

100V N-Channel Super Gate Trench Power MOSFET

FEATURES

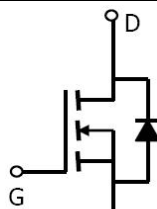
- Super TrenchFET® Power MOSFET
- 100% avalanche tested
- Improved dv/dt capability

APPLICATIONS

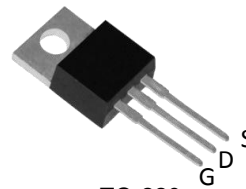
- Primary Side Switch
- Other Applications
- Uninterruptible power supply

Parameter Summary

VDS: 100V **ID** (at VGS=10V) : 135A **Rds(on)** (at VGS=10V) : 4.4mΩ(Max.)



Symbol



TO-220

SS044N10AP

Device Ordering Marking Packing Information

Ordering Number	Package	Marking	Packing
SS044N10AP	TO-220	YZPST SS044N10AP	Tube



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
		TO-220	
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DS}	100	V
Continuous Drain Current	I_D	135	A
Pulsed Drain Current (note1)	I_{DM}	520	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	780	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	208	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Resistance

Parameter	Symbol	Value	Unit
		TO-220	
Thermal Resistance, Junction-to-Case	R_{thJC}	0.60	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	

Specifications T _J = 25°C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100, V _{GS} = 0V, T _J = 25°C	--	--	1.0	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = 250μA	2.0	--	4.0	V
Drain-Source On-Resistance (Note3)	R _{DS(on)}	V _{GS} = 10V, I _D =50A	--	3.6	4.4	mΩ
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1.0MHz	--	7300	--	pF
Output Capacitance	C _{oss}		--	850	--	
Reverse Transfer Capacitance	C _{rss}		--	25	--	
Total Gate Charge	Q _g	V _{DD} = 50V, I _D = 20A, V _{GS} = 10V	--	114	--	nC
Gate-Source Charge	Q _{gs}		--	37	--	
Gate-Drain Charge	Q _{gd}		--	26	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 50V, I _D =50A,V _{GS} = 10V R _G =3.0 Ω	--	32	--	ns
Turn-on Rise Time	t _r		--	50	--	
Turn-off Delay Time	t _{d(off)}		--	83	--	
Turn-off Fall Time	t _f		--	30	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25 °C	--	--	135	A
Pulsed Diode Forward Current	I _{SM}		--	--	520	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 50A, V _{GS} = 0V	--	0.9	1.2	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0V,I _S = 50A, di _F /dt =500A /μs	--	75	--	ns
Reverse Recovery Charge	Q _{rr}		--	160	--	nC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $V_{DD} = 50V, R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

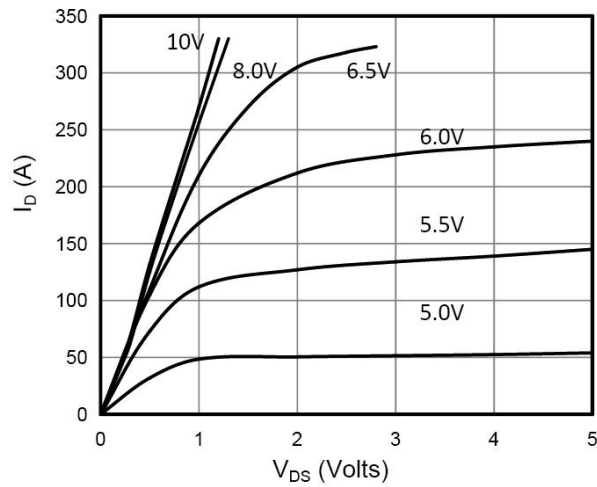


Figure 1: On-Region Characteristics

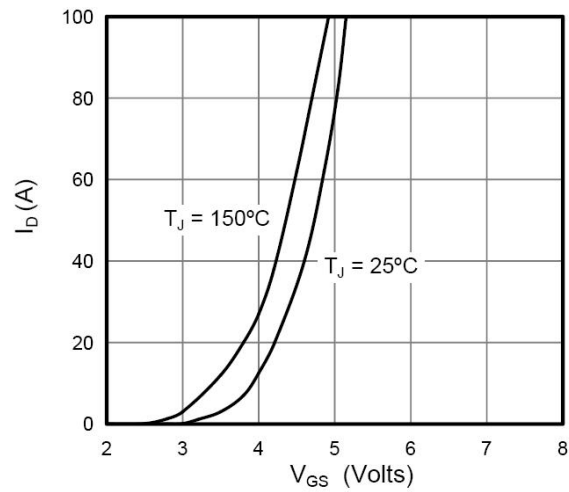


Figure 2: Transfer Characteristics

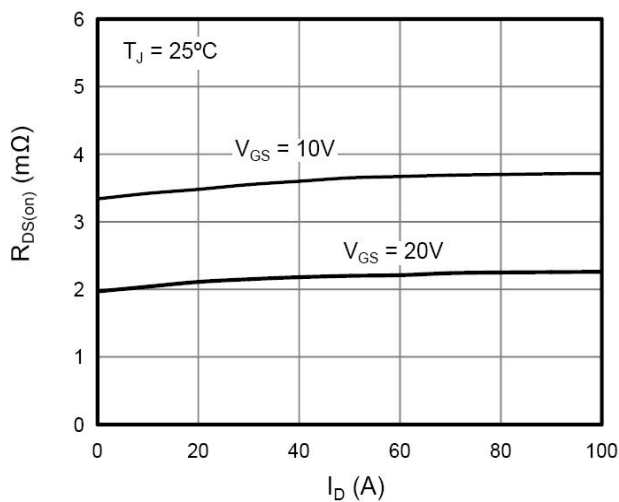


Figure 3: On-Resistance vs. Drain Current

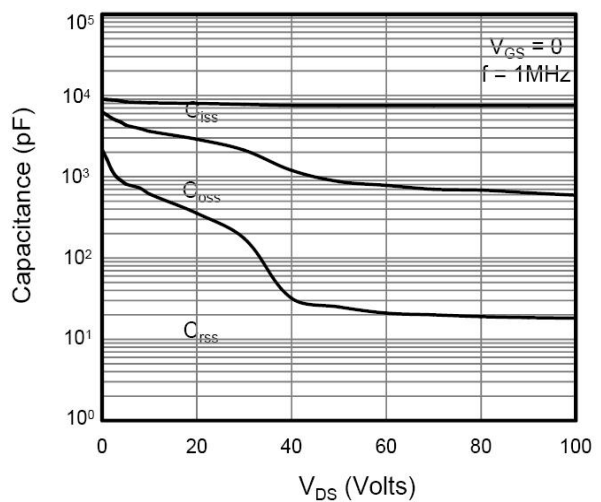


Figure 4: Capacitance Characteristics

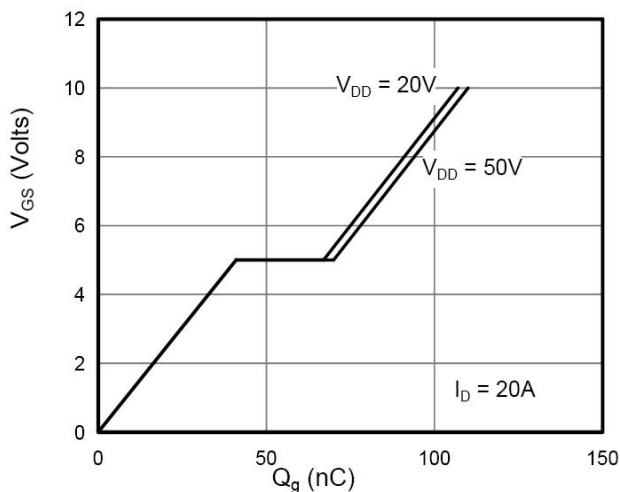


Figure 5: Gate Charge Characteristics

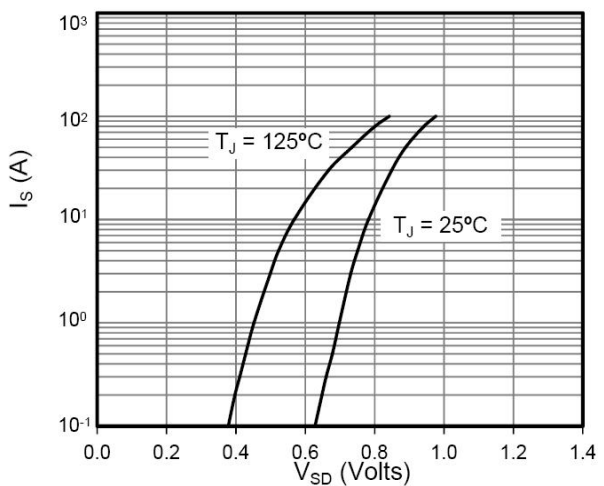


Figure 6: Body Diode Forward Voltage

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

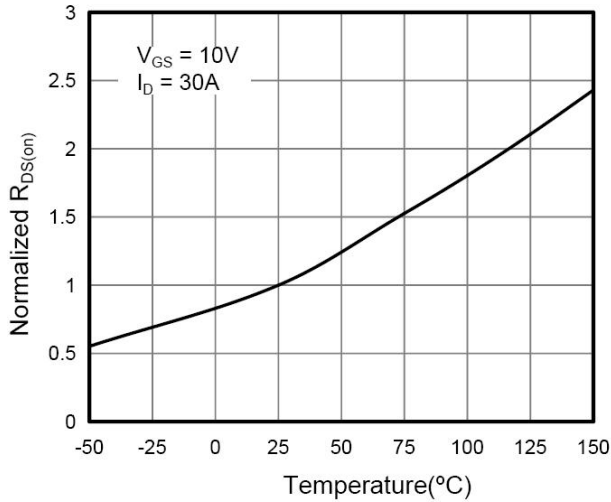


Figure 7: On-Resistance vs. Junction Temperature

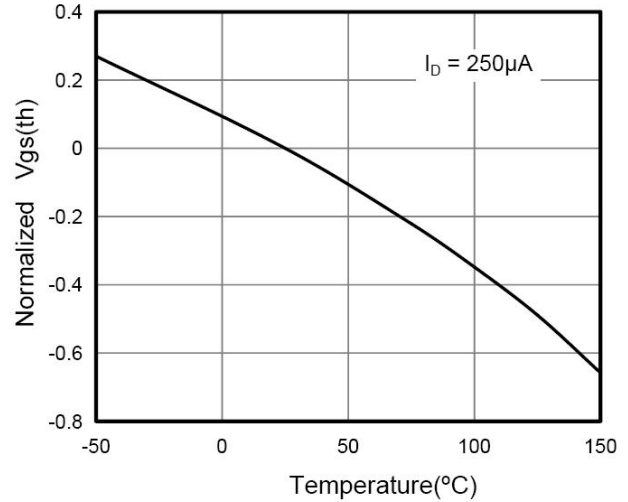


Figure 8: $V_{GS(th)}$ vs. Junction Temperature

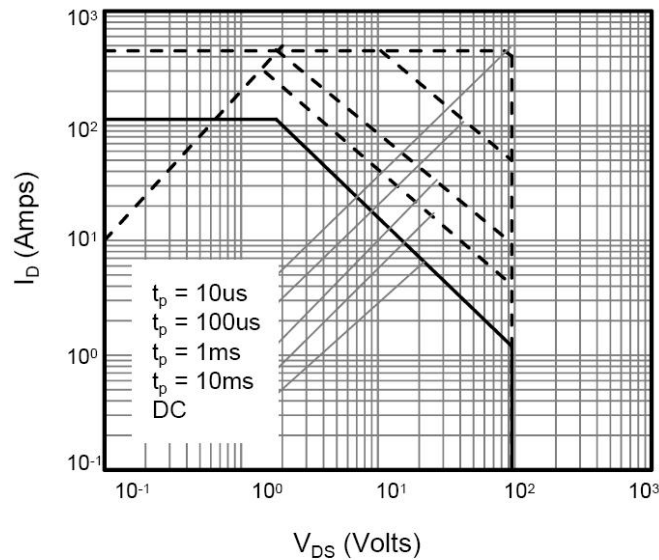


Figure 10: Safe Operating Area

TEST CIRCUITS AND WAVEFORMS

Figure A: Gate Charge Test Circuit and Waveform

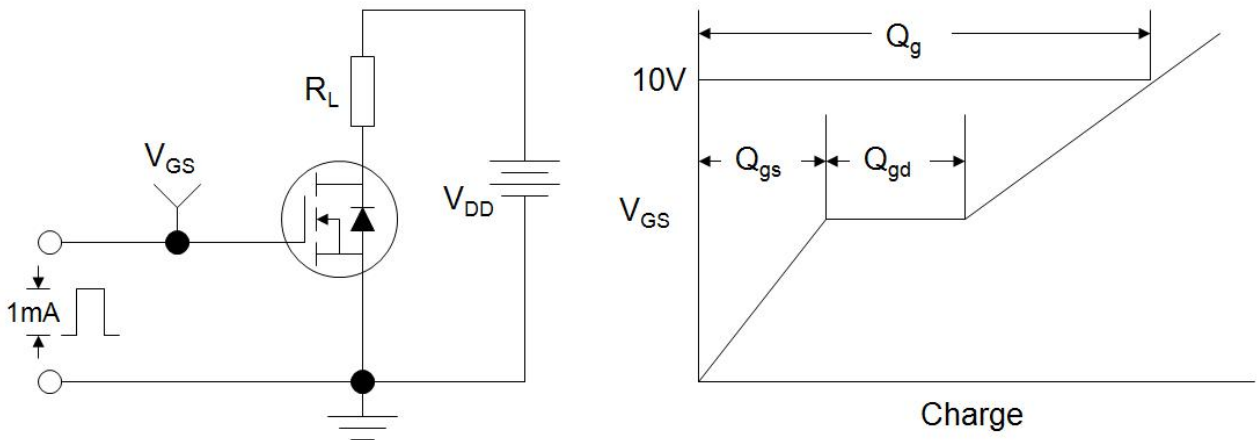


Figure B: Resistive Switching Test Circuit and Waveform

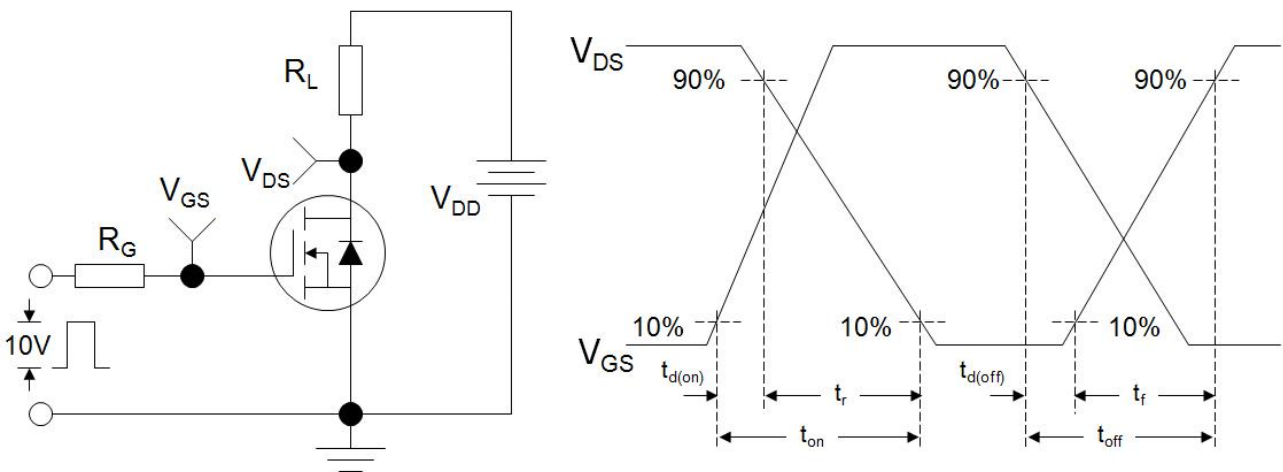


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

