N-CHANNEL ENHANCEMENT MODE POWER MOSFET

TFD080N04N

● General Description

The TFD080N04N 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

Dual DIE in one package

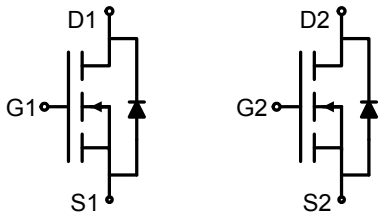
RoHS compliant

● Product Summary

V_{DS}=40V , I_D=40A

$R_{DS(ON)TYP}$ =8.0mΩ @ V_{GS} =10V

$R_{DS(ON)TYP}$ =12mΩ @ V_{GS} =4.5V

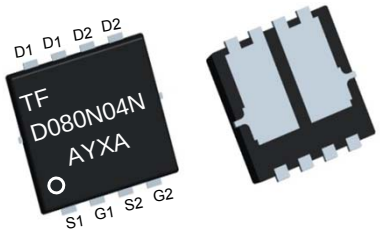


Schematic diagram

●Application

Power Management in Notebook Computer,

Portable Equipment and Battery Powered Systems



PDFN5x6-8L

●Ordering Information:

Part NO.	TFD080N04N
Marking1	D080N04N
Marking2	TF:tuofeng; Y:year code; X: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℃	40	A
	$I_{D@}$TC=75℃	28	A
	$I_{D@}$TC=100℃	24	A
Pulsed Drain Current ①	I_{DM}	100	A
Total Power Dissipation	P_D@TC=25℃	60	W
Total Power Dissipation	P_D@TA=25℃	1.8	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	66	mJ

Avalanche Current	I_{AS} I_{AR}	23	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	3.5	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	60	°C/W
Soldering temperature, wavesoldering 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	1.5	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		8.0	9.5	mΩ
		V_{GS}=4.5V, I_D=15A		12	15	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		10		s

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz	-	1235	-	pF
Output capacitance	Coss		-	152.5	-	
Reverse transfer capacitance	Crss		-	138.5	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} = 20V	-	25.5	-	nC
Gate - Source charge	Qgs	I_D = 20A	-	3.20	-	
Gate - Drain charge	Qgd	V_{GS} = 10V	-	6.50	-	

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

Fig.1 Power Dissipation

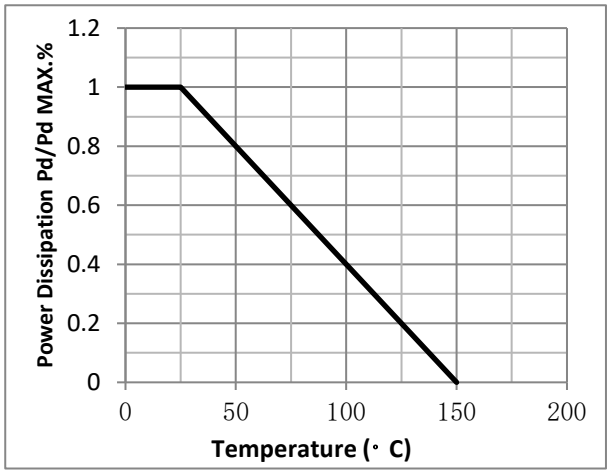


Fig.2 Typical output Characteristics

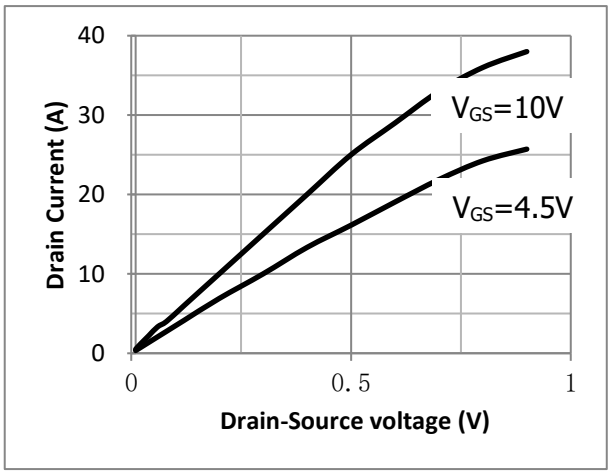


Fig.3 Threshold Voltage V.S Junction Temperature

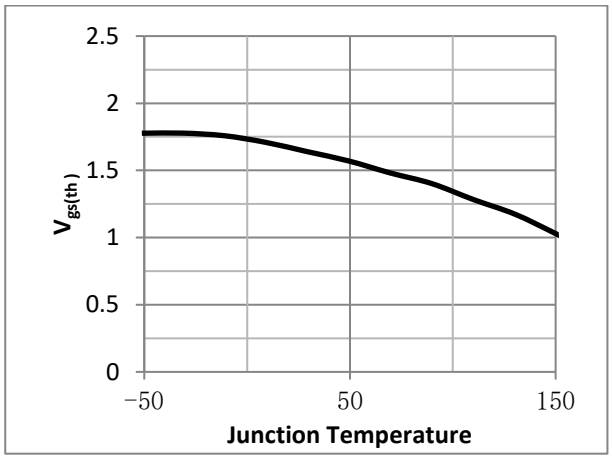


Fig.4 Resistance V.S Drain Current

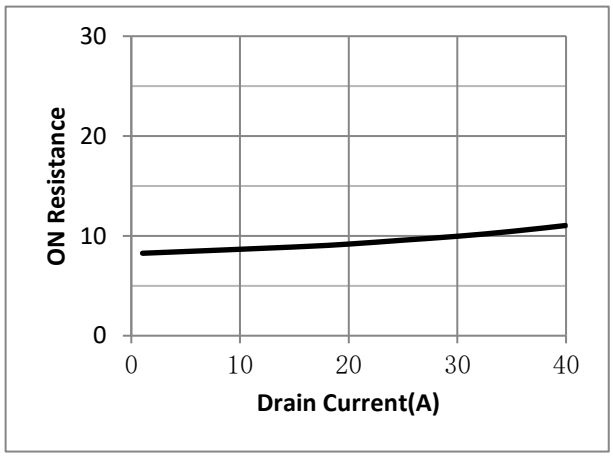


Fig.5 On-Resistance VS Gate Source Voltage

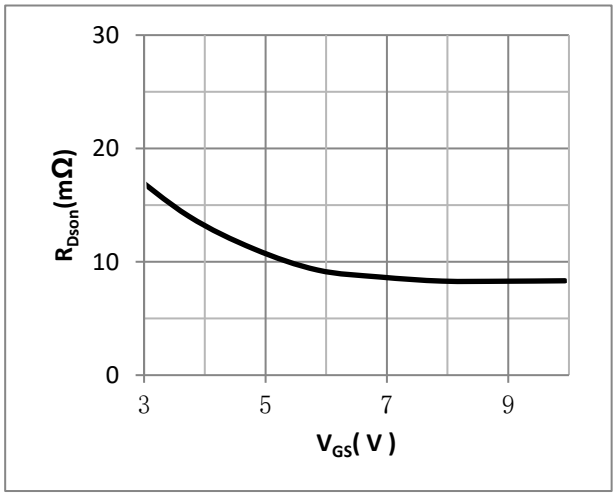


Fig.6 On-Resistance V.S Junction Temperature

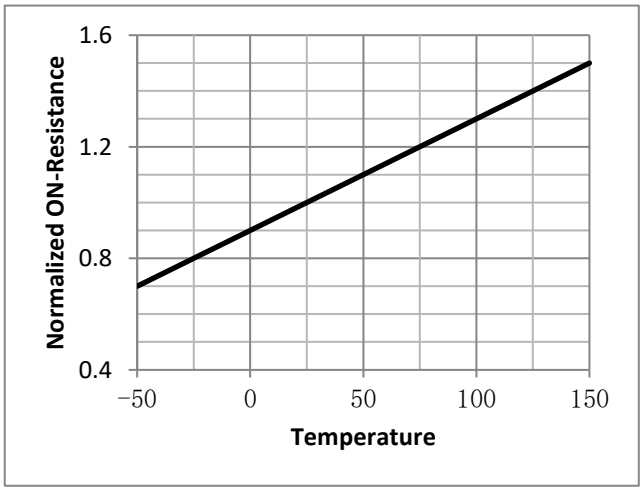


Fig.7 Switching Time Measurement Circuit

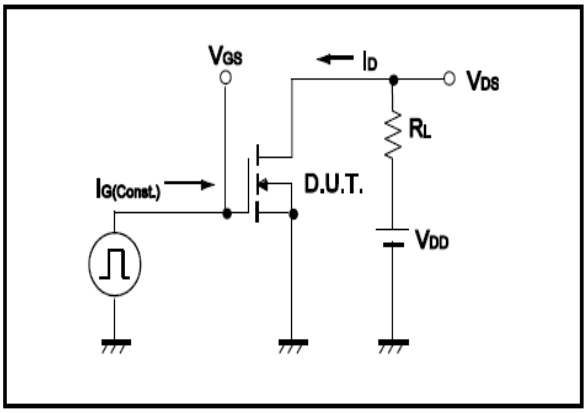


Fig.8 Gate Charge Waveform

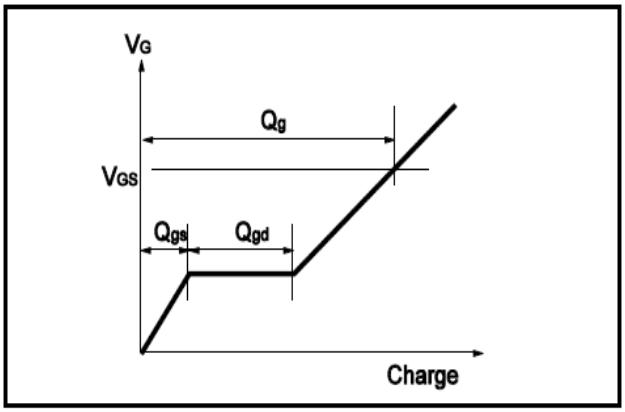


Fig.9 Switching Time Measurement Circuit

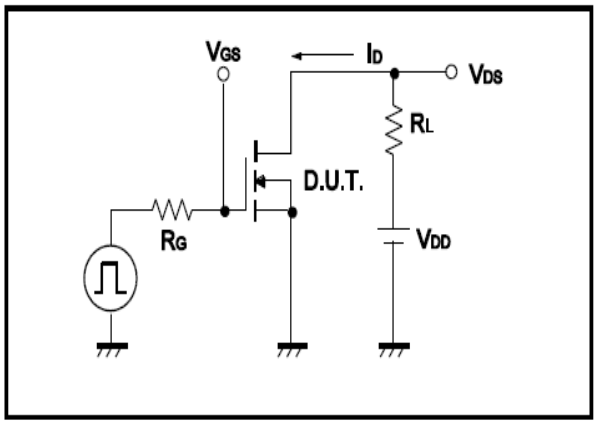


Fig.10 Gate Charge Waveform

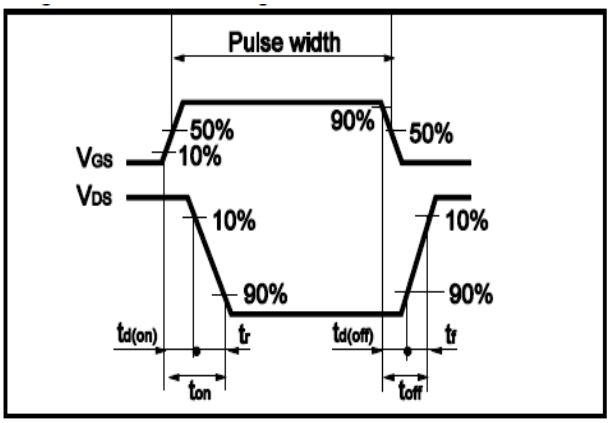


Fig.11 Avalanche Measurement Circuit

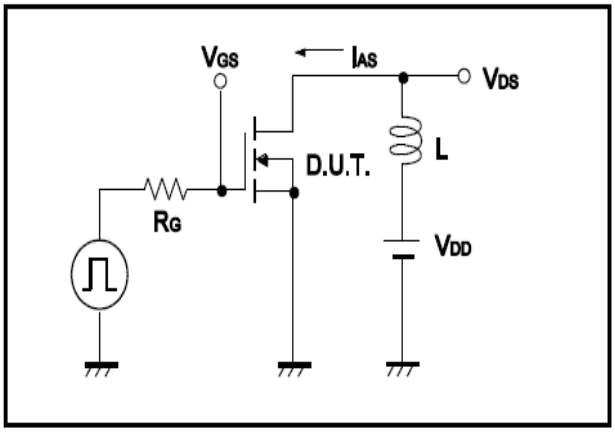
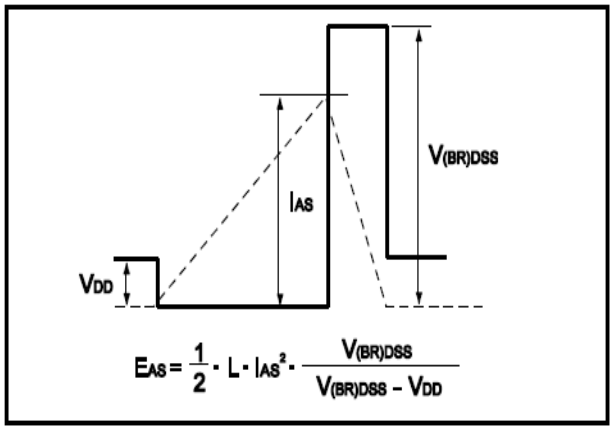
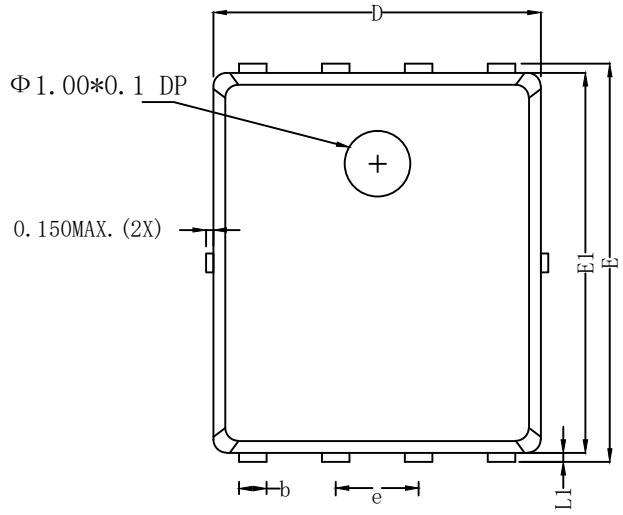
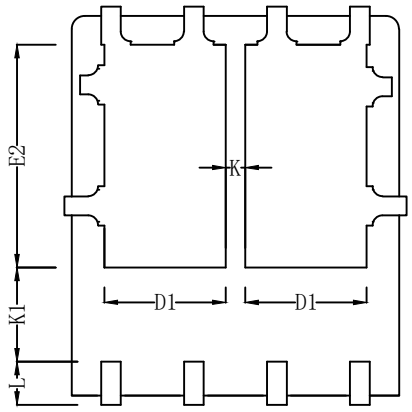


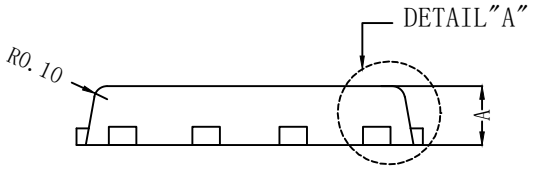
Fig.12 Avalanche Waveform

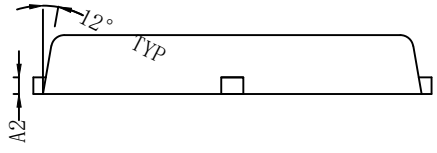


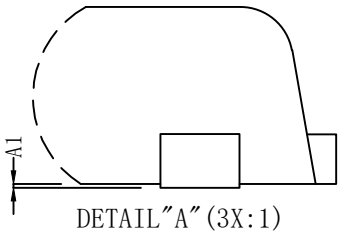
PDFN5x6-8L Package Outline Dimensions











DimensionsInMillimeterer			
Symbol	MIN	TYP	MAX
A	0.90	1.00	1.10
A1	0.00	0.03	0.05
A2	0.254REF		
b	0.25	0.30	0.35
D	4.80	4.90	5.00
D1	1.60	1.70	1.80
E	5.90	6.00	6.10
E1	5.65	5.75	5.85
E2	3.38	3.48	3.58
e	1.27BSC		
K	0.55	0.60	0.65
K1	1.35REF		
L	0.55	0.60	0.65
L1	0.10	0.13	0.16