

TSP90N20MC

200V N-Channel MOSFET

General Description

The TSP90N20MC uses advanced trench technology and design to provide excellent RDS(ON). These devices are well suited for high efficient switching mode power supplies and active power factor correction.

Product Summary

90A, 200V, Max.RDS(on)=25mΩ @ VGS =10V

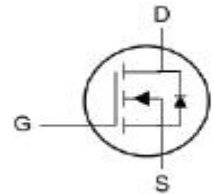
Applications

Uninterruptible power supplies
DC/DC converter
DC/AC inverter

Features

Fast switching
100% avalanche tested
Improve dv/dt capability
RoHS Compliant

TO-220 Pin Configuration



Absolute Maximum Ratings

Tc=25°C unless otherwise specified

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	200	V
V _{GS}	Gate-Source Voltage	±20	V
ID@TC=25°C	Continuous Drain Current	90	A
ID@TC=100°C	Continuous Drain Current	55	A
IDM	Pulsed Drain Current ¹	360	A
EAS	Single Pulse Avalanche Energy ²	1000	mJ
PD@TC=25°C	Total Power Dissipation	350	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating and Storage Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
RθJC	Thermal Resistance Junction-ambient	---	0.4	°C/W
RθJA	Thermal Resistance Junction-case	---	40	°C/W

Electrical Characteristics(T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	200	--	--	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 30A	--	--	25	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	--	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =160V , V _{GS} =0V	--	--	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V , V _{DS} =0V	--	--	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =20V, I _D =3A	--	13	--	S
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} = 0 V, f = 1MHz	--	6000	--	pF
C _{oss}	Output Capacitance		--	480	--	pF
C _{rss}	Reverse Transfer Capacitance		--	270	--	pF
t _{d(on)}	Turn-On Delay Time	V _{DD} =100V, I _D =60A R _L =1.66Ω R _G =1Ω V _{GS} =10V	--	15	--	ns
t _r	Rise Time		--	130	--	ns
t _{d(off)}	Turn-Off Delay Time		--	30	--	ns
t _f	Fall Time		--	90	--	ns
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	--	2	--	Ω
Q _g	Total Gate Charge	I _D =60A V _{DD} =100V V _{GS} =10V	--	60	--	nC
Q _{gs}	Gate-Source Charge		--	18	--	nC
Q _{gd}	Gate-Drain Charge		--	17	--	nC

Diode Characteristics

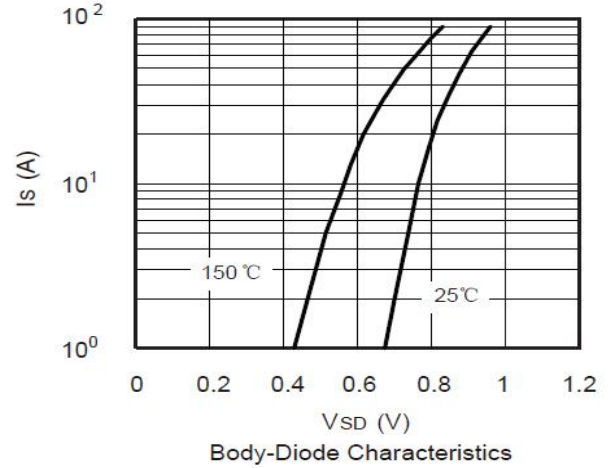
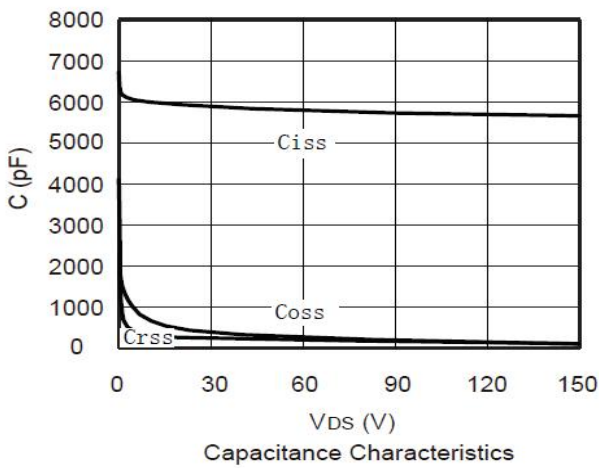
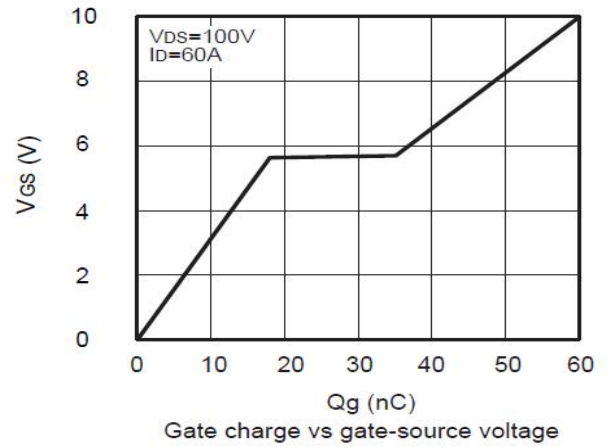
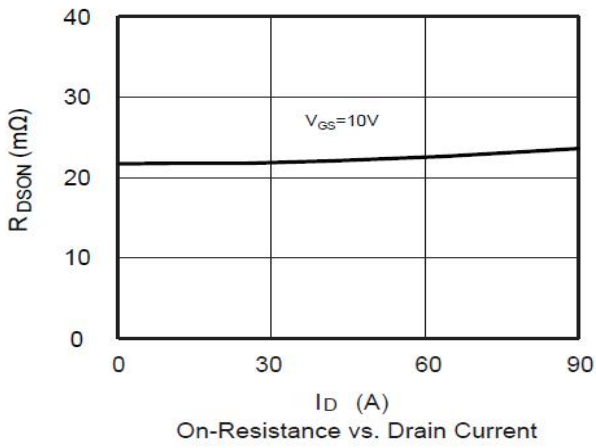
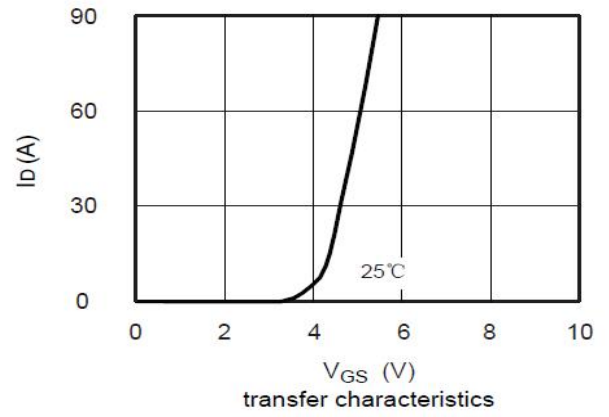
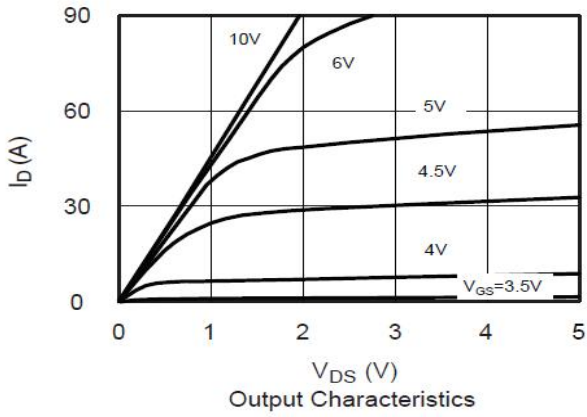
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	--	--	90	A
I _{SM}	Pulsed Source Current		--	--	360	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25℃	--	--	1.5	V

Note :

- 1.Repetitive rating; pulse width limited by maximum junction temperature.
- 2.The test condition is V_{DD}=50V,V_{GS}=10V,L=1mH,I_{AS}=45A.

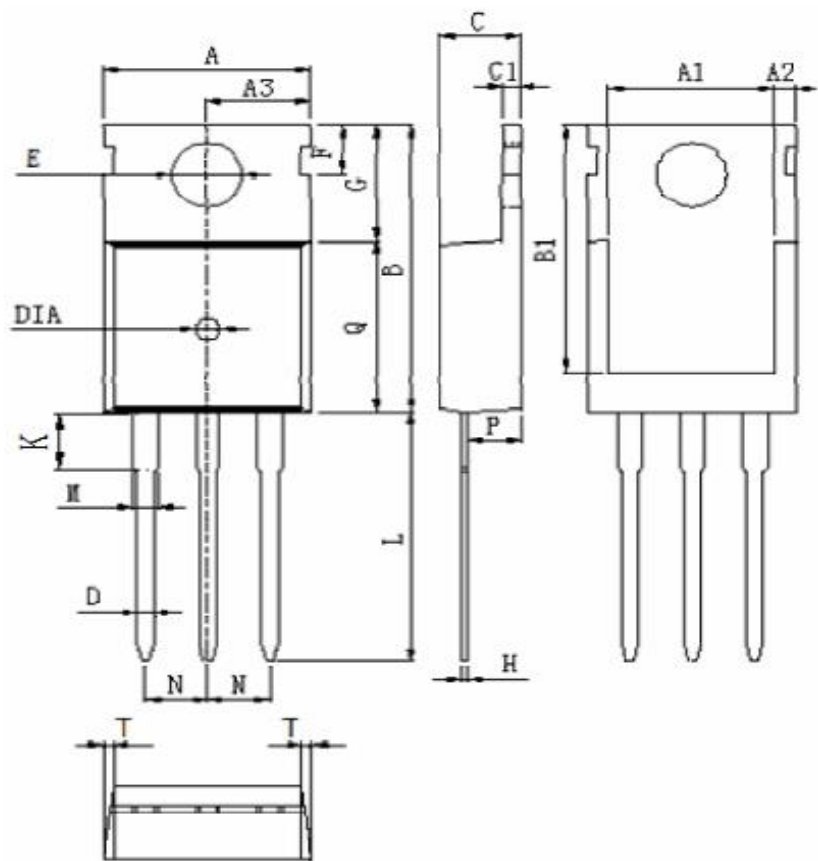
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Typical Characteristics



Package Dimension

TO-220 Unit :mm



DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.48±0.2
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	5.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
L1	3.0±0.3
M	1.25±0.1
N	2.54±0.05
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5(deep 0.2)