UN215P23TE

ROHS

P-Channel Enhancement Mode MOSFET

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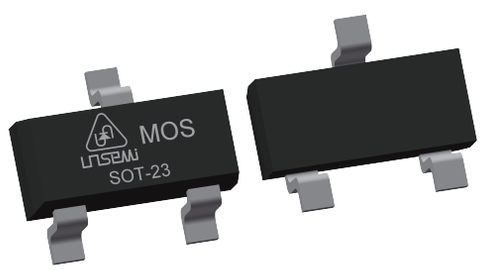
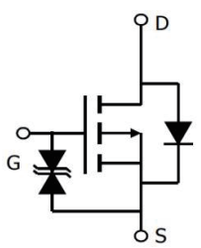
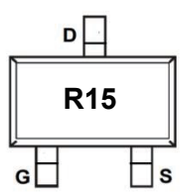
Product Summary

V_{DS}	-20V
I_D	-4A
$R_{DS(ON)}$(@V_{GS}=-4.5V I_D=-4.0A)	≤50mΩ
$R_{DS(ON)}$(@V_{GS}=-2.5V I_D=-4.0A)	≤60mΩ

SOT-23







Features

- ◆ 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)
UN215P23TE	SOT-23	Tape & Reel	3000

Absolute Maximum Ratings T_A = 25℃ unless otherwise specified

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate- Source Voltage	V_{GS}	±10	V
Continuous drain current	I_D	-4	A
Peak Drain Current, Pulsed [1)]	I_{DM}	-30	A
Power Dissipation [2)]	P_{tot}	1.25	W
Operating Junction	T_J	-55~150	℃
Storage Temperature Range	Tstg	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max	Units
Thermal Resistance from Junction to Ambient [2)]	$R_{\theta JA}$	100	℃/W

Note:

1）Pulse width ≤100us,duty cycle ≤1%,limite by Tjmax.

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

Electrical Characteristics at T_A = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = -250μA	-20			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} = -20V			-1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±10V			±10	μA
Gate-Source Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_D = -250μA	-0.4		-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = -4.5V , I_D = -4.0A		28	50	mΩ
		V_{GS} = -2.5V , I_D = -4.0A		38	60	mΩ
Body-Diode PARAMETERS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S = -1A, V_{GS} = 0V			-1	V
Body Diode Reverse Recovery Time	trr	I_S = -4A, di/dt = 500A /μs		26		ns
Body Diode Reverse Recovery Charge	Qrr			51		nC
DYNAMIC PARAMETERS						
Gate Resistance	R_G	V_{DS} = 0V, F = 1MHz			20	Ω
Forward Transconductance	gts	V_{DS} = -5V, I_D = -4A		20		S
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = -10V, F = 1MHz		751		pF
Output Capacitance	Coss			115		pF
Reverse Transfer Capacitance	Crss			80		pF
Gate charge total	Qg	V_{DS} = -10V, V_{GS} = -4.5V, I_D = -4A		9.3		nC
Gate to Source Charge	Qgs			1.0		nC
Gate to Drain Charge	Qgd			2.2		nC
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = -4.5V, V_{DS} = -10V, R_L = 2.5Ω, R_G = 3Ω		13		ns
Turn-On Rise Time	tr			9		ns
Turn-Off Delay Time	$t_{d(OFF)}$			19		ns
Turn-Off Fall Time	tf			29		ns

Electrical Characteristics Curves

Fig 1: On-Region Characteristics (Note E)

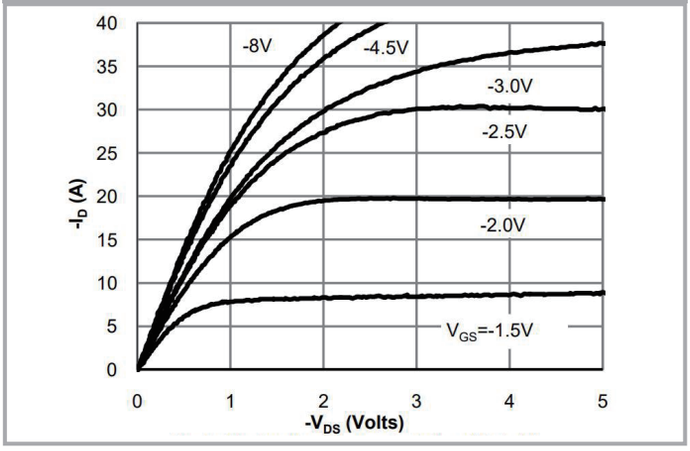


Fig 2: Transfer Characteristic (Note E)

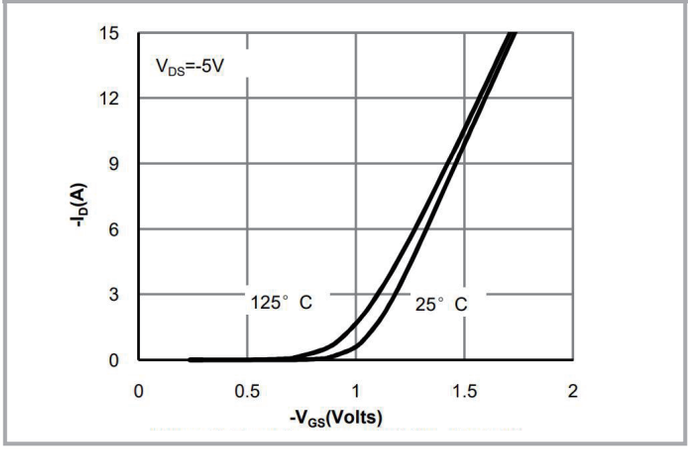


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

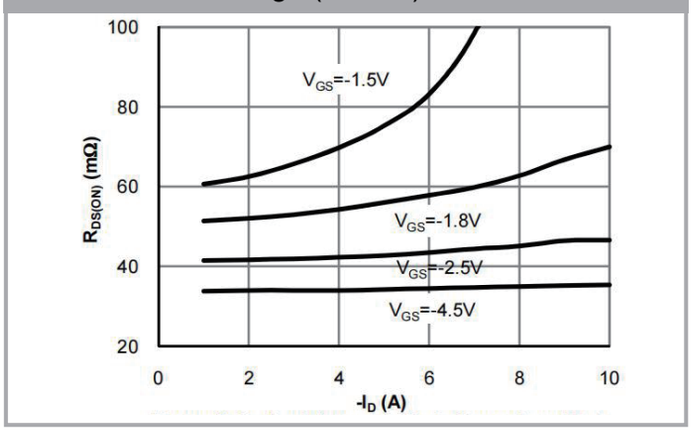


Figure 4: On-Resistance vs. Junction Temperature (Note E)

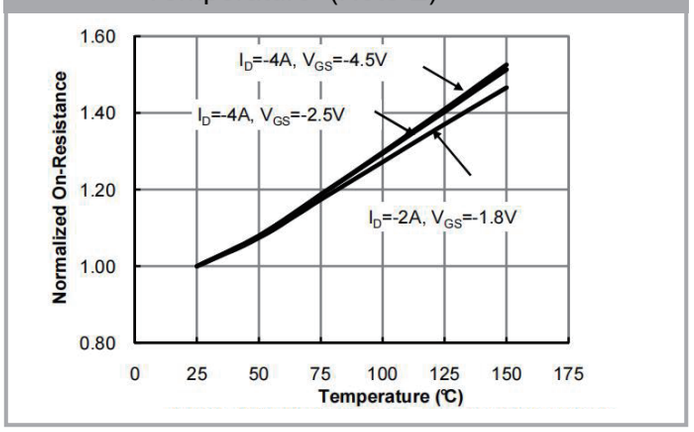


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

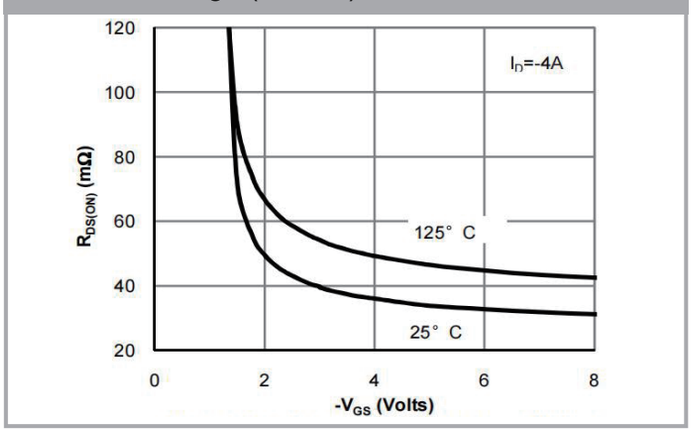
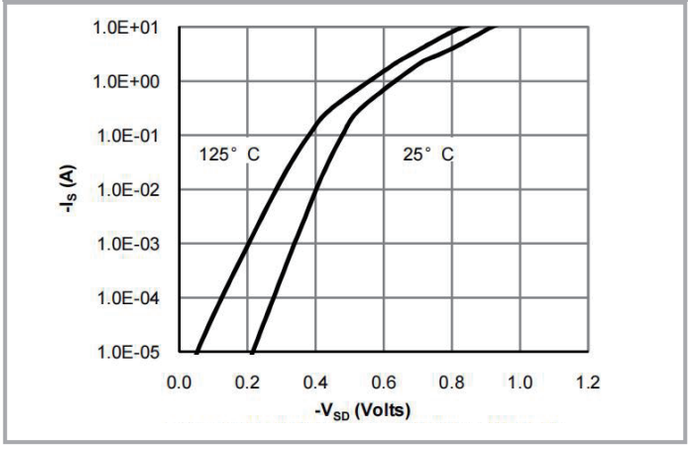


Figure 6: Body-Diode Characteristics (Note E)



Electrical Characteristics Curves

Figure 7: Gate-Charge Characteristics

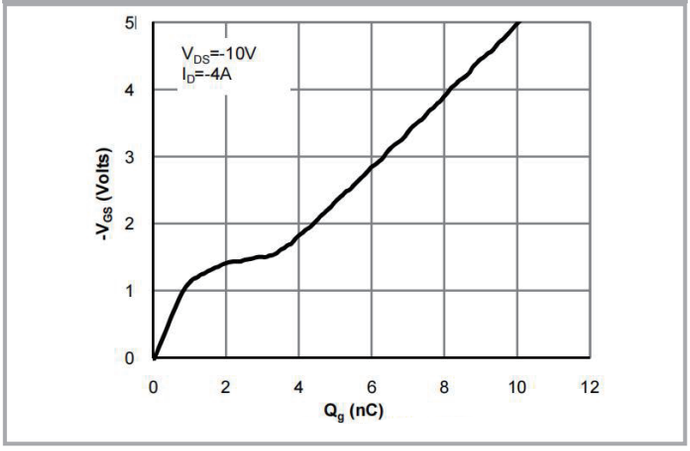


Figure 8: Capacitance Characteristics

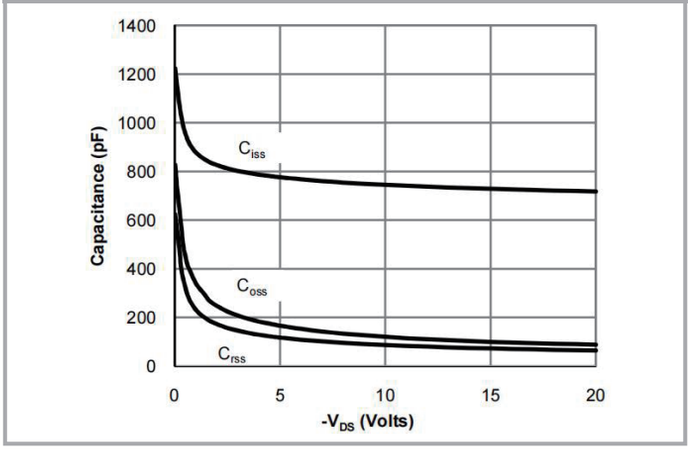


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

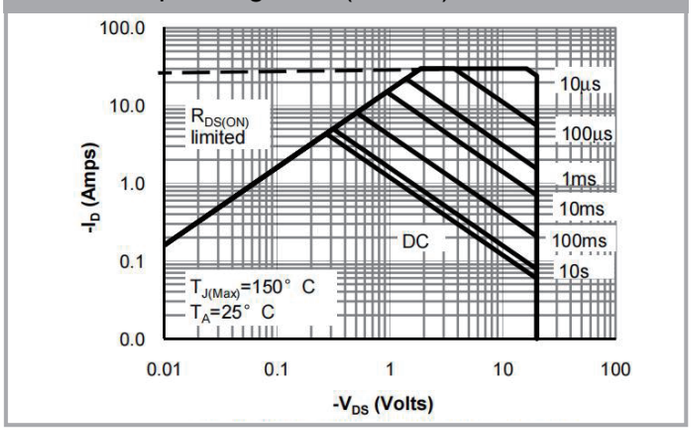


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

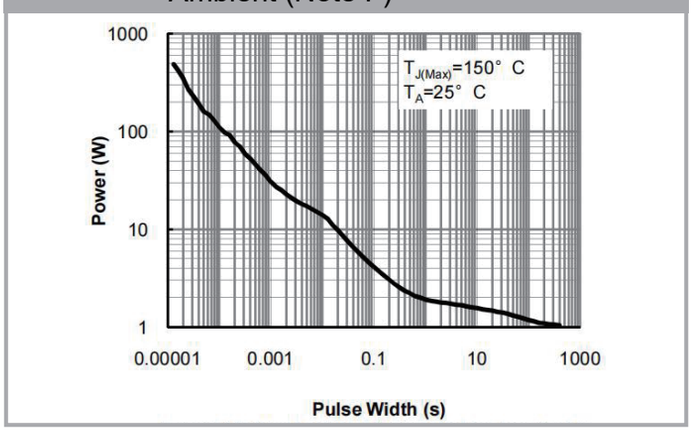
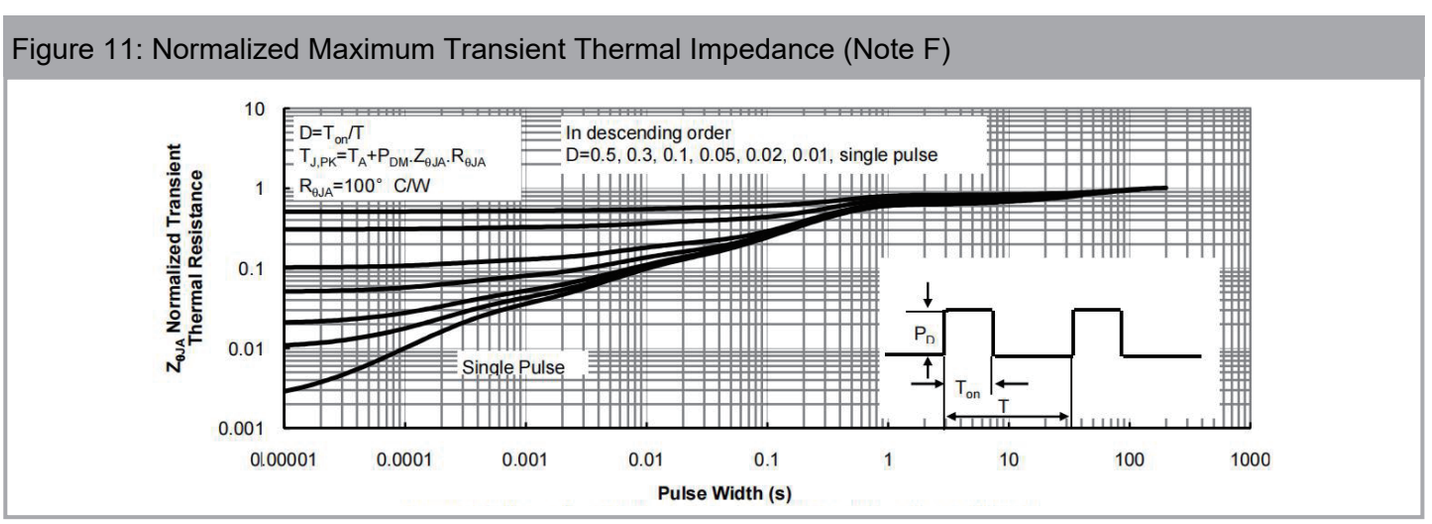


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



Test Circuit

Fig.1-1 Switching times test circuit

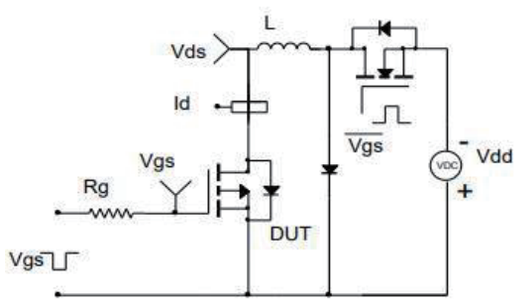


Fig.1-2 Switching Waveform

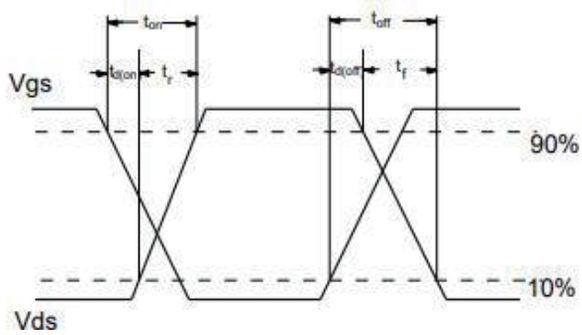


Fig.2-1 Gate charge test circuit

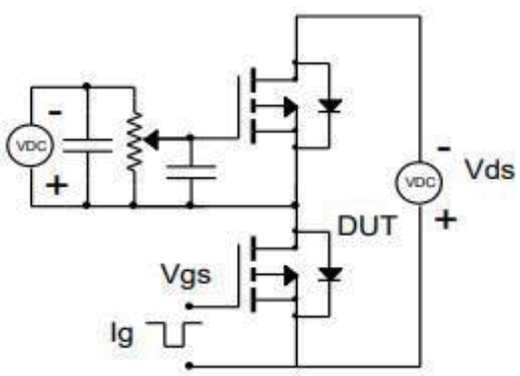


Fig.2-2 Gate charge waveform

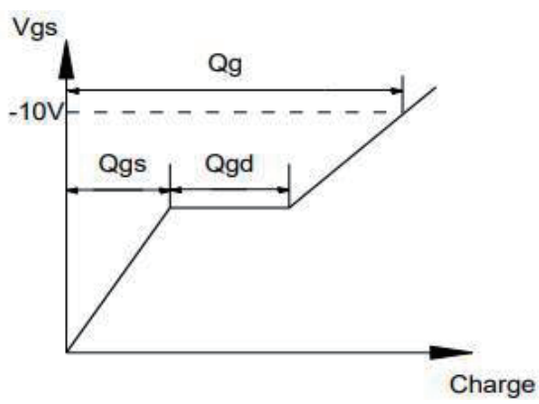


Fig.3-1 Avalanche test circuit

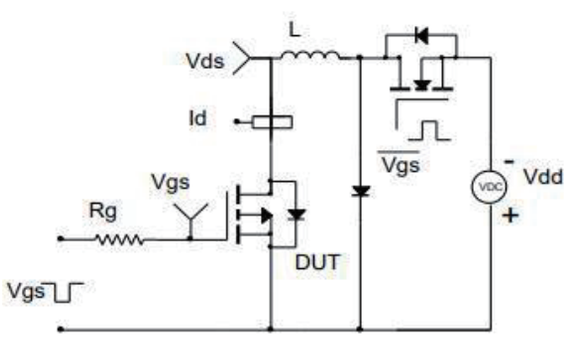
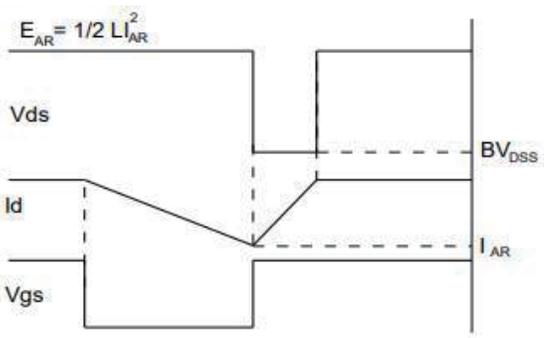
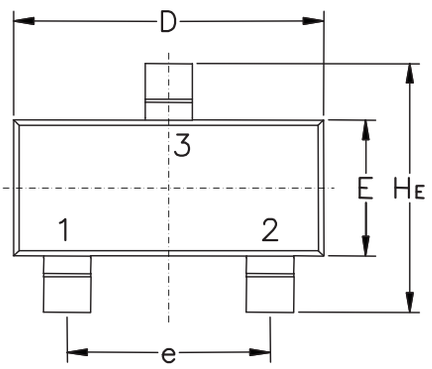


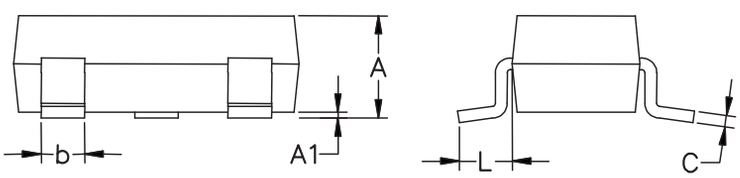
Fig.3-2 Avalanche waveform



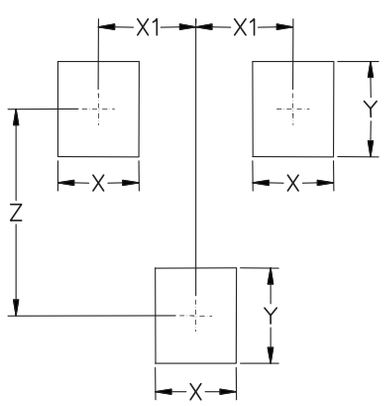
SOT-23 Package Outine & Dimensions (Units: mm / in)



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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