

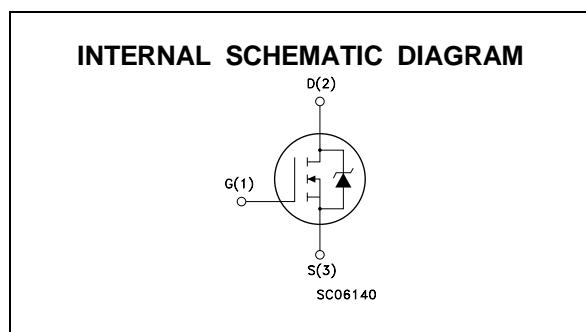
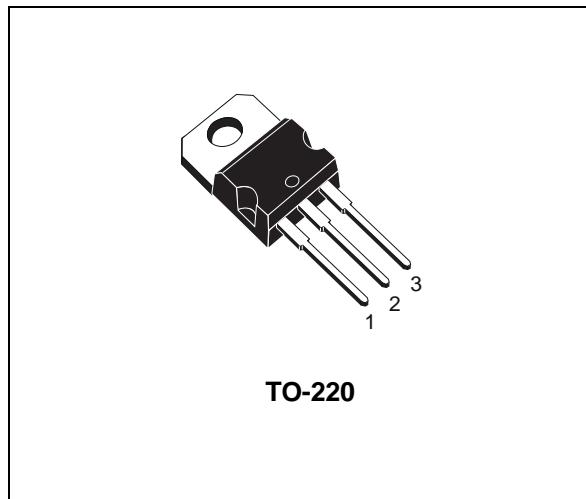
N - CHANNEL 100V - 0.14 Ω - 16A - TO-220 POWER MOS TRANSISTOR

TYPE	V _{DSS}	R _{D(on)}	I _D
STP16N10L	100 V	< 0.16 Ω	16 A

- TYPICAL R_{D(on)} = 0.14 Ω
- AVALANCHE RUGGED TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- HIGH CURRENT CAPABILITY
- 175°C OPERATING TEMPERATURE
- HIGH dV/dt RUGGEDNESS
- APPLICATION ORIENTED CHARACTERIZATION

APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- POWER MOTOR CONTROL
- DC-DC & DC-AC CONVERTERS
- SYNCRONOUS RECTIFICATION



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	16	A
I _D	Drain Current (continuous) at T _c = 100 °C	11	A
I _{DM(•)}	Drain Current (pulsed)	64	A
P _{tot}	Total Dissipation at T _c = 25 °C	90	W
	Derating Factor	0.4	W/°C
dV/dt(1)	Peak Diode Recovery voltage slope	0.6	V/ns
T _{stg}	Storage Temperature	-65 to 175	°C
T _j	Max. Operating Junction Temperature	175	°C

STP16N10L

THERMAL DATA

R _{thj-case}	Thermal Resistance Junction-case	Max	1.67	°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)	16	A
E _{AS}	Single Pulse Avalanche Energy (starting T _j = 25 °C, I _D = I _{AR} , V _{DD} = 50 V)	150	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	100			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} = ± 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 μA	1	1.7	2.5	V
R _{D(on)}	Static Drain-source On Resistance	V _{GS} = 5V I _D = 8 A V _{GS} = 10V I _D = 8 A		0.14 0.12	0.16 0.14	Ω Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} × R _{D(on)max} V _{GS} = 10 V	16			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 = 8 A	6.5	10		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0		800 150 50	1100 200 70	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	$V_{DD} = 50 \text{ V}$ $R_G = 4.7 \Omega$ $I_D = 8 \text{ A}$ $V_{GS} = 5 \text{ V}$		15 40	20 55	ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 80 \text{ V}$ $I_D = 16 \text{ A}$ $V_{GS} = 5 \text{ V}$		20 6 10	30	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(V_{off})}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{DD} = 80 \text{ V}$ $R_G = 4.7 \Omega$ $I_D = 16 \text{ A}$ $V_{GS} = 5 \text{ V}$		12 12 25	18 18 35	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)				16 64	A A
$V_{SD} (\ast)$	Forward On Voltage	$I_{SD} = 16 \text{ A}$ $V_{GS} = 0$			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 16 \text{ A}$ $di/dt = 100 \text{ A}/\mu\text{s}$ $V_{DD} = 30 \text{ V}$ $T_j = 150 \text{ }^\circ\text{C}$		145 580 8		ns μC A

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

(\bullet) Pulse width limited by safe operating area