N-channel enhancement mode MOS transistor

PHN105

FEATURES

- High speed switching
- No secondary breakdown
- Very low on-resistance.

APPLICATIONS

- Motor and actuator driver, power management, synchronized rectifying, etc.

PINNING - SO8 (SOT96-1)

PIN	SYMBOL	DESCRIPTION
1	n.c	not connected
2	s	source
3	s	source
4	g	gate
5	d	drain
6	d	drain
7	d	drain
8	d	drain

DESCRIPTION

N-channel enhancement mode MOS transistor in an 8-pin plastic SO8 (SOT96-1) package.

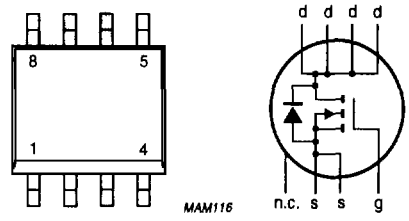

Fig.1 Simplified outline and symbol.

CAUTION
The device is supplied in an antistatic package. The gate-source input must be protected against static discharge during transport or handling.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	20	V
V_{SD}	source-drain diode forward voltage	I_S = 1.25 A	–	1.2	V
V_{GSO}	gate-source voltage (DC)	open drain	–	±20	V
V_{GSth}	gate-source threshold voltage	I_D = 1 mA; $V_{DS} = V_{GS}$	1	2.8	V
I_D	drain current (DC)		–	4.8	A
R_{DSon}	drain-source on-state resistance	I_D = 5.5 A; V_{GS} = 10 V	–	0.05	Ω
P_{tot}	total power dissipation	up to T_s = 80 °C	–	2	W

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LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	20	V
V_{GSO}	gate-source voltage (DC)	open drain	–	±20	V
I_D	drain current (DC)	$T_s \leq 80$ °C	–	4.8	A
I_{DM}	peak drain current	note 1	–	20	A
P_{tot}	total power dissipation	up to $T_s = 80$ °C	–	2	W
		up to $T_{amb} = 25$ °C; note 2	–	2	W
		up to $T_{amb} = 25$ °C; note 3	–	1.3	W
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	150	°C
Source-drain diode					
I_S	source current (DC)	$T_s \leq 80$ °C	–	1.5	A
I_{SM}	peak pulsed source current	note 1	–	12	A

Notes

1. Pulse width and duty cycle limited by maximum junction temperature.
2. Value based on PCB with a $R_{th\ a\text{-}tp}$ (ambient to tie-point) of 27.5 K/W.
3. Value based on PCB with a $R_{th\ a\text{-}tp}$ (ambient to tie-point) of 90 K/W.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	35	K/W

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CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0; I_D = 10 µA	20	–	–	V
V_{GSth}	gate-source threshold voltage	V_{GS} = V_{DS}; I_D = 1 mA	1	–	2.8	V
I_{DSS}	drain-source leakage current	V_{GS} = 0; V_{DS} = 15 V	–	–	100	nA
I_{GSS}	gate leakage current	V_{GS} = ±20 V; V_{DS} = 0	–	–	±100	nA
I_{Don}	on-state drain current	V_{GS} = 10 V; V_{DS} = 5 V	7	–	–	A
R_{DSon}	drain-source on-state resistance	V_{GS} = 4.5 V; I_D = 2 A	–	–	0.1	Ω
		V_{GS} = 10 V; I_D = 4.4 A	–	–	0.05	Ω
$\|y_{fs}\|$	forward transfer admittance	V_{DS} = 10 V; I_D = 1 A	tbf	–	–	S
C_{iss}	input capacitance	V_{GS} = 0; V_{DS} = 10 V; f = 1 MHz	–	–	tbf	pF
C_{oss}	output capacitance	V_{GS} = 0; V_{DS} = 10 V; f = 1 MHz	–	–	tbf	pF
C_{rss}	reverse transfer capacitance	V_{GS} = 0; V_{DS} = 10 V; f = 1 MHz	–	–	tbf	pF
Q_g	total gate charge	V_{GS} = 10 V; V_{DS} = 10 V; I_D = 1.8 A	–	–	tbf	nC
Q_{gs}	gate-source charge	V_{GS} = 10 V; V_{DS} = 10 V; I_D = 1.8 A	–	–	tbf	nC
Q_{gd}	gate-drain charge	V_{GS} = 10 V; V_{DS} = 10 V; I_D = 1.8 A	–	–	tbf	nC
t_{on}	turn-on time	V_{GS} = 0 to 10 V; V_{DD} = 10 V; I_D = 1 A; R_L = 10 Ω	–	–	tbf	ns
t_{off}	turn-off time	V_{GS} = 10 to 0 V; V_{DD} = 10 V; I_D = 1 A; R_L = 10 Ω	–	–	tbf	ns
Source-drain diode						
V_{SD}	source drain diode forward voltage	V_{GS} = 0; I_S = 1.25 A	–	–	1.2	V
t_{rr}	reverse recovery time	I_S = 1.25 A; di/dt = 100 A/µs	–	–	tbf	ns