SGS-THOMSON MICROELECTRONICS

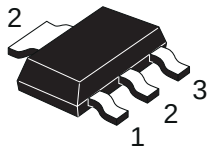
STN2N10L

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

ADVANCE DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_{D}CONT
STN2N10L	100 V	< 0.5 Ω	2 A

- TYPICAL $R_{DS(on)}$ = 0.35 Ω
- AVALANCHE RUGGED TECHNOLOGY
- SOT-223 CAN BE WAVE OR REFLOW SOLDERED
- AVAILABLE IN TAPE AND REEL ON REQUEST
- 150 °C OPERATING TEMPERATURE
- APPLICATION ORIENTED CHARACTERIZATION

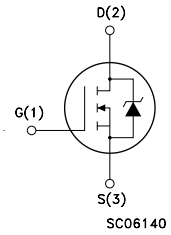


SOT-223

APPLICATIONS

- HARD DISK DRIVERS
- SMALL MOTOR CURRENT SENSE CIRCUITS
- DC-DC CONVERTERS AND POWER SUPPLIES

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage (V_{GS} = 0)	100	V
V_{DGR}	Drain- gate Voltage (R_{GS} = 20 kΩ)	100	V
V_{GS}	Gate-source Voltage	± 15	V
I_{D}(*)	Drain Current (continuous) at T_c = 25 °C	2	A
I_{D}(*)	Drain Current (continuous) at T_c = 100 °C	1.3	A
I_{DM}(•)	Drain Current (pulsed)	8	A
P_{tot}	Total Dissipation at T_c = 25 °C	2.7	W
	Derating Factor	0.022	W/°C
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

(•) Pulse width limited by safe operating area (*) Limited by package

THERMAL DATA

$R_{thj\text{-}pcb}$	Thermal Resistance Junction-PC Board	Max	46	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient (Surface Mounted)	Max	60	$^oC/W$
T_l	Maximum Lead Temperature For Soldering Purpose		260	^oC

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max, $\delta < 1\%$)	2	A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25\ ^oC$, $I_D = I_{AR}$, $V_{DD} = 25$ V)	20	mJ
E_{AR}	Repetitive Avalanche Energy (pulse width limited by T_j max, $\delta < 1\%$)	5	mJ
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive ($T_c = 100\ ^oC$, pulse width limited by T_j max, $\delta < 1\%$)	1.3	A

ELECTRICAL CHARACTERISTICS ($T_{case} = 25\ ^oC$ unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250\ \mu A$ $V_{GS} = 0$	100			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	V_{DS} = Max Rating V_{DS} = Max Rating x 0.8 $T_c = 125\ ^oC$			250 1000	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 15$ V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu A$	1	1.8	2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 5$ V $I_D = 1$ A $V_{GS} = 5$ V $I_D = 1$ A $T_c = 100^oC$		0.35	0.5 1	Ω Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10$ V	2			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 1$ A	1	2.5		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	$V_{DS} = 25$ V f = 1 MHz $V_{GS} = 0$ V		340 65 20	450 100 30	pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Time Rise Time	V_{DD} = 50 V I_D = 4 A R_G = 4.7 Ω V_{GS} = 5 V		6 20	10 30	ns ns
$(di/dt)_{on}$	Turn-on Current Slope	V_{DD} = 80 V I_D = 8 A R_G = 4.7 Ω V_{GS} = 5 V		380		A/µs
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD} = 80 V I_D = 8 A V_{GS} = 5 V		10 6 3	15	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	V_{DD} = 80 V I_D = 8 A R_G = 4.7 Ω V_{GS} = 5 V		10 10 20	15 15 30	ns ns ns

SOURCE DRAIN DIODE

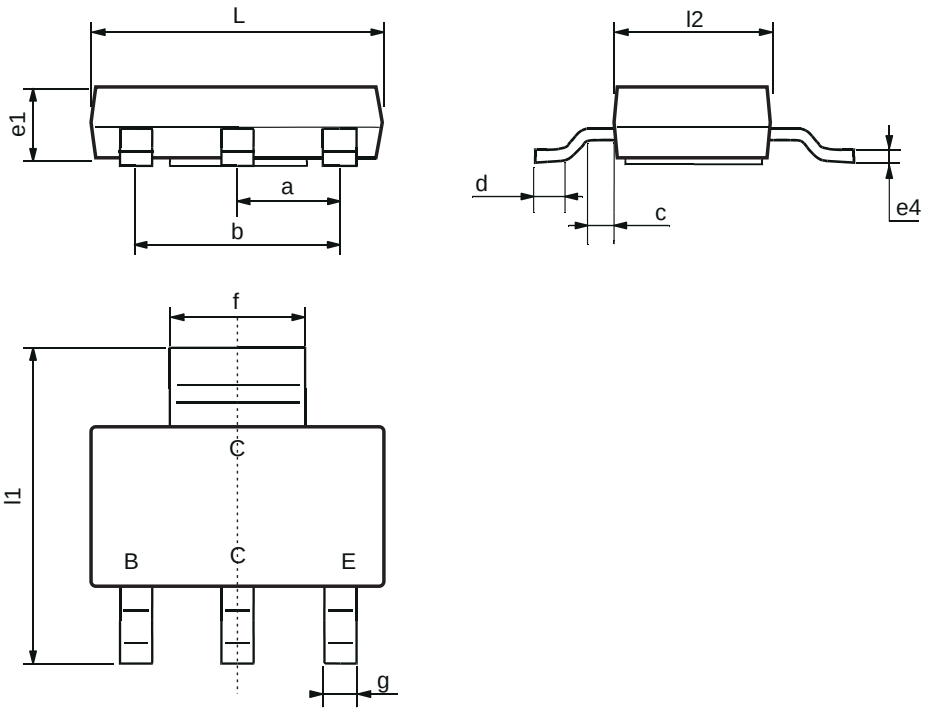
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}(•)	Source-drain Current Source-drain Current (pulsed)				2 8	A A
V_{SD} (∗)	Forward On Voltage	I_{SD} = 2 A V_{GS} = 0			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 8 A di/dt = 100 A/µs V_{DD} = 30 V T_j = 150 °C		90 0.27 6		ns µC A

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

(•) Pulse width limited by safe operating area

SOT223 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a	2.27	2.3	2.33	89.4	90.6	91.7
b	4.57	4.6	4.63	179.9	181.1	182.3
c	0.2	0.4	0.6	7.9	15.7	23.6
d	0.63	0.65	0.67	24.8	25.6	26.4
e1	1.5	1.6	1.7	59.1	63	66.9
e4			0.32			12.6
f	2.9	3	3.1	114.2	118.1	122.1
g	0.67	0.7	0.73	26.4	27.6	28.7
l1	6.7	7	7.3	263.8	275.6	287.4
l2	3.5	3.5	3.7	137.8	137.8	145.7
L	6.3	6.5	6.7	248	255.9	263.8



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