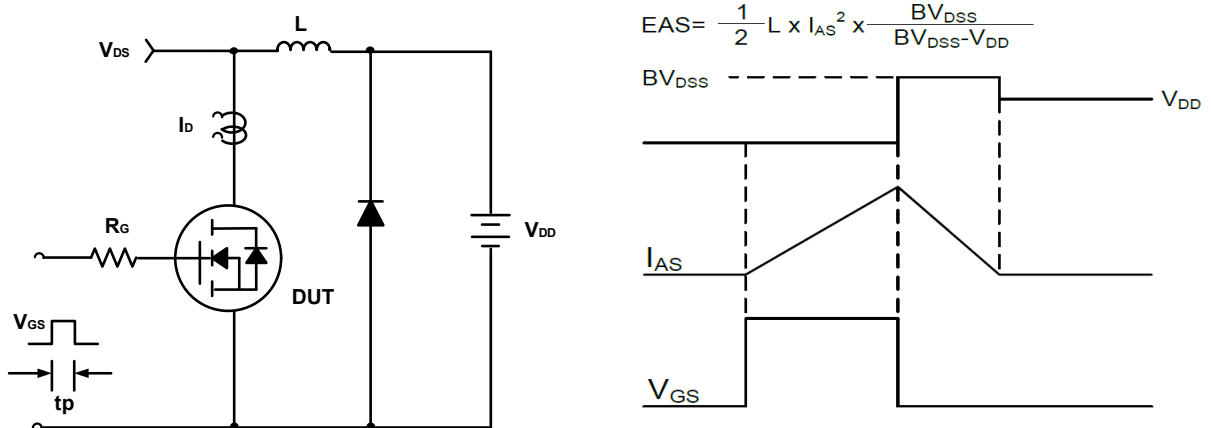
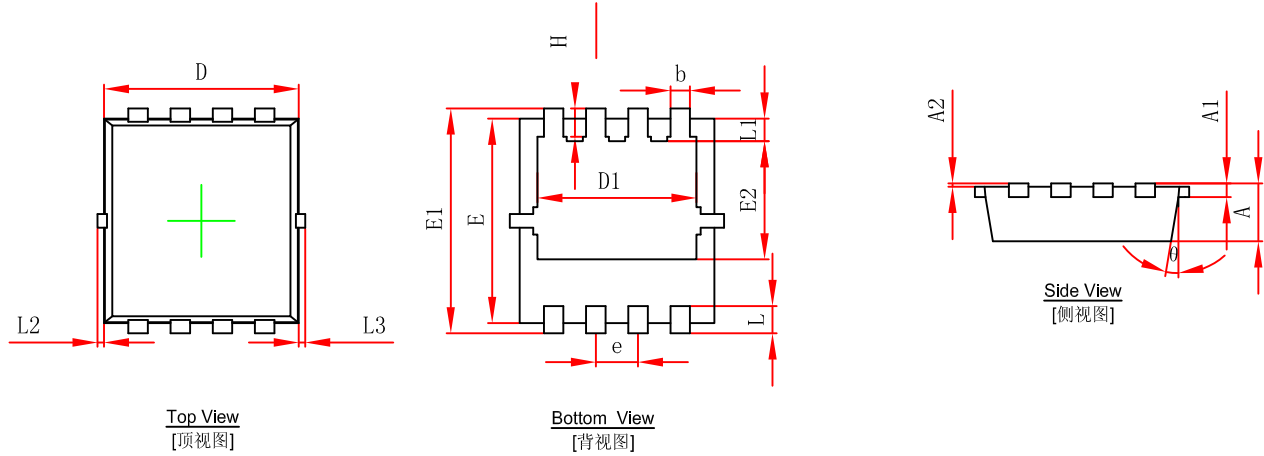


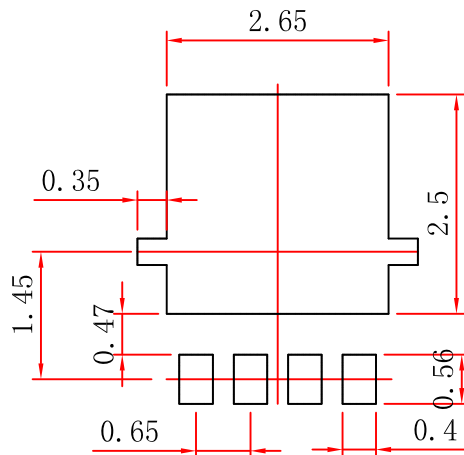
Figure C. Unclamped Inductive Switching Circuit & Waveforms

PDFNWB3.3x3.3-8L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

PDFNWB3.3x3.3-8L Suggested Pad Layout



Note:

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