

UN200N23TE

N-Channel Enhancement Mode MOSFET

ROHS



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Product Summary

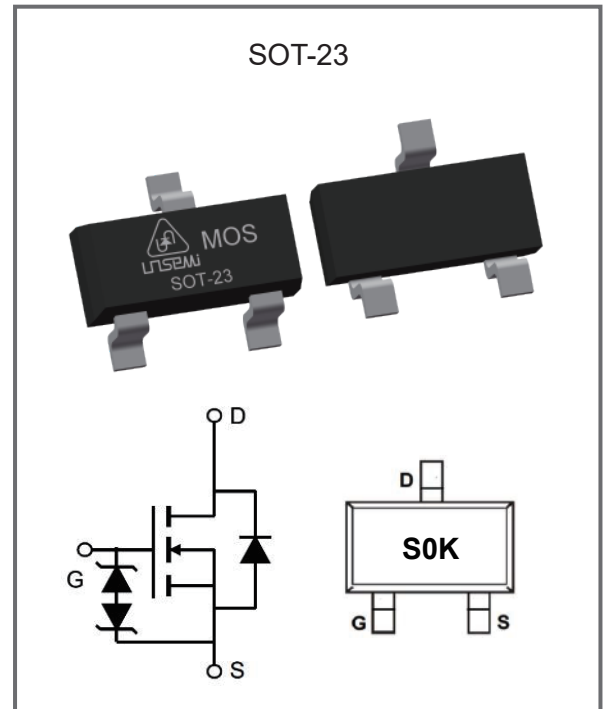
V _{DS}	20V
I _D	5A
R _{DS(ON)} (@V _{GS} =4.5V I _D =5A)	≤19mΩ
R _{DS(ON)} (@V _{GS} =2.5V I _D =3A)	≤30mΩ

Feature

- ◆ Advanced Trench Process Technology
- ◆ Low Threshold Voltage
- ◆ Fast Switching Speed
- ◆ Halogen-Free & Lead-Free
- ◆ ESD Protected up to 2KV (HBM)

Applications

- ◆ Load Switch for Portable Devices
- ◆ Voltage controlled small signal switch



Package Marking And Ordering information

Part Number	Package Type	Packaging	Reel(pcs)
UN200N23TE	SOT-23	Tape & Reel	3000

Absolute Maximum Ratings TA = 25°C unless otherwise specified

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	20	V
Gate- Source Voltage	V _{GS}	±12	V
Continuous drain current	I _D	5	A
Peak Drain Current, Pulsed ¹⁾	I _{DM}	20	A
Power Dissipation ²⁾	P _{tot}	1.25	W
Operating Junction	T _J	-55~150	°C
Storage Temperature Range	T _{stg}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Max	Units
Thermal Resistance from Junction to Ambient ²⁾	R _{θJA}	100	°C/W

Note :

1) Pulse width ≤300us, duty cycle ≤0.5%, limited by T_{jmax}

2) Device mounted on FR-4 substrate PC board, 2ozcopper, with 1-inch square copper plate in still air.

Electrical Characteristics at TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V , ID = 250μA	20			V
Drain-Source Leakage Current	IDSS	VDS = 20V			1.0	μA
Gate Leakage Current	IGSS	VGS = ±12V			±10	μA
Gate-Source Threshold Voltage	VGS(TH)	VGS = VDS , ID = 250μA	0.4	0.7	1.0	V
Drain-Source On-State Resistance	RDS(ON)	VGS = 4.5V , ID = 5A		17	19	mΩ
		VGS = 2.5V , ID = 3A		24	30	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	Ciss	VGS = 0V VDS = 10V F = 1MHz		545		pF
Output Capacitance	Coss			103		pF
Reverse Transfer Capacitance	Crss			90		pF
Gate charge total	Qg	VDS = 10V, IDS = 5A, VGS = 4.5V		8		nC
Gate to Source Charge	Qgs			2.5		nC
Gate to Drain Charge	Qgd			3		nC
Turn-On Delay Time	td(ON)	VDS = 10V, VGS = 5V, RL = 1.5Ω, RG = 3Ω		0.5		nC
Turn-On Rise Time	tr			1		ns
Turn-Off Delay Time	td(OFF)			12		ns
Turn-Off Fall Time	tf			4		ns
Body-Diode PARAMETERS						
Drain-Source Diode Forward Voltage	VDS	IS = 5A, VGS = 0V		0.8	1.2	V

Electrical Characteristics Curves

Fig 1: Output Characteristics

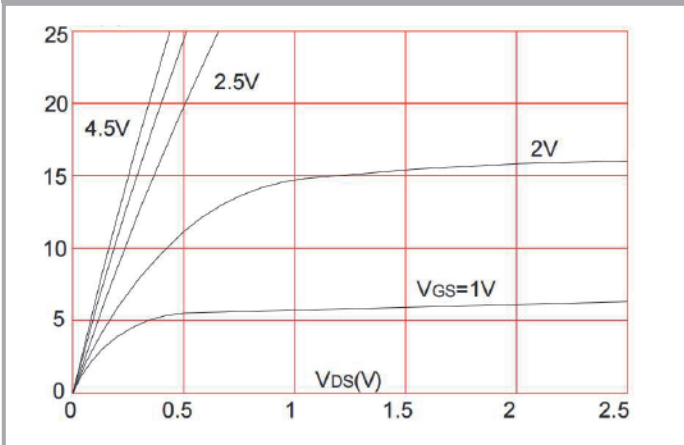


Fig 2: Typical Transfer Characteristics

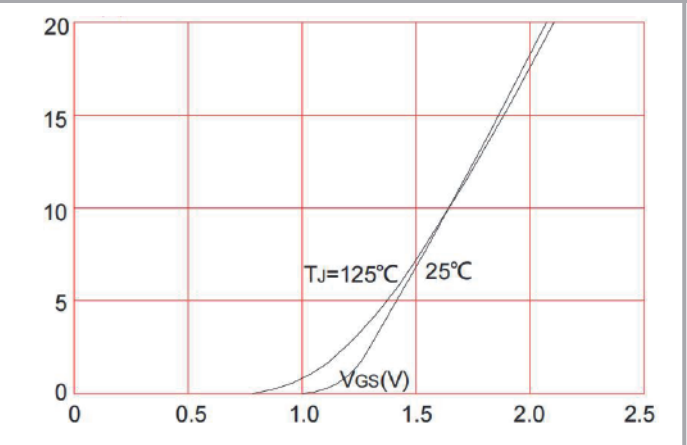


Figure 3: On-resistance vs. Drain Current
 $R_{DS(ON)}$ (m Ω)

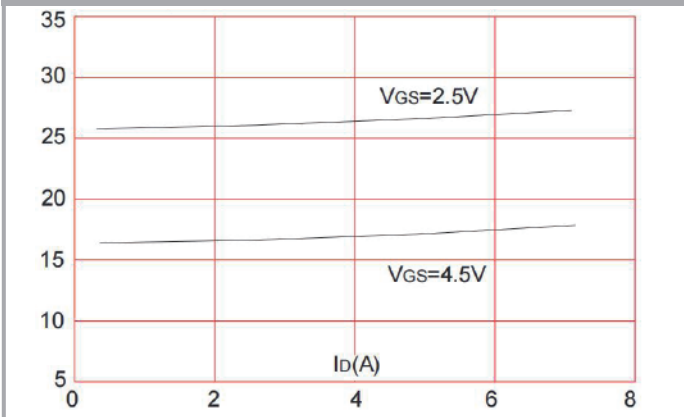


Figure 4: Body Diode Characteristics I_S (A)

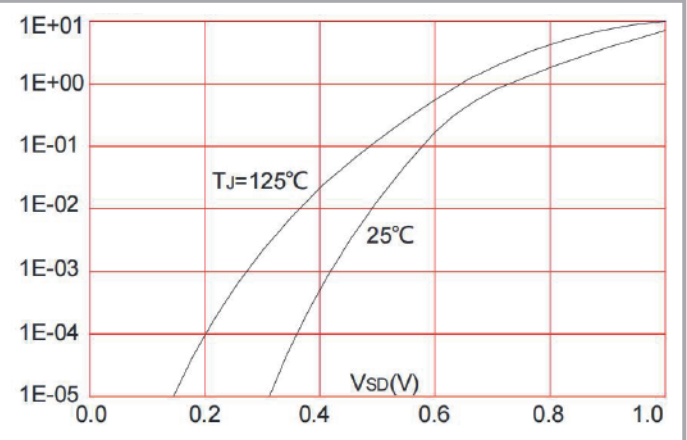


Figure 5: Body Diode Characteristics V_{GS} (V)

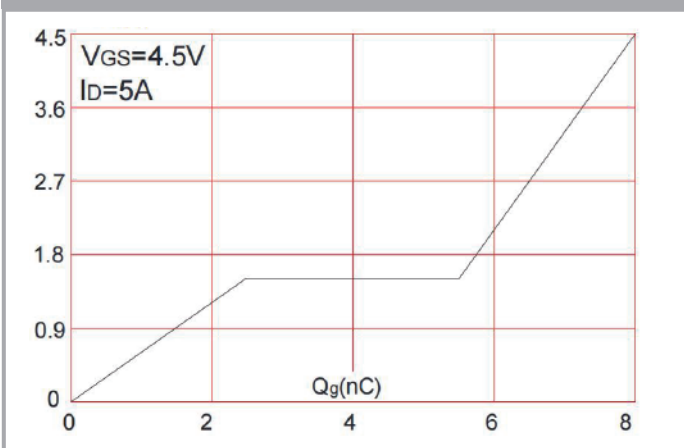
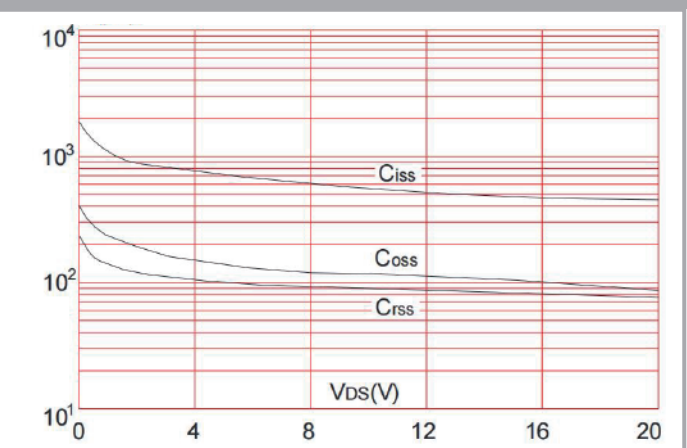


Figure 6: Capacitance Characteristics C(PF)



Electrical Characteristics Curves

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

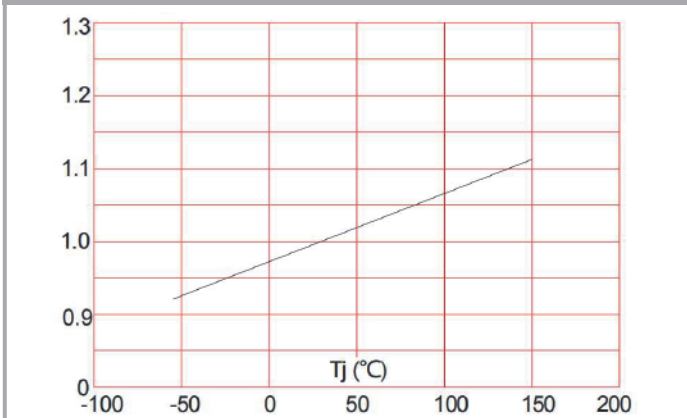


Figure 8: Normalized on Resistance Vs. Junction Temperature

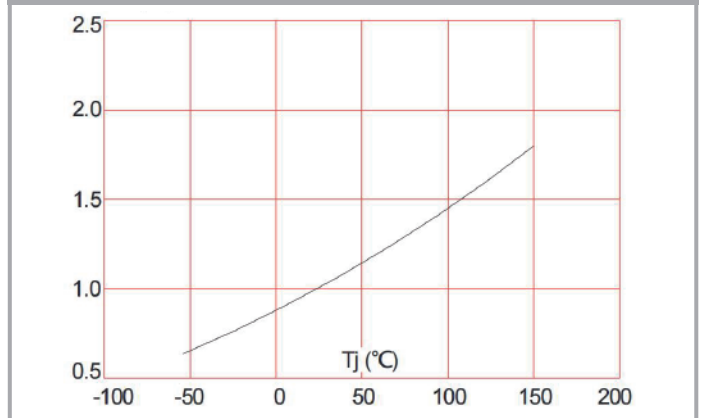


Figure 9: Maximum Safe Operating Area

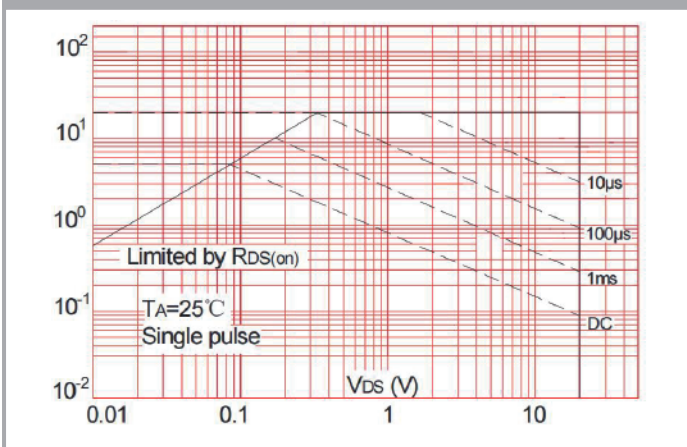


Figure 10: Maximum Continuous Drain Current Vs. Ambient Temperature

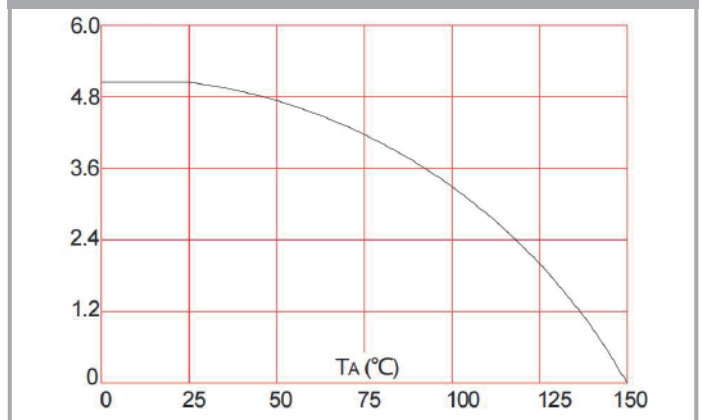
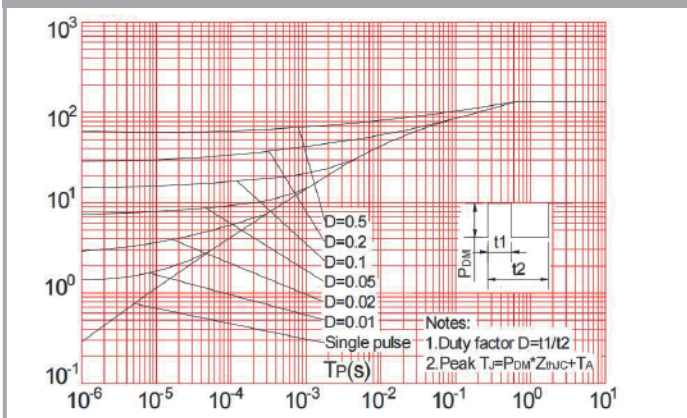


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to Ambient



Test Circuit

Fig.1-1 Switching times test circuit

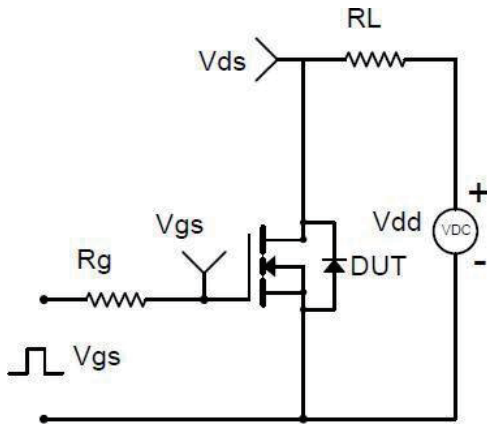


Fig.1-2 Switching Waveform

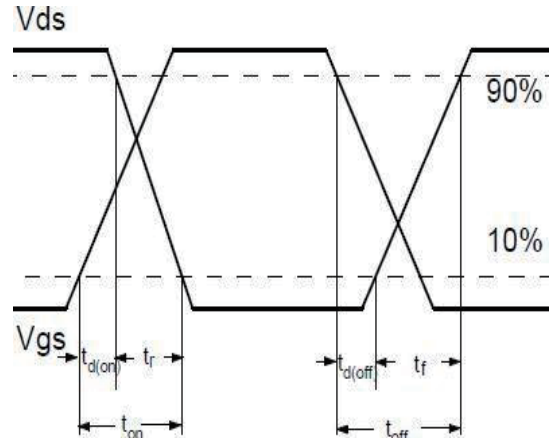


Fig.2-1 Gate charge test circuit

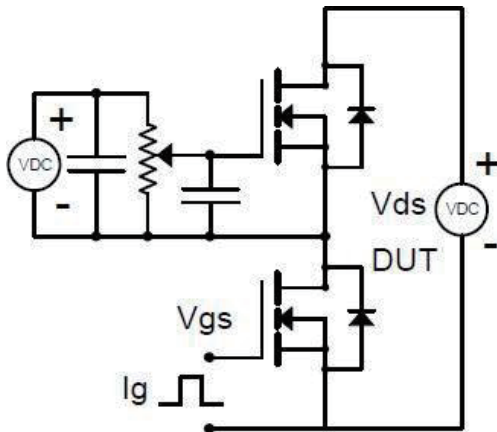


Fig.2-2 Gate charge waveform

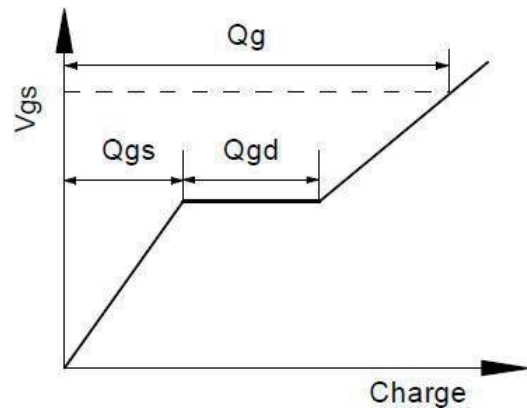


Fig.3-1 Avalanche test circuit

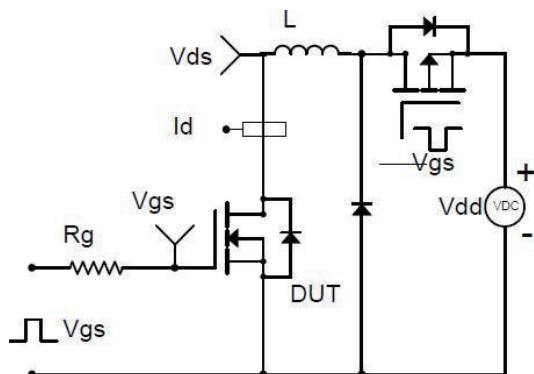
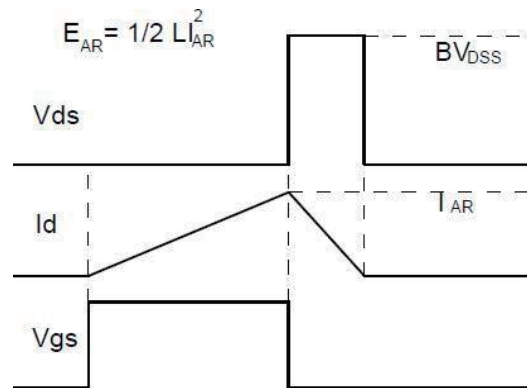
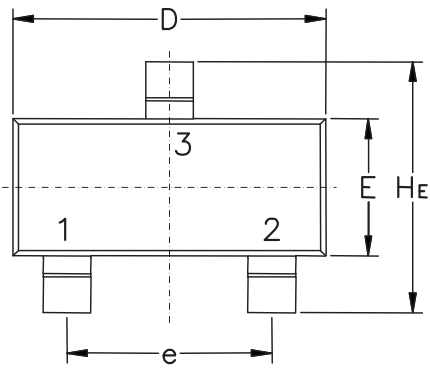


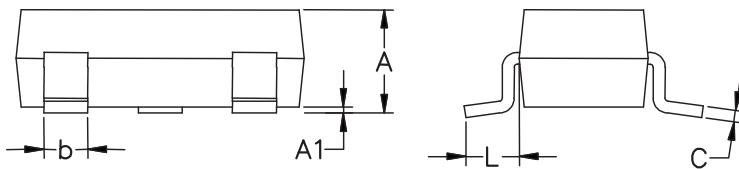
Fig.3-2 Avalanche waveform



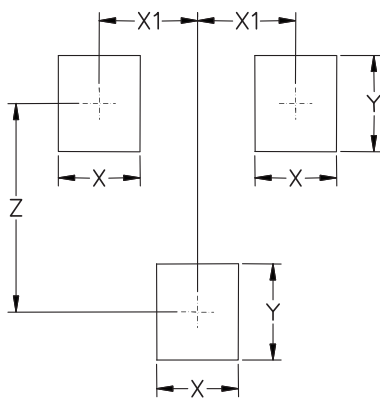
SOT-23 Package Outline & Dimensions (Units: mm / in)



Symbol	Millimeters			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
C	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104



Soldering Footprint



Symbol	Millimeters	Inches
X	0.80	0.031
X1	0.96	0.037
Y	0.90	0.035
Z	2.00	0.079

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