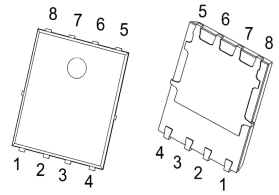
PDFNWB5×6-8L Plastic-Encapsulate MOSFETS

AC130SN04L N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$TYP	I_D
40 V	2.0mΩ@10V	130A

PDFNWB5×6-8L



DESCRIPTION

These N-Channel enhancement mode power field effect transistors are using SGT technology.This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency fast switching applications.

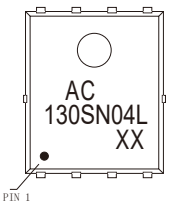
FEATURES

- Battery switch
- Load switch
- High density cell design for ultra low $R_{DS(ON)}$
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

APPLICATIONS

- Networking
- Load Switch
- LED applications

MARKING

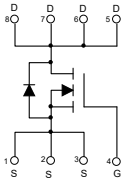


AC130SN04L = Part No.

Solid dot=Pin1 indicator.

XX=Code.

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D ①	130	A
Continuous Drain Current (T_C=100℃)	I_D	90	A
Pulsed Drain Current	I_{DM} ②	390	A
Single Pulsed Avalanche Energy	E_{AS} ③	300	mJ
Power Dissipation	P_D ①	120	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑥	62.5	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$ ①	1.04	℃/W
Operating Junction and Storage Temperature Range	T_J ,T_{stg}	-55~+150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA		40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =32V, V_{GS} =0V	T_J =25℃			1.0	μA
			T_J =125℃			100	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V				±100	nA
On characteristics ④							
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA		1.0	1.5	2.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A			2.0	2.4	mΩ
	$R_{DS(on)}$	V_{GS} =4.5V, I_D =20A			2.9	3.7	mΩ
Forward transconductance	g_{FS}	V_{DS} =5V, I_D =20A			43		S
Dynamic characteristics ④⑤							
Input capacitance	C_{iss}	V_{DS} =20V,V_{GS} =0V, f =1MHz			2620		pF
Output capacitance	C_{oss}				690		
Reverse transfer capacitance	C_{rss}				26		
Switching characteristics ④⑤							
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=70A			47.7		nC
Gate-source charge	Q_{gs}				6		
Gate-drain charge	Q_{gd}				1.2		
Turn-on delay time	$t_{d(on)}$	V_{DS}=20V,I_D=35A, V_{GS}=10V,R_G=1.6Ω			8		ns
Turn-on rise time	t_r				30		
Turn-off delay time	$t_{d(off)}$				32		
Turn-off fall time	t_f				6		
Drain-Source Diode Characteristics							
Reverse Recovery Time	t_{rr}	I_{SD} =30A, dI_{SD}/dt=100A/μs			47		ns
Reverse Recovery Charge	Q_{rr}				35		nC
Drain-source diode forward voltage	V_{SD} ④	V_{GS} =0V, I_S=10A				1.2	V
Continuous drain-source diode forward current	I_S ①					130	A
Pulsed drain-source diode forward current	I_{SM} ②					390	A

Notes:

1.T_C=25℃ Limited only by maximum temperature allowed.

2.PW≤10μs, Duty cycle≤1%.

3.EAS condition: V_{DD}=25V,V_{GS}=10V, L=0.5mH, Rg=25Ω Starting T_J = 25°℃.

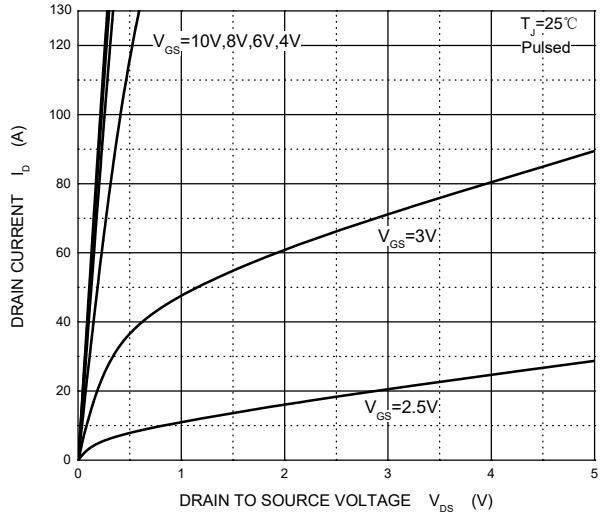
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

5.Guaranteed by design, not subject to production.

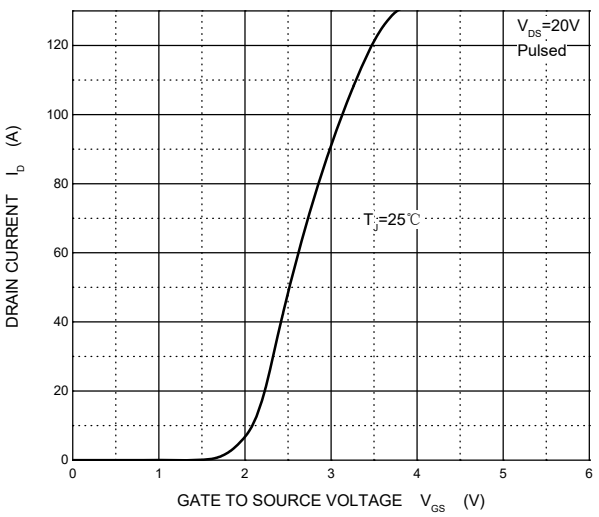
6.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.

Typical Characteristics

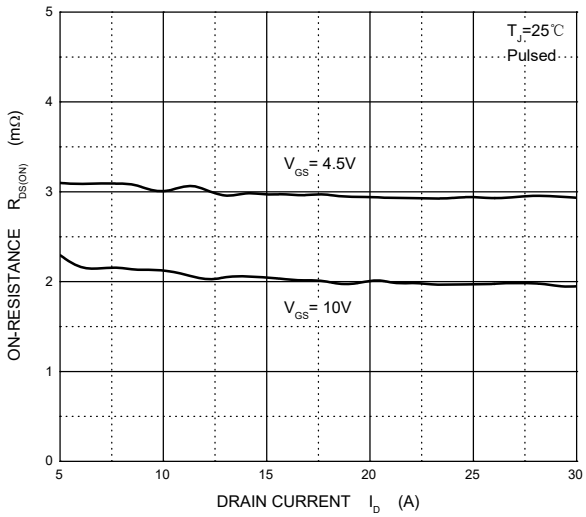
Output Characteristics



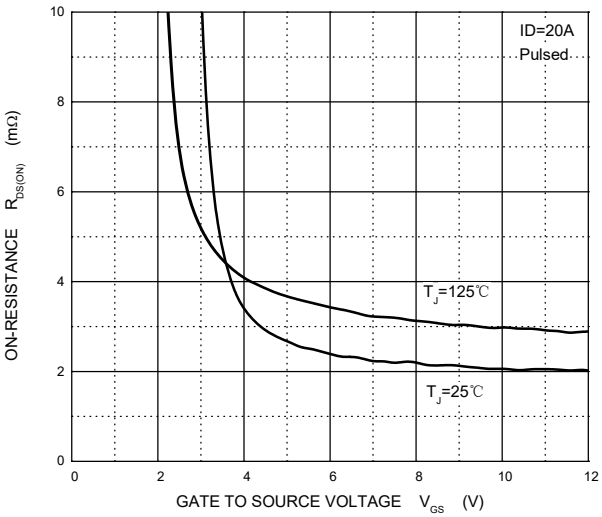
Transfer Characteristics



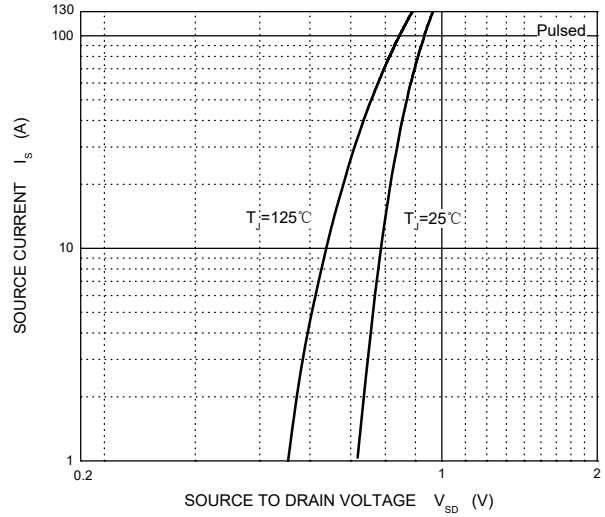
$R_{DS(ON)}$ —— I_D



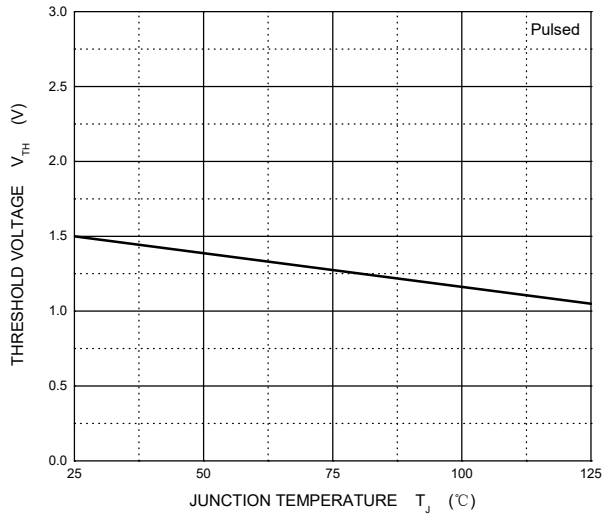
$R_{DS(ON)}$—— V_{GS}



I_S —— V_{SD}

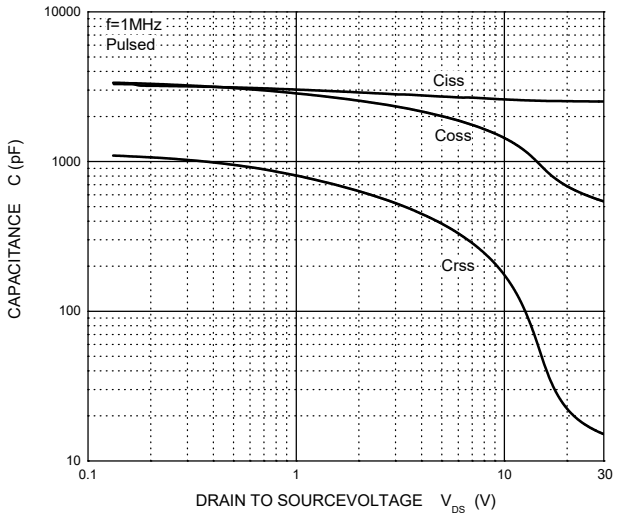


Threshold Voltage

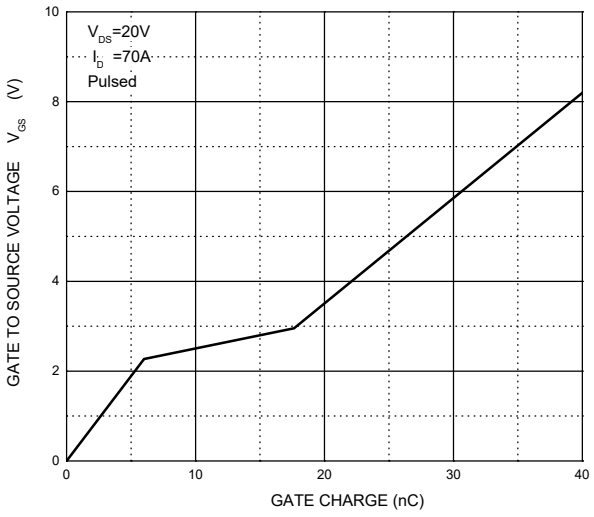


Typical Characteristics

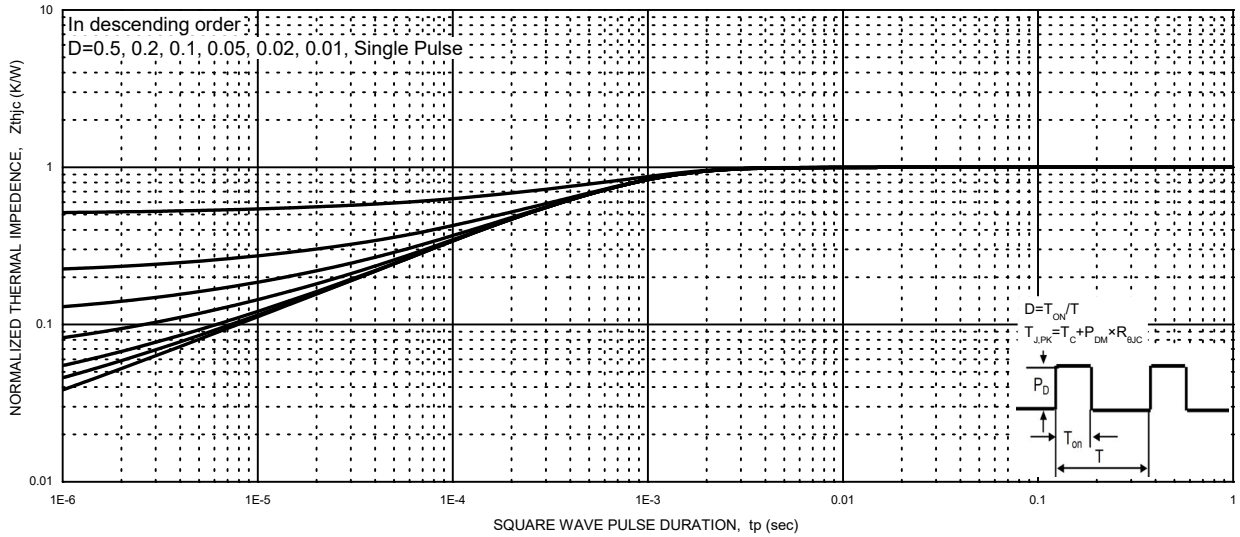
Capacitances



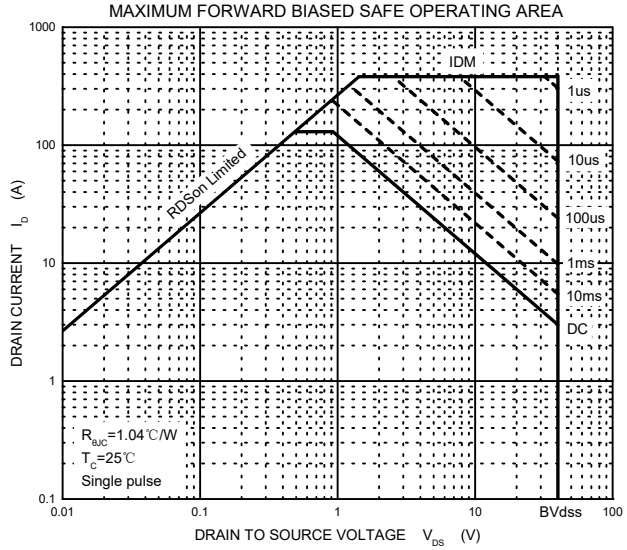
Gate Charge



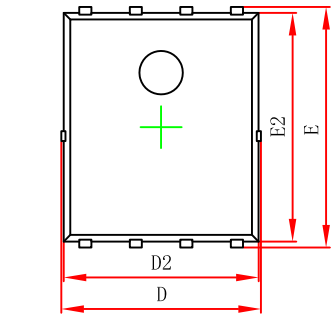
NORMALIZED TRAISIENT THERMAL IMPENDANCE



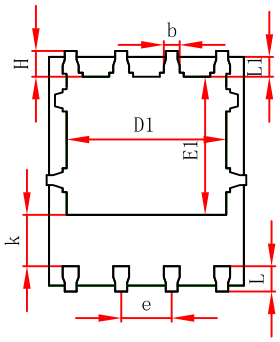
MAXIMUM FORWARD BIASED SAFE OPERATING AREA



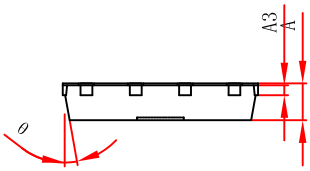
PDFNWB5x6-8L Package Outline Dimensions



Top View
[顶视图]



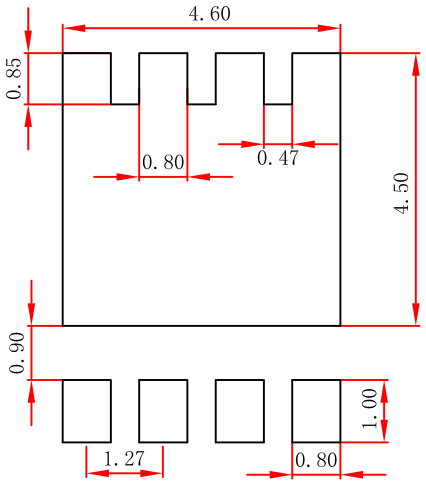
Bottom View
[背视图]



Side View
[侧视图]

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°

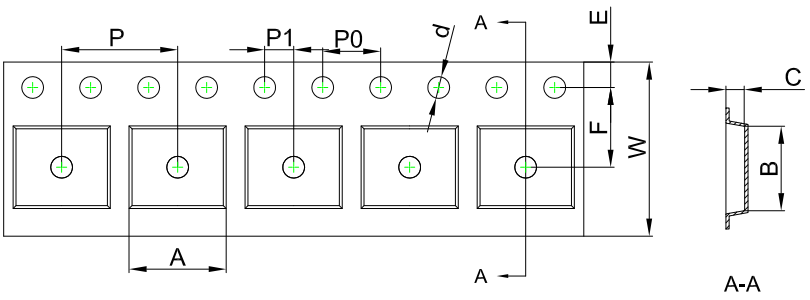
PDFNWB5x6-8L Suggested Pad Layout



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

PDFNWB5×6 Tape and Reel

PDFNWB5×6-8L Embossed Carrier Tape

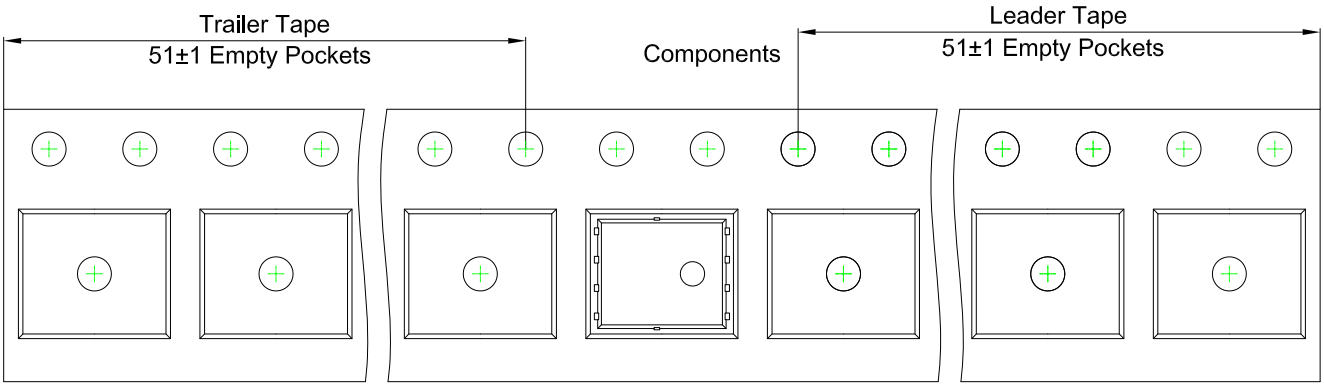


Packaging Description:

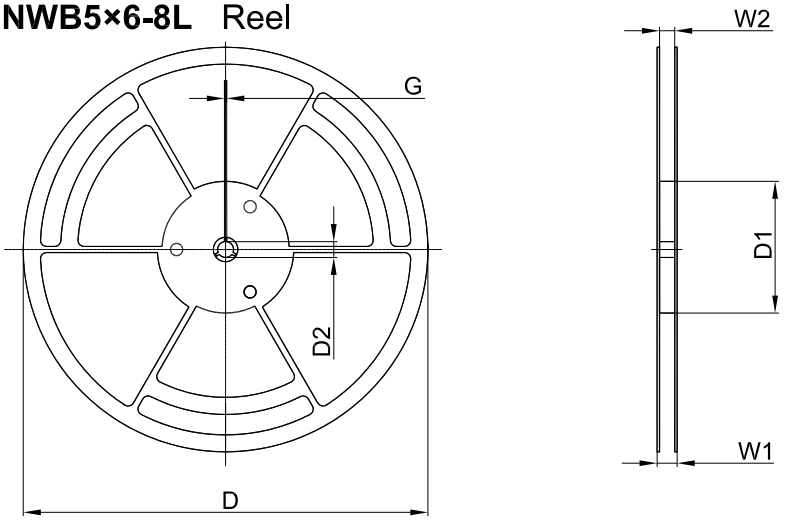
PDFNWB5×6-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFNWB5×6-8L	6.30	5.30	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFNWB5×6-8L Tape Leader and Trailer



PDFNWB5×6-8L Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 inch	5,000 pcs	340×336×29	50,000 pcs	353×346×365