



STW8NA80 STH8NA80FI

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTORS

PRELIMINARY DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STW8NA80	800 V	< 1.50 Ω	7.2 A
STH8NA80FI	800 V	< 1.50 Ω	4.5 A

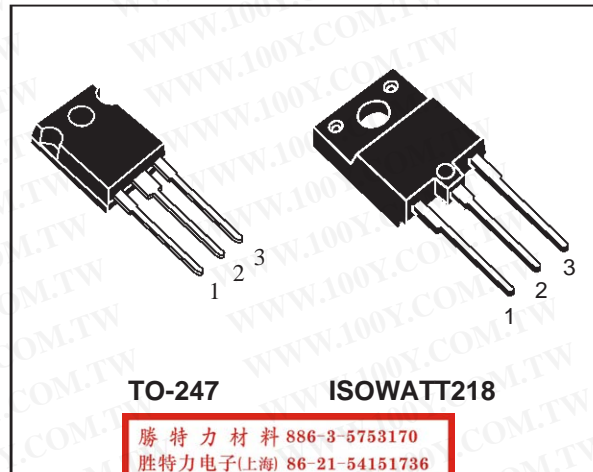
- TYPICAL R_{DS(on)} = 1.3 Ω
- ± 30V GATE TO SOURCE VOLTAGE RATING
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- LOW INTRINSIC CAPACITANCES
- GATE CHARGE MINIMIZED
- REDUCED THRESHOLD VOLTAGE SPREAD

DESCRIPTION

This series of POWER MOSFETS represents the most advanced high voltage technology. The optimized cell layout coupled with a new proprietary edge termination concur to give the device low R_{DS(on)} and gate charge, unequalled ruggedness and superior switching performance.

APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SWITCH MODE POWER SUPPLIES (SMPS)
- DC-AC CONVERTERS FOR WELDING EQUIPMENT AND UNINTERRUPTIBLE POWER SUPPLIES AND MOTOR DRIVE

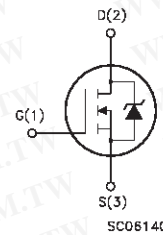


TO-247

ISOWATT218

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
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INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		STW8NA80	STH8NA80FI	
V _{DS}	Drain-source Voltage (V _{GS} = 0)	800		V
V _{DGR}	Drain- gate Voltage (R _{GS} = 20 kΩ)	800		V
V _{GS}	Gate-source Voltage	± 30		V
I _D	Drain Current (continuous) at T _c = 25 °C	7.2	4.5	A
I _D	Drain Current (continuous) at T _c = 100 °C	4.5	2.8	A
I _{DM} (•)	Drain Current (pulsed)	28.8	28.8	A
P _{tot}	Total Dissipation at T _c = 25 °C	175	70	W
	Derating Factor	1.4	0.56	W/°C
V _{ISO}	Insulation Withstand Voltage (DC)	—	4000	V
T _{stg}	Storage Temperature	-65 to 150		°C
T _j	Max. Operating Junction Temperature	150		°C

(•) Pulse width limited by safe operating area

STW8NA80 STH8NA80FI

THERMAL DATA

		TO-247	ISOWATT218		
R _{thj-case}	Thermal Resistance Junction-case	Max	0.71	1.78	°C/W
R _{thj-amb}	Thermal Resistance Junction-ambient	Max	30		°C/W
R _{thc-sink}	Thermal Resistance Case-sink	Typ	0.1		°C/W
T _l	Maximum Lead Temperature For Soldering Purpose		300		°C

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I _{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T _j max, δ < 1%)	7.2	A
E _{AS}	Single Pulse Avalanche Energy (starting T _j = 25 °C, I _D = I _{AR} , V _{DD} = 50 V)	700	mJ

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	I _D = 250 μA V _{GS} = 0	800			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating T _C = 100 °C			50 500	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 30 V			100	nA

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ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 μA	2.25	3	3.75	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10V I _D = 4A		1.3	1.5	Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} × R _{DS(on)max} V _{GS} = 10 V	7.2			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} × R _{DS(on)max} I _D = 4 A	4.5	7.9		S
C _{iss}	Input Capacitance			1750	2300	pF
C _{oss}	Output Capacitance			188	245	pF
C _{rss}	Reverse Transfer Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0		50	70	pF

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ELECTRICAL CHARACTERISTICS (continued)**SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Time	$V_{DD} = 400\text{ V}$		20	28	ns
t_r	Rise Time	$R_G = 4.7\ \Omega$ $I_D = 4\text{ A}$ $V_{GS} = 10\text{ V}$		28	38	ns
$(di/dt)_{on}$	Turn-on Current Slope	$V_{DD} = 640\text{ V}$ $I_D = 8\text{ A}$ $R_G = 47\ \Omega$ $V_{GS} = 10\text{ V}$		170		A/ μ s
Q_g	Total Gate Charge			75	100	nC
Q_{gs}	Gate-Source Charge	$V_{DD} = 400\text{ V}$ $I_D = 8\text{ A}$ $V_{GS} = 10\text{ V}$		10		nC
Q_{gd}	Gate-Drain Charge			35		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$	Off-voltage Rise Time	$V_{DD} = 640\text{ V}$ $I_D = 8\text{ A}$		18	25	ns
t_f	Fall Time	$R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$		20	28	ns
t_c	Cross-over Time			25	35	ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				7.2	A
$I_{SDM}(\bullet)$	Source-drain Current (pulsed)				28.8	A
$V_{SD}(\ast)$	Forward On Voltage	$I_{SD} = 7.2\text{ A}$ $V_{GS} = 0$			1.6	V
t_{rr}	Reverse Recovery Time			850		ns
Q_{rr}	Reverse Recovery Charge	$I_{SD} = 7.5\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 100\text{ V}$ $T_j = 150\text{ }^\circ\text{C}$		17		μ C
I_{RRM}	Reverse Recovery Current			40		A

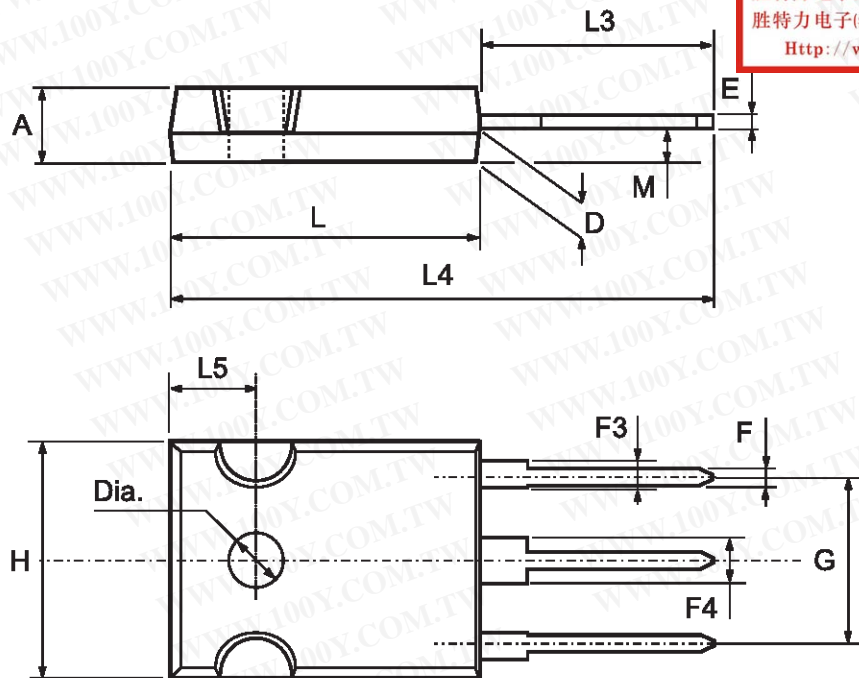
(*) Pulsed: Pulse duration = 300 μ s, duty cycle 1.5 %

(●) Pulse width limited by safe operating area

TO-247 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		5.3	0.185		0.209
D	2.2		2.6	0.087		0.102
E	0.4		0.8	0.016		0.031
F	1		1.4	0.039		0.055
F3	2		2.4	0.079		0.094
F4	3		3.4	0.118		0.134
G		10.9			0.429	
H	15.3		15.9	0.602		0.626
L	19.7		20.3	0.776		0.779
L3	14.2		14.8	0.559	0.413	0.582
L4		34.6			1.362	
L5		5.5			0.217	
M	2		3	0.079		0.118
Dia	3.55		3.65	0.140		0.144

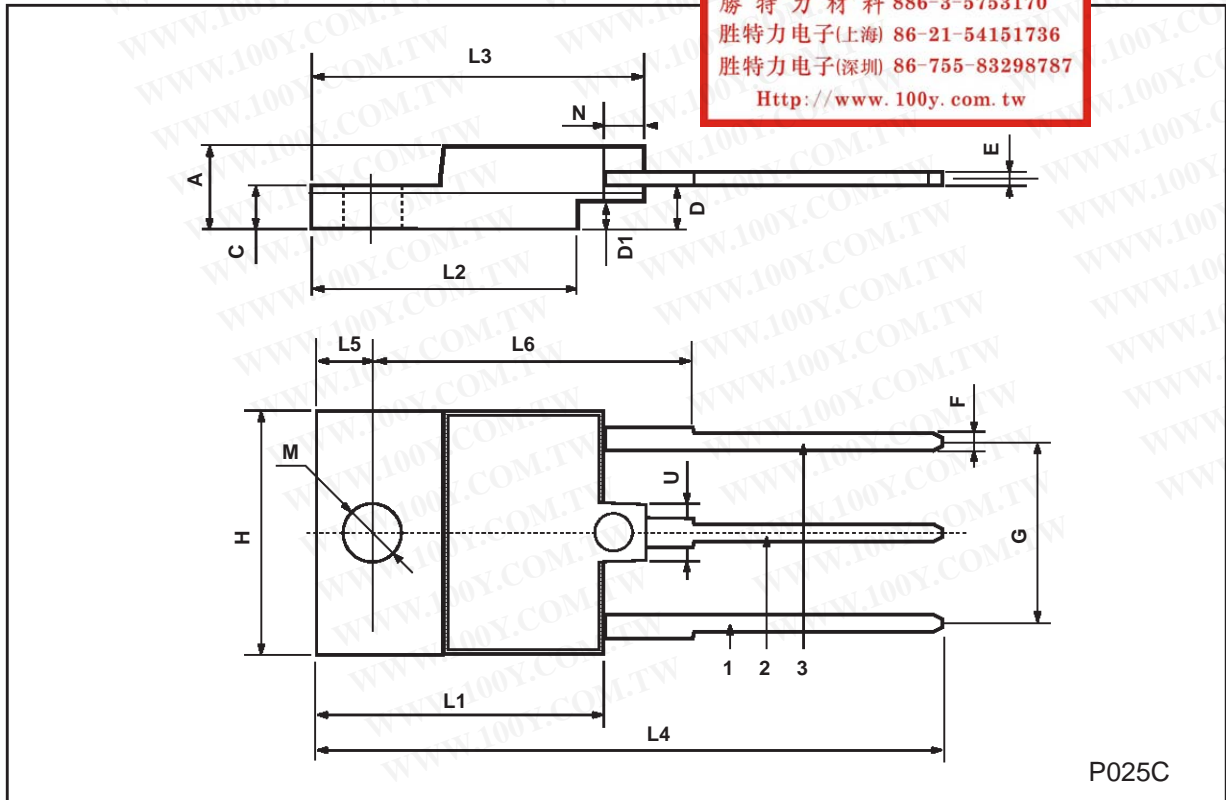
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DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.35		5.65	0.210		0.222
C	3.3		3.8	0.130		0.149
D	2.9		3.1	0.114		0.122
D1	1.88		2.08	0.074		0.081
E	0.75		1	0.029		0.039
F	1.05		1.25	0.041		0.049
G	10.8		11.2	0.425		0.441
H	15.8		16.2	0.622		0.637
L1	20.8		21.2	0.818		0.834
L2	19.1		19.9	0.752		0.783
L3	22.8		23.6	0.897		0.929
L4	40.5		42.5	1.594		1.673
L5	4.85		5.25	0.190		0.206
L6	20.25		20.75	0.797		0.817
M	3.5		3.7	0.137		0.145
N	2.1		2.3	0.082		0.090
U		4.6			0.181	

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