

勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-34970699 胜特力电子(深圳) 86-755-83298787

Http://www.100y.com.tw

STD5N20L

N-CHANNEL 200V - 0.65Ω - 5A DPAK STripFET™ MOSFET

Table 1: General Features

TYPE	V _{DSS}	R _{DS(on)}	I _D	Pw
STD5N20L	200 V	< 0.7 Ω	5 A	33 W

- TYPICAL $R_{DS}(on) = 0.65 \Omega @ 5V$
- CONDUCTION LOSSES REDUCED
- LOW INPUT CAPACIATNCE
- LOW THRESHOLD DEVICE

DESCRIPTION

The STD5N20L utilizes the latest advanced design rules of ST's proprietary STripFET™ technology. This is suitable for the most demanding DC Motor Control and lighting application.

APPLICATIONS

- UPS AND MOTOR CONTROL
- LIGHTING

Figure 1: Package

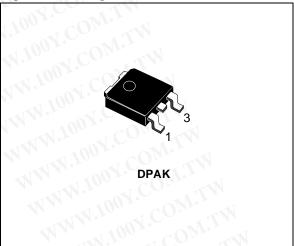


Figure 2: Internal Schematic Diagram

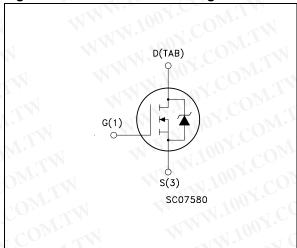


Table 2: Order Codes

SALES TYPE	MARKING	PACKAGE	PACKAGING
STD5N20LT4	D5N20L	DPAK	TAPE & REEL

Rev. 3

Table 3: Absolute Maximum ratings

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	200	V
V_{DGR}	Drain-gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)	200	V
V _G S	Gate- source Voltage	±20	V
ID	Drain Current (continuous) at T _C = 25°C	5	А
ID	Drain Current (continuous) at T _C = 100°C	3.6	А
I _{DM} (•)	Drain Current (pulsed)	20	А
P _{TOT}	Total Dissipation at T _C = 25°C	33	W
	Derating Factor	0.27	W/°C
T _{stg}	Storage Temperature	FF to 150	°C
Tj	Operating Junction Temperature	-55 to 150	

^(•) Pulse width limited by safe operating area

Table 4: Thermal Data

Rthj-case	Thermal Resistance Junction-case Max	3.75	°C/W
Rthj-amb	Thermal Resistance Junction-ambient Max	100	°C/W
Tı	Maximum Lead Temperature For Soldering Purpose	275	°C

ELECTRICAL CHARACTERISTICS (T_{CASE} =25°C UNLESS OTHERWISE SPECIFIED)

Table 5: On/Off

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Uni
V _{(BR)DSS}	Drain-source Breakdown Voltage	$I_D = 250 \mu\text{A}, V_{GS} = 0$	200	1.100 X	COM:	V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V_{DS} = Max Rating V_{DS} = Max Rating, T_{C} = 125°C	N	N.100	10	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ±20V	W	NW.	±100	nA
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 50\mu A$	1		2.5	V
R _{DS(on)}	Static Drain-source On Resistance	$V_{GS} = 5 \text{ V}, I_D = 2.5 \text{ A}$	sT	0.65	0.7	Ω

2/10 NWW 1007 COM 100

Table 6: Dynamic

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
g _{fs} (2)	Forward Transconductance	$V_{DS} = 15 \text{ V}, I_{D} = 5 \text{ A}$		6.5		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25V, f = 1 MHz, V _{GS} = 0	7	242 44 6		pF pF pF
t _d (on) t _r t _{d(off)} t _f	Turn-on Delay Time Rise Time Turn-off Delay Time Fall Time	V_{DD} = 100 V, I_{D} = 2.5 A R_{G} = 4.7 Ω , V_{GS} = 5V (Resistive Load see Figure 14)	T.T.N.	11.5 21.5 14 15.5		ns ns ns ns
Q _g Q _{gs} Q _{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V _{DD} = 160 V, I _D = 5 A, V _{GS} = 5V	ON'L	5 1.5 3	6	nC nC nC

Table 7: Source Drain Diode

Symbol	Parameter Source-drain Current	Test Conditions	Min.	Тур.	Max.	Un A
I _{SDM} (*) V _{SD} (1)	Source-drain Current (pulsed) Forward On Voltage	I _{SD} = 5 A, V _{GS} = 0	NON.		20 1.5	A V
t _{rr} Q _{rr}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 5 \text{ A}$, $V_{GS} = 0$ $I_{SD} = 5 \text{ A}$, di/dt = 100 A/ μ s, $V_{DD} = 100 \text{ V}$, $T_j = 25^{\circ}\text{C}$ (see test circuit, see Figure 15)	7.100 y	93 237 5.1	LTW	ns nC A
t _{rr} Q _{rr} I _{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 5 \text{ A}$, di/dt = 100 A/ μ s, $V_{DD} = 100 \text{ V}$, $T_j = 150 ^{\circ}\text{C}$ (see test circuit, see Figure 15)	W.100	97 286 5.9	OMIT	ns nC A

⁽¹⁾ Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.

WW.100Y.COM.TW

MM.100X.

100 Y.COM.TW

W COM

100 Y.COM.TW

'WA COM!

⁽²⁾ Starting $T_i = 25 \, ^{\circ}\text{C}$, $I_d = 5 \, \text{A}$, $V_{DD} = 50 \, \text{V}$

^(*) Pulse width limited by safe operating area WWW.100Y.COM.TW

Figure 3: Safe Operating Area

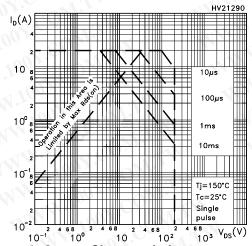


Figure 4: Output Characteristics

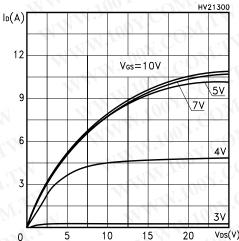


Figure 5: Transconductance

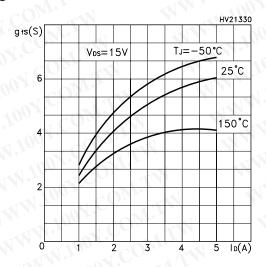


Figure 6: Thermal Impedance

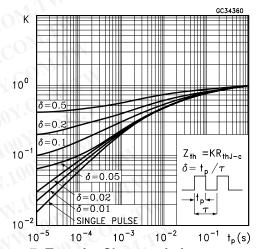


Figure 7: Transfer Characteristics

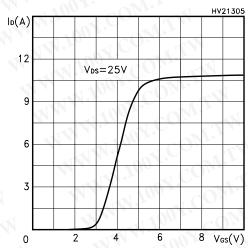


Figure 8: Static Drain-source On Resistance

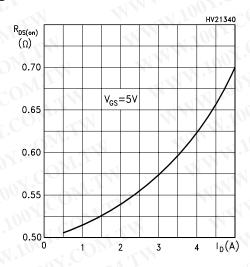


Figure 9: Gate Charge vs Gate-source Voltage

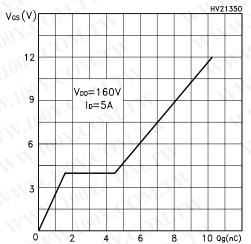


Figure 10: Normalized Gate Thereshold Voltage vs Temperature

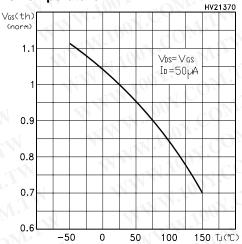


Figure 11: Source-Drain Diode Forward Characteristics

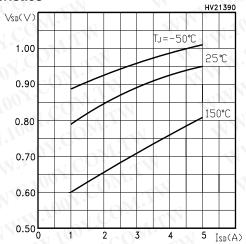


Figure 12: Capacitance Variations

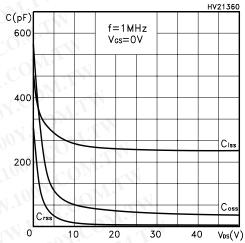


Figure 13: Normalized On Resistance vs Temperature

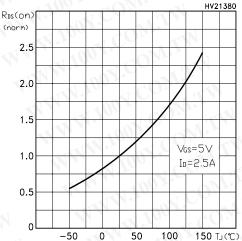


Figure 14: Switching Times Test Circuit For Resistive Load

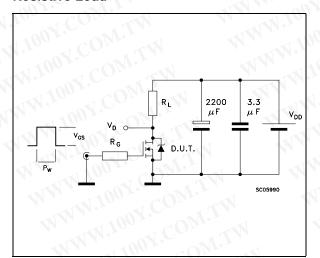


Figure 15: Test Circuit For Inductive Load Switching and Diode Recovery Times

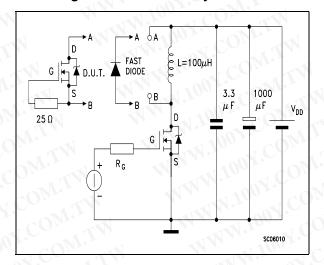
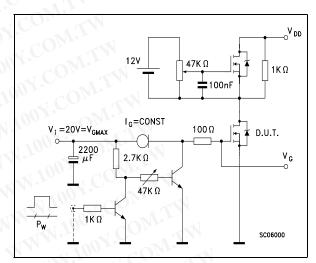


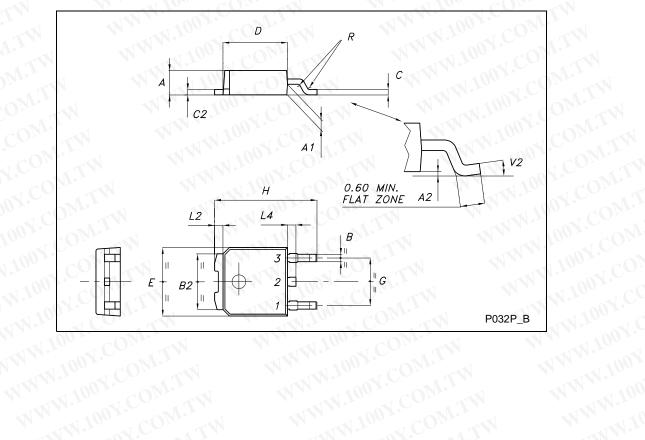
Figure 16: Gate Charge Test Circuit



57.

TO-252 (DPAK) MECHANICAL DATA

	T	O-252 (DPA	K) MECHA	NICAL DAT	Α	
COA	411		11.100	$C_{O_{\mathbb{N}}}$		
DIM.	mm			inch		
N.C.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035	M. Tani	0.043
A2	0.03	1	0.23	0.001		0.009
В	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204	ONL	0.213
C	0.45	× 1	0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236	<1 COA	0.244
E	6.40	M.	6.60	0.252	201	0.260
G	4.40	M.T.	4.60	0.173	W. J.	0.181
Н	9.35		10.10	0.368	N.C.	0.398
L2	1.100	0.8	N		0.031	$O_{D_{I}}$.
L4	0.60	W.	1.00	0.024	1007	0.039
V2	0°	.00	8°	0°	N.	0°



WW.100Y.COM.TW

100 X.C

100 Y. COM. TW

W COM!

TAM. TOOK COM . LA

WW.100X.

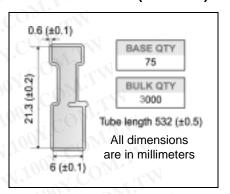
OOY.COM.TW

W COM.

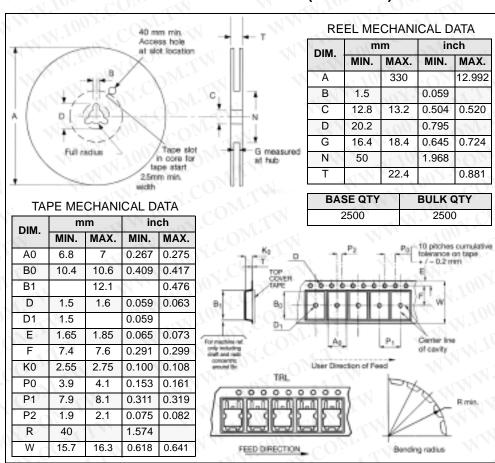
DPAK FOOTPRINT

6.7 1.8 3.0 1.6 2.3 2.3 All dimensions are in millimeters

TUBE SHIPMENT (no suffix)*



TAPE AND REEL SHIPMENT (suffix "T4")*



^{*} on sales type

Date	Revision	Description of Changes
08-June-2004	2	New Stylesheet. Datasheet according to PCN DSG-TRA/04/532
20-Sep-2004	3	Changes on Table 3, and on Figure 3.

COM.TW

MMM.In.

ATTOOX.CON

WWW.100Y.COM.TW

WWW.100Y.COM.TW

TOTAL TONY. COM. TW

WWW.100Y.COM.TW

WWW.100X.COM.TW

TOTAL TONY.COM.TW

勝 特 力 材 料 886-3-5753170 胜特力电子(上海) 86-21-34970699 胜特力电子(深圳) 86-755-83298787 Http://www.100y.com.tw

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics All other names are the property of their respective owners

© 2004 STMicroelectronics - All Rights Reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

٧٧.