

Description

The TFD230P03M uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

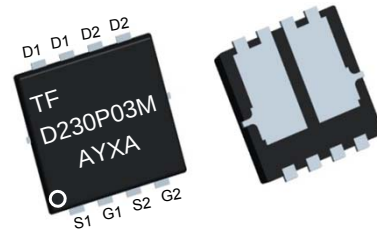
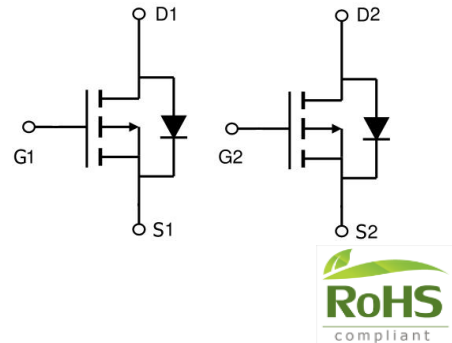
General Features

- $V_{DS} = -30V$, $I_D = -9A$
- $R_{DS(ON)} = 25m\Omega$ @ $V_{GS} = -10V$
- $R_{DS(ON)} = 35m\Omega$ @ $V_{GS} = -4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

Schematic diagram



PDFNWB3.3x3.3-8L

Ordering Information:

Part NO.	TFD230P03M
Marking1	TFD230P03M
Marking2	TF:tuofeng; Y:year code; XX: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	$I_{D@T_C=25^\circ C}$	-9.0	A
	$I_{D@T_C=75^\circ C}$	-6.0	A
	$I_{D@T_C=100^\circ C}$	-5.0	A
Pulsed Drain Current ^①	I_{DM}	-30	A
Total Power Dissipation ^②	$P_D@T_C=25^\circ C$	15	W
Total Power Dissipation	$P_D@T_A=25^\circ C$	1.5	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R _{thJC}	-	-	7.5	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	65	° C/W
Soldering temperature, wavesoldering for 8s	T _{sold}	-	-	265	° C

•Electronic Characteristics(T_j=25°C,unless otherwise notse)

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	-2.0	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-28V, 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 =-8.0A		25	30	mΩ
		V _{GS} =-4.5V, I _D =-5.0A		35	40	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-8.0A		15		S
Source-drain voltage	V _{SD}	I _S =-8.0A		0.85	1.00	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz V _{DD} = -15V V _{GS} = 0V	-	918	-	pF
Output capacitance	C _{oss}		-	168	-	
Reverse transfer capacitance	C _{rss}		-	69.6	-	

•Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = -15V I _D = -8.0A V _{GS} = -10V	-	18.9	-	nC
Gate - Source charge	Q _{gs}		-	3.17	-	
Gate - Drain charge	Q _{gd}		-	4.56	-	
Body Diode Reverse Recovery Time	T _{rr}	I _F =10A, di/dt=100A/μs		11		nS
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =10A, di/dt=100A/μs		23		nC

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;

Fig.1 Gate-Charge Characteristics

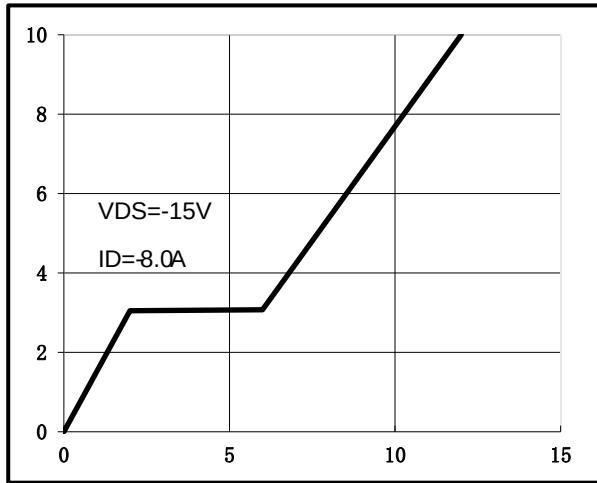


Fig.2 Capacitance Characteristics

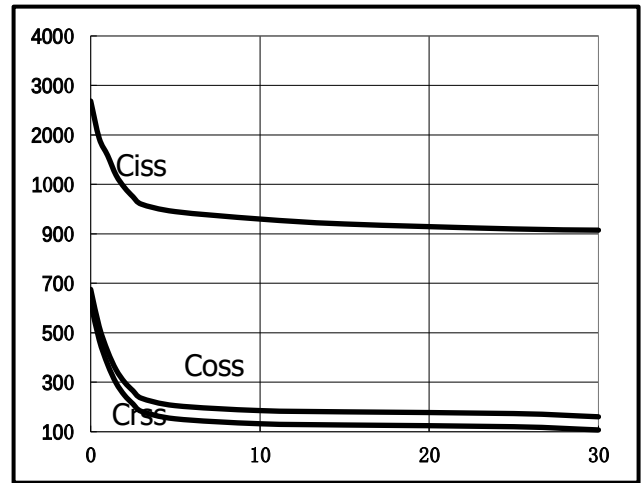


Fig.3 Power Dissipation Derating Curve

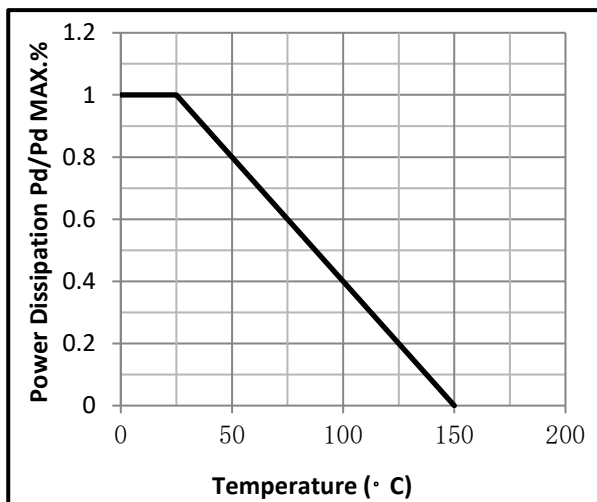


Fig.4 Typical output Characteristics

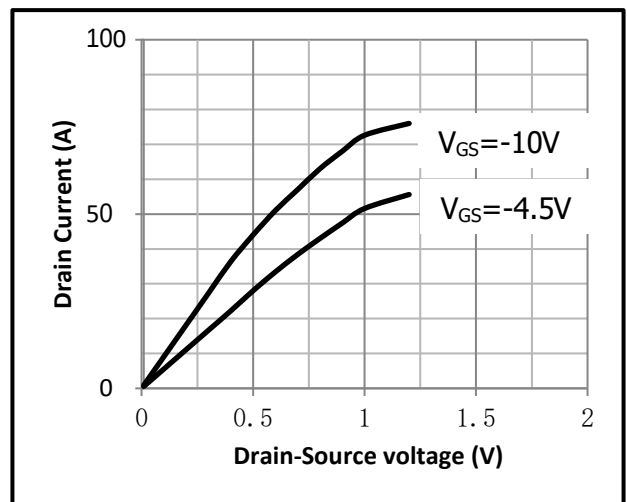


Fig.5 Threshold Voltage V.S Junction Temperature

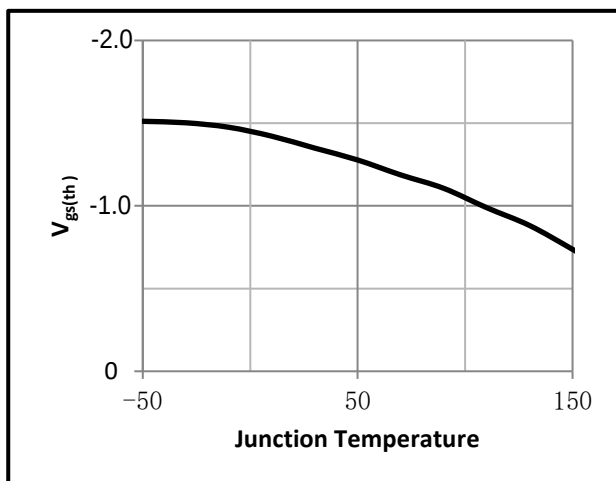


Fig.6 Resistance V.S Drain Current

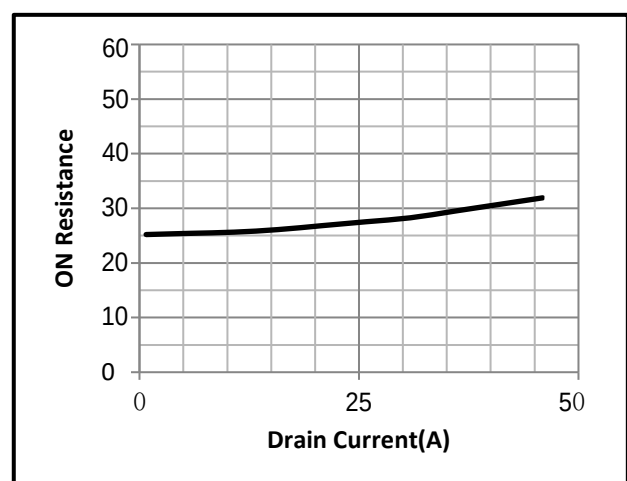


Fig.7 On-Resistance VS Gate Source Voltage

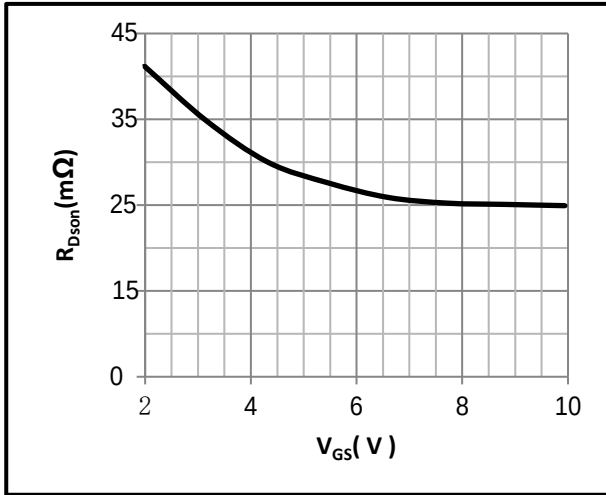


Fig.8 On-Resistance V.S Junction Temperature

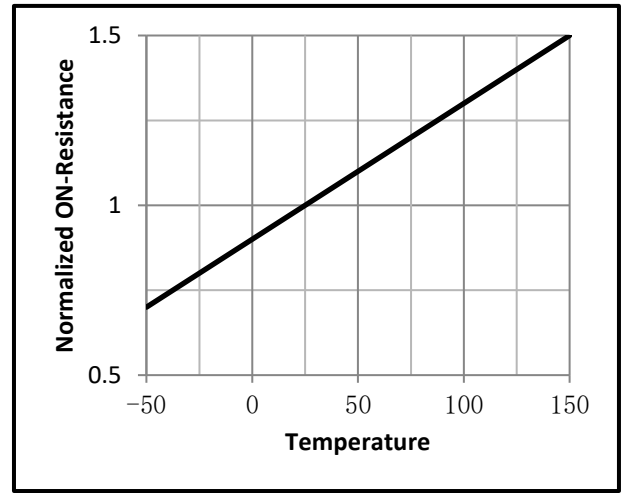


Fig.9 Switching Time Measurement Circuit

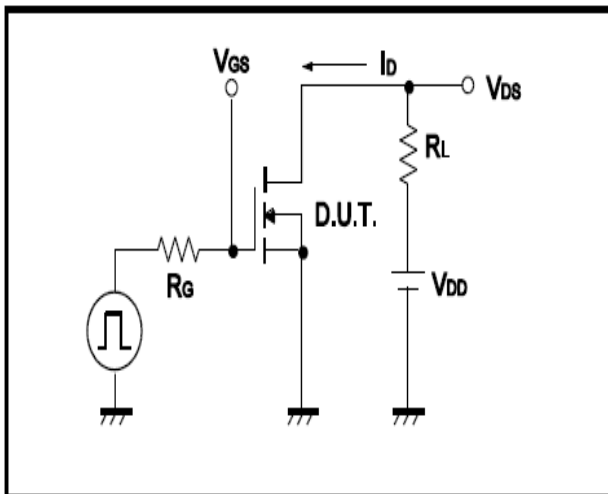


Fig.10 Gate Charge Waveform

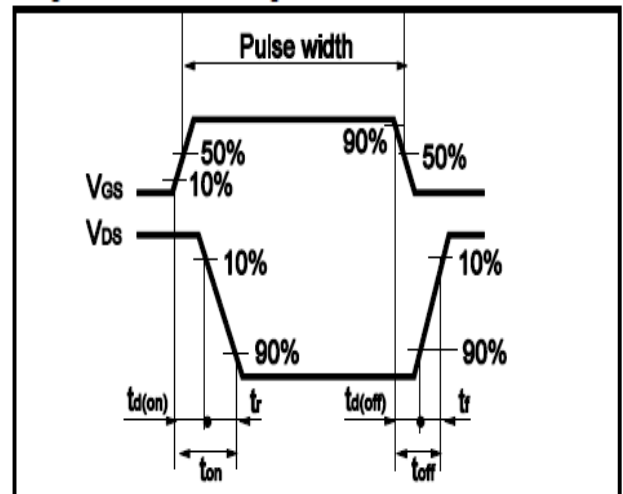


Fig.11 Avalanche Measurement Circuit

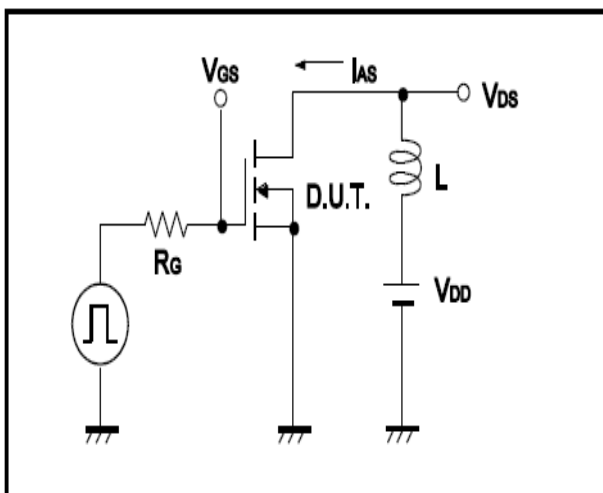
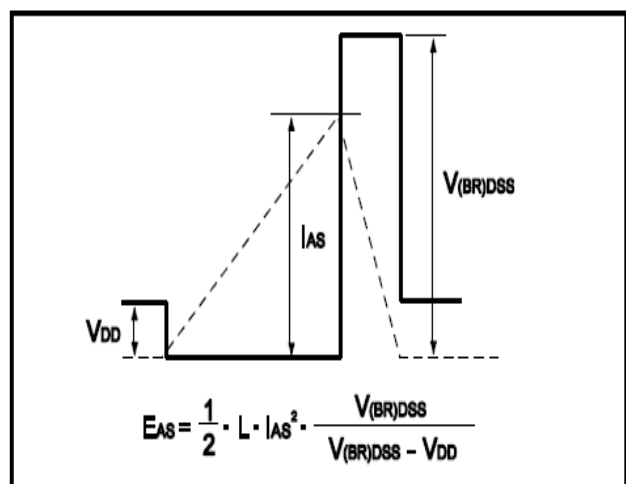
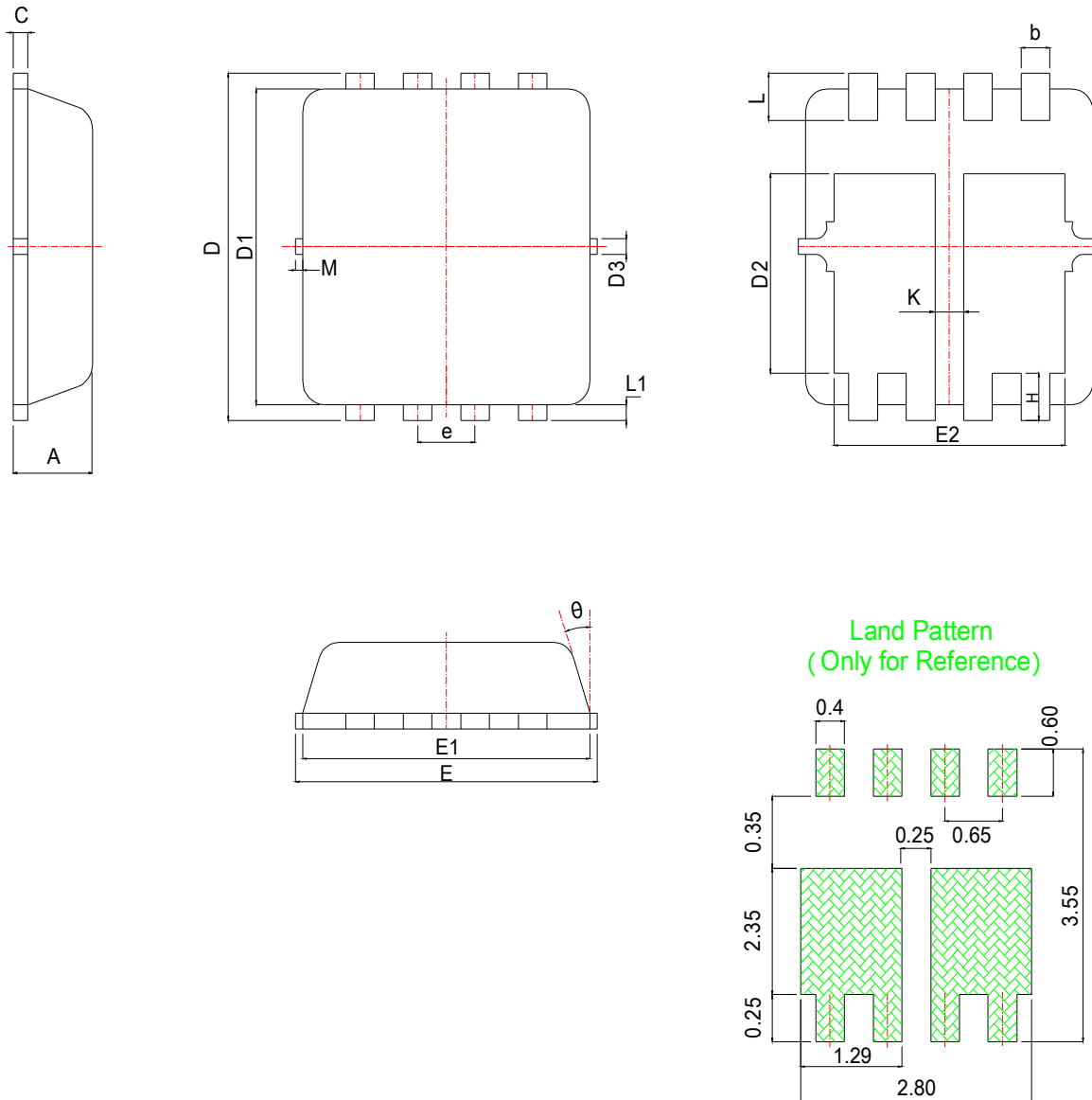


Fig.12 Avalanche Waveform



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



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	θ	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006
K	0.30	*	*	0.012	*	*							