SGS-THOMSON MICROELECTRONICS

STK17N10

# N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STK17N10	100 V	0.11 Ω	17 A

- AVALANCHE RUGGEDNESS TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- APPLICATION ORIENTED CHARACTERIZATION

APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- REGULATORS
- DC-DC & DC-AC CONVERTERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- AUTOMOTIVE ENVIRONMENT (INJECTION, ABS, AIR-BAG, LAMPDRIVERS, Etc.)

SOT-82

SOT-194 (option)

INTERNAL SCHEMATIC DIAGRAM
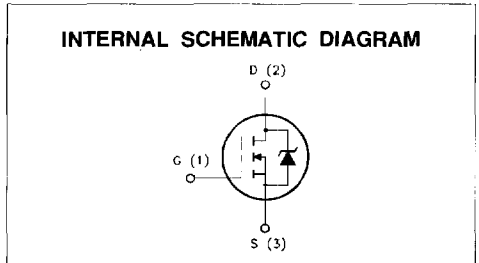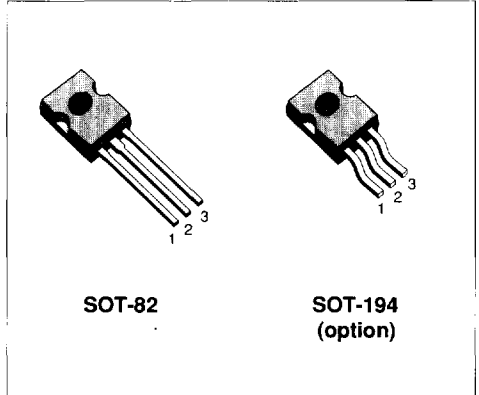
ABSOLUTE MAXIMUM RATINGS

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	± 20	V
I_D	Drain Current (continuous) at T_c = 25 °C	17	A
I_D	Drain Current (continuous) at T_c = 100 °C	11	A
$I_{DM}(\bullet)$	Drain Current (pulsed)	68	A
P_{tot}	Total Dissipation at T_c = 25 °C	60	W
	Derating Factor	0.48	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

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	2.08	^{o}C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	80	^{o}C/W
$R_{thj-amb}$	Thermal Resistance Case-sink	Typ	0.7	^{o}C/W
T	Maximum Lead Temperature For Soldering Purpose		275	^{o}C

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max, $\delta < 1\%$)	17	A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25\ ^{o}$C, $I_D = I_{AR}$, $V_{DD} = 25$ V)	80	mJ
E_{AR}	Repetitive Avalanche Energy (pulse width limited by T_j max, $\delta < 1\%$)	20	mJ
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive ($T_c = 100\ ^{o}$C, pulse width limited by T_j max, $\delta < 1\%$)	11	A

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

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250\ \mu$A $\quad V_{GS} = 0$	100			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	V_{DS} = Max Rating V_{DS} = Max Rating x 0.8 $\quad T_c = 125\ ^{o}$C			250 1000	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 20$ V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $\quad I_D = 250\ \mu$A	2		4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10$V $\quad I_D = 8.5$ A $V_{GS} = 10$V $\quad I_D = 8.5$ A $\quad T_c = 100^{o}$C			0.11 0.22	Ω Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)}$ x $R_{DS(on)max}$ $V_{GS} = 10$ V	17			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)}$ x $R_{DS(on)max}$ $\quad I_D = 8.5$ A		7		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	$V_{DS} = 25$ V $\quad f = 1$ MHz $\quad V_{GS} = 0$		800 260 80		pF pF pF

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ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Time	$V_{DD} = 36$ V $I_D = 8$ A		40		ns
t_r	Rise Time	$R_G = 15\ \Omega$ $V_{GS} = 10$ V (see test circuit, figure 3)		45		ns
$(di/dt)_{on}$	Turn-on Current Slope	$V_{DD} = 80$ V $I_D = 17$ A $R_G = 50\ \Omega$ $V_{GS} = 10$ V (see test circuit, figure 5)		350		A/µs
Q_g	Total Gate Charge	$V_{DD} = 80$ V $I_D = 17$ A $V_{GS} = 10$ V		25		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$	Off-voltage Rise Time	$V_{DD} = 80$ V $I_D = 17$ A		50		ns
t_f	Fall Time	$R_G = 50\ \Omega$ $V_{GS} = 10$ V		40		ns
t_c	Cross-over Time	(see test circuit, figure 5)		90		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				17	A
$I_{SDM}(\bullet)$	Source-drain Current (pulsed)				68	A
V_{SD} (*)	Forward On Voltage	$I_{SD} = 17$ A $V_{GS} = 0$			1.7	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 17$ A $di/dt = 100$ A/µs $V_{DD} = 30$ V $T_j = 150$ °C		200		ns
Q_{rr}	Reverse Recovery Charge	(see test circuit, figure 5)		0.7		µC
I_{RRM}	Reverse Recovery Current			7		A

(*) Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
(•) Pulse width limited by safe operating area

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