

N - CHANNEL ENHANCEMENT MODE " SINGLE FEATURE SIZE™ " POWER MOSFET

TYPE	V _{DSS}	R _{DS(on)}	I _D
STP50NE08	80 V	<0.024 Ω	50 A

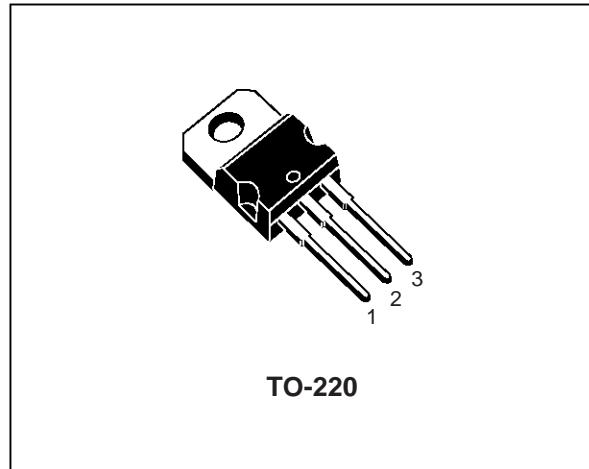
- TYPICAL R_{DS(on)} = 0.020 Ω
- EXCEPTIONAL dv/dt CAPABILITY
- 100% AVALANCHE TESTED
- LOW GATE CHARGE AT 100 °C
- APPLICATION ORIENTED CHARACTERIZATION

DESCRIPTION

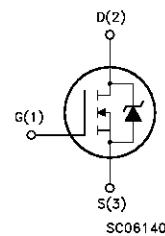
This Power MOSFET is the latest development of SGS-THOMSON unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

APPLICATIONS

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



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	80	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 kΩ)	80	V
V _{GS}	Gate-source Voltage	± 20	V
I _D	Drain Current (continuous) at T _c = 25 °C	50	A
I _D	Drain Current (continuous) at T _c = 100 °C	35	A
I _{DM(•)}	Drain Current (pulsed)	200	A
P _{tot}	Total Dissipation at T _c = 25 °C	150	W
	Derating Factor	1	W/°C
dv/dt (1)	Peak Diode Recovery voltage slope	6	V/ns
T _{stg}	Storage Temperature	-65 to 175	°C
T _j	Max. Operating Junction Temperature	175	°C

(•) Pulse width limited by safe operating area

(1) I_{SD} ≤ 50 A, di/dt ≤ 300 A/μs, V_{DD} ≤ V_{(BR)DSS}, T_j ≤ T_{JMAX}

STP50NE08

THERMAL DATA

R _{thj-case}	Thermal Resistance Junction-case	Max	1	°C/W
R _{thj-amb}	Thermal Resistance Junction-ambient	Max	62.5	°C/W
R _{thc-sink}	Thermal Resistance Case-sink	Typ	0.5	°C/W
T _I	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%)	50	A
E _{AS}	Single Pulse Avalanche Energy (starting T _j = 25 °C, I _D = I _{AR} , V _{DD} = 50 V)	300	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	80			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating T _c = 125 °C			1 10	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 20 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 μA	2	3	4	V
R _{D(on)}	Static Drain-source On Resistance	V _{GS} = 10V I _D = 25 A		0.020	0.024	mΩ
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} × R _{D(on)max} V _{GS} = 10 V	50			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} × R _{D(on)max} I _D = 25 A	20	35		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0		3850 480 105	5100 650 140	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	$V_{DD} = 40 \text{ V}$ $I_D = 25 \text{ A}$ $R_G = 4.7 \Omega$ $V_{GS} = 10 \text{ V}$ (see test circuit, figure 3)		37 95	50 130	ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 64 \text{ V}$ $I_D = 50 \text{ A}$ $V_{GS} = 10 \text{ V}$		85 19 28	110	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	$V_{DD} = 64 \text{ V}$ $I_D = 50 \text{ A}$ $R_G = 4.7 \Omega$ $V_{GS} = 10 \text{ V}$ (see test circuit, figure 5)		12 30 50	17 40 68	ns ns ns

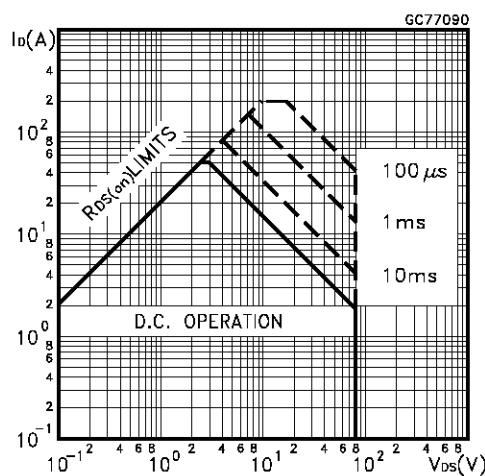
SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				50 200	A A
$V_{SD} (\ast)$	Forward On Voltage	$I_{SD} = 50 \text{ A}$ $V_{GS} = 0$			1.5	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 50 \text{ A}$ $di/dt = 100 \text{ A}/\mu\text{s}$ $V_{DD} = 30 \text{ V}$ $T_j = 150^\circ\text{C}$		100		ns
Q_{rr}	Reverse Recovery Charge	(see test circuit, figure 5)		400		nC
I_{RRM}	Reverse Recovery Current			8		A

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

(•) Pulse width limited by safe operating area

Safe Operating Area



Thermal Impedance

