N-CHANNEL ENHANCEMENT MODE POWER MOSFET

TFD180N06N

● General Description

The TFD180N06N combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON). This device is ideal for load switch and battery protection applications.

● Features

Advance high cell density Trench technology

Low RDS(ON) to minimize conductive loss

Low Gate Charge for fast switching

Dual DIE in one package

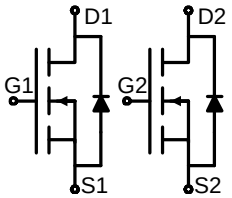
●Application

Power Management in Notebook Computer,

Portable Equipment and Battery

Powered Systems

● Product Summary

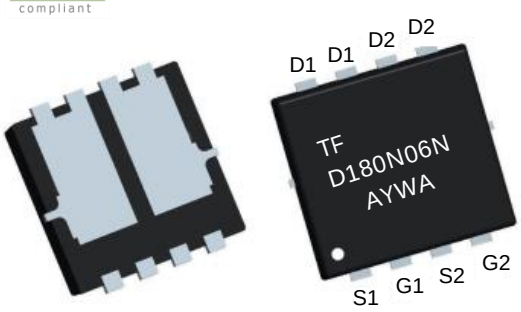


V_{DS} =60V I_D=25A

$R_{DSON(10V\ typ)}$ =17mΩ

$R_{DSON(4.5V\ typ)}$ =23mΩ

RoHS compliant



PDFNWB5x6-8L

●Package Marking and Ordering Information:

Part NO.	TFD180N06N
Marking1	D180N06N
Marking2	TF:tuofeng; AA:device code; Y:year code; X:Week
Basic ordering unit	5000 / PCS

●Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	25	A
	$I_{D@}$TC=75℃	18	A
	$I_{D@}$TC=100℃	15	A
Pulsed Drain Current ①	I_{DM}	70	A
Total Power Dissipation	P_D@TC=25℃	40	W
Total Power Dissipation	P_D@TA=25℃	1.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	80	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	8.5	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	75	°C/W
Soldering temperature, wavesoldering for 8 s	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	60	-	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.2	1.5	2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60 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	-	17	20	mΩ
		V_{GS}=4.5V, I_D=15A	-	23	26	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A	-	10	-	S
Source-drain voltage	V_{SD}	Is=10A	-	-	1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=30V V_{GS}=0V	-	1000	-	pF
Output capacitance	Coss		-	108	-	
Reverse transfer capacitance	Crss		-	96.9	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} = 30V I_D = 15A V_{GS} = 10V	-	15.0	-	nC
Gate - Source charge	Qgs		-	4.5	-	
Gate - Drain charge	Qgd		-	7.5	-	

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

Fig.1 Power Dissipation

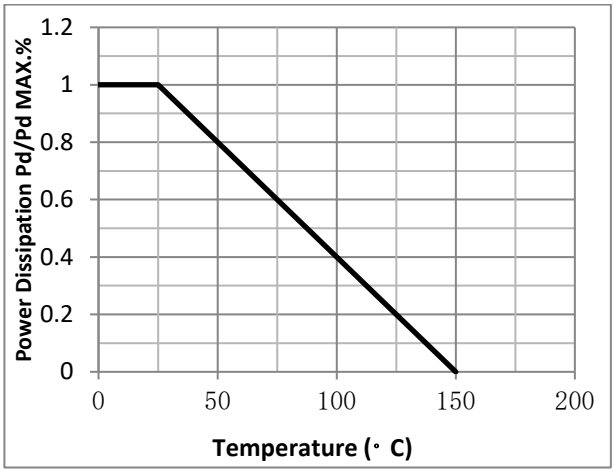


Fig.2 Typical output Characteristics

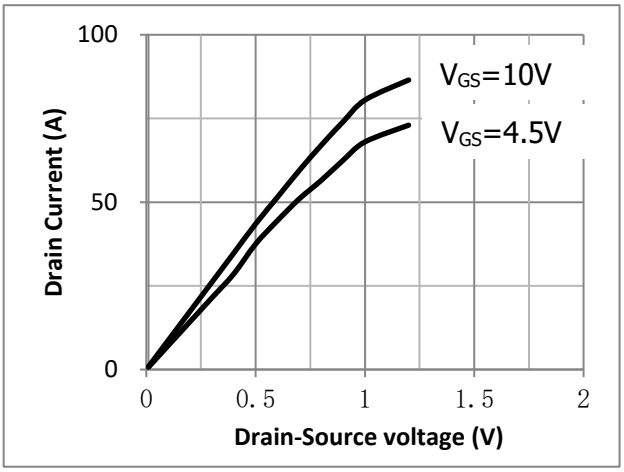


Fig.3 Threshold Voltage V.S Junction Temperature

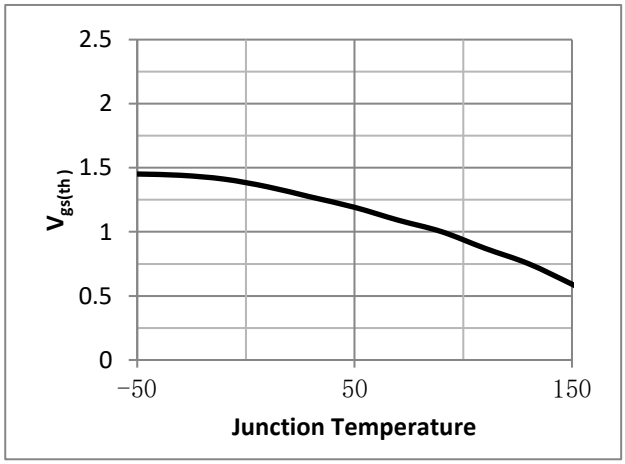


Fig.4 Resistance V.S Drain Current

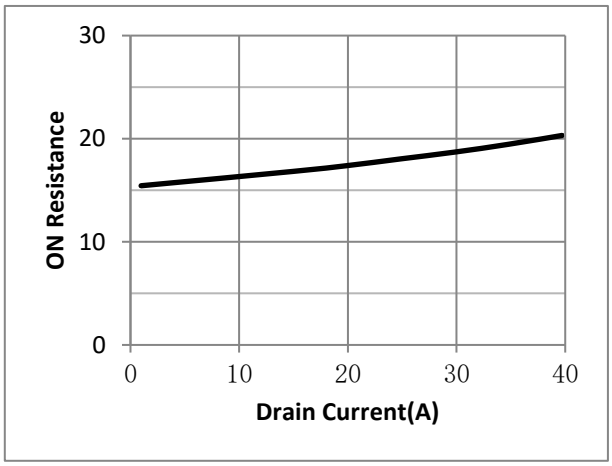


Fig.5 On-Resistance VS Gate Source Voltage

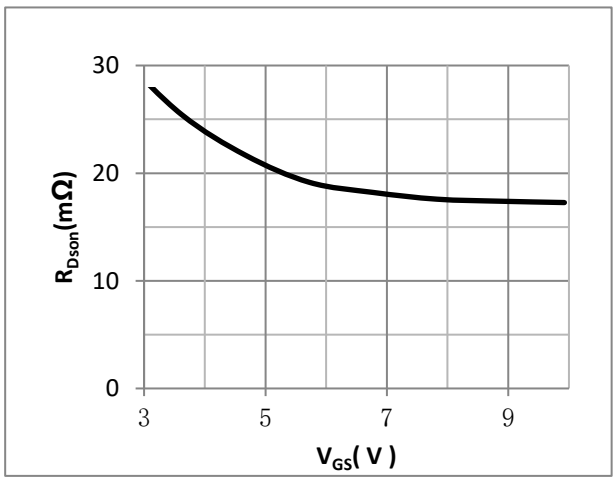


Fig.6 On-Resistance V.S Junction Temperature

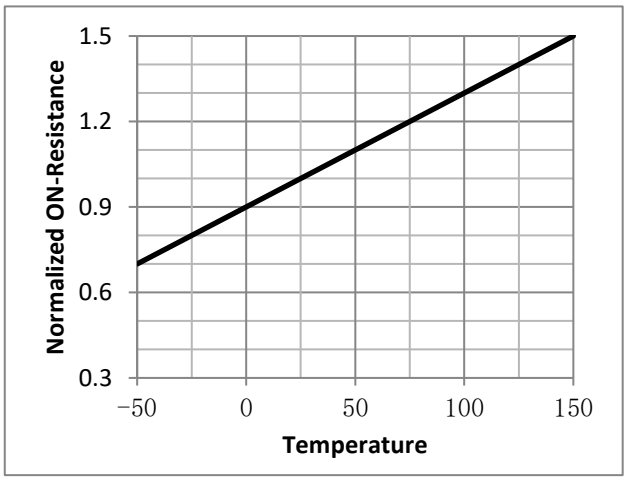


Fig.7 Switching Time Measurement Circuit

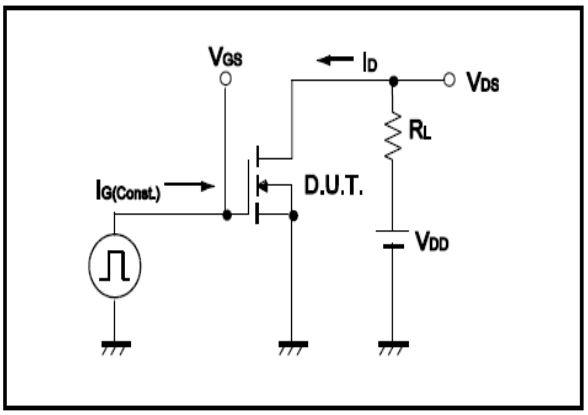


Fig.8 Gate Charge Waveform

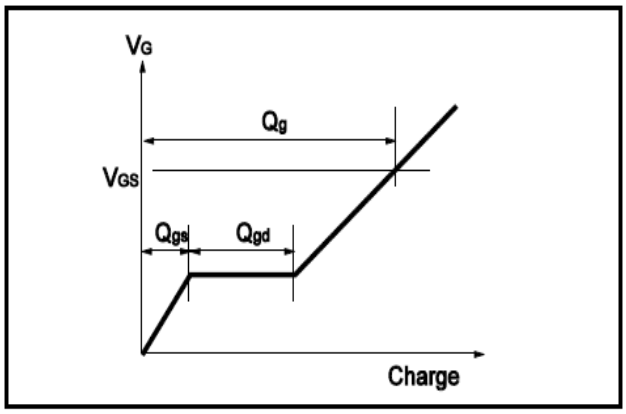


Fig.9 Switching Time Measurement Circuit

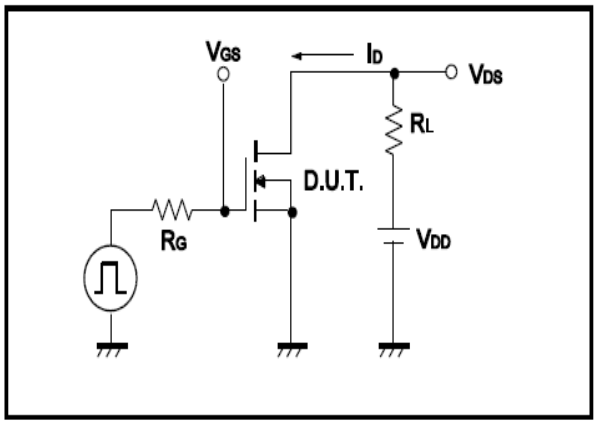


Fig.10 Gate Charge Waveform

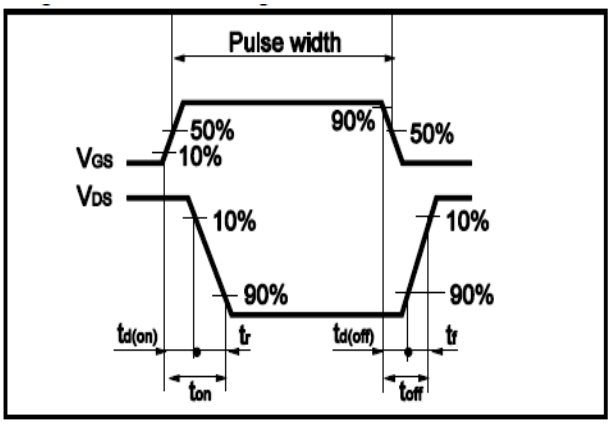


Fig.11 Avalanche Measurement Circuit

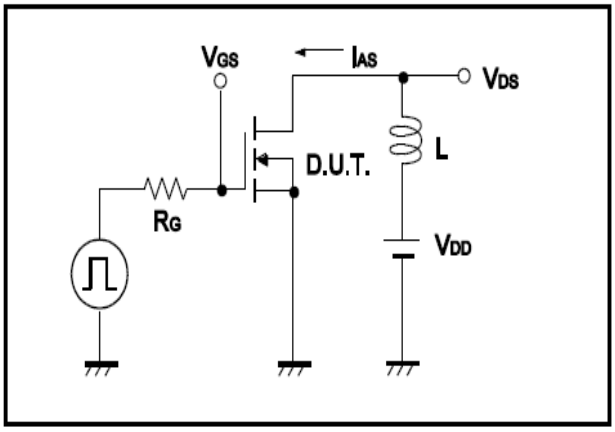
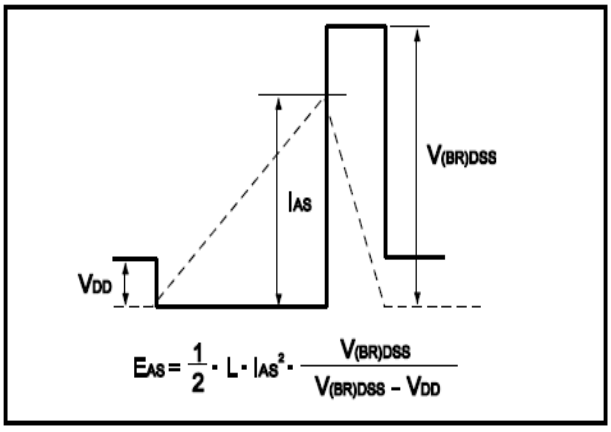
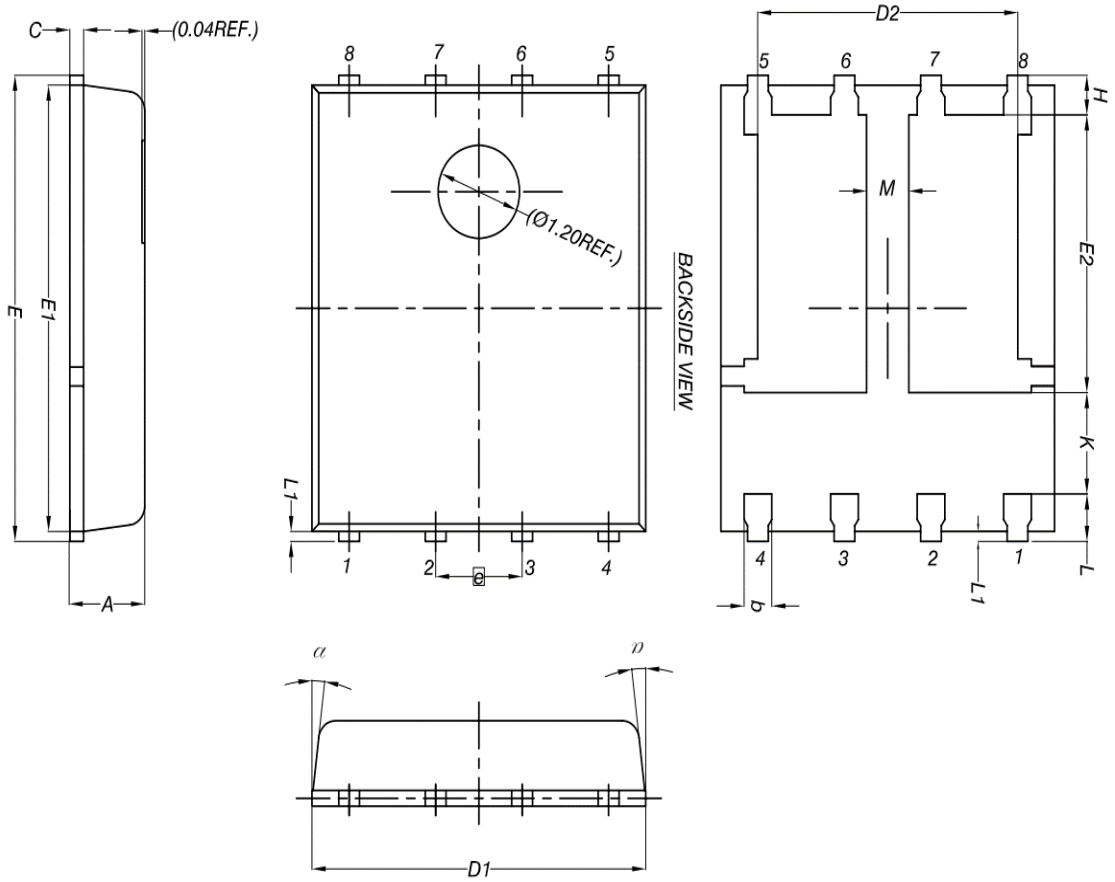


Fig.12 Avalanche Waveform



PDFNWB5x6-8L Package Outline Dimensions



Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.9	1	1.1
b	0.33	0.41	0.51
C	0.2	0.25	0.3
D1	4.8	4.9	5
D2	3.61	3.81	3.96
E	5.9	6	6.1
E1	5.7	5.75	5.8
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.1	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.2
M	0.5	--	--
α	0°	--	12°

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