UN205P23T

ROHS

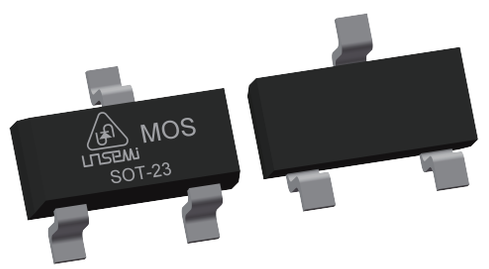
P-Channel Enhancement Mode MOSFET

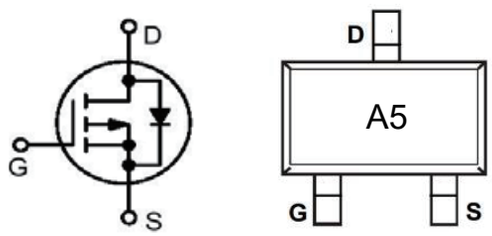
www.unsemi.com.tw

Product Summary

V_{DS}	-20V
I_D	-4.1A
$R_{DS(ON)}$(@V_{GS}=-4.5V I_D =-4.1A)	≤52mΩ
$R_{DS(ON)}$(@V_{GS}=-2.5V I_D =-3A)	≤75mΩ

SOT-23





Features

- ◆ Advanced Trench Process Technology
- ◆ Low Threshold Voltage
- ◆ Fast Switching Speed
- ◆ Halogen-Free & Lead-Free

Applications

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

Package Marking And Ordering information

Part Number	Package Type	Packaging	Reel(pcs)
UN205P23T	SOT-23	Tape & Reel	3000

Absolute Maximum Ratings TA = 25℃ 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	-4.1	A
Peak Drain Current, Pulsed [1]		I_{DM}	-15	A
Maximum Power Dissipation [2]	T_A = 25℃	P_D	1.25	W
	T_A = 75℃		0.8	W
Operating Junction and Storage Temperature Range		T_J,Tstg	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max	Units
Junction-to-Ambient Thermal Resistance (PCB mounted) [2]	$R_{\theta JA}$	100	℃/W
Junction-to-Ambient Thermal Resistance (PCB mounted) [3]	$R_{\theta JA}$	166	℃/W

Notes

1) Pulse width limited by maximum junction temperature.

2) Surface Mounted on FR4 Board,t≤5 sec.

3) Surface Mounted on FR4 Board.

Electrical Characteristics at TA = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions		Min	Typ	Max	Units
STATIC PARAMETERS							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = -250μA		-20			V
Zero Gate Voltage Drain Current 0	I_{DSS}	V_{DS} = -20V V_{GS} = 0V				-1	μA
			T_J=55℃			-10	μA
Gate Body Leakage	I_{GSS}	V_{GS} = ±12V , V_{DS} = 0V				±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_D = -250μA		-0.4		-1.0	V
Drain-Source On-State Resistance [1]	$R_{DS(ON)}$	V_{GS} = -4.5V , I_D = -4.1A			46	52	mΩ
		V_{GS} = -2.5V , I_D = -3.0A			60	75	mΩ
Source-Diode PARAMETERS							
Max. Diode Forward Current	I_S					-1.6	A
Diode Forward Voltage	V_{SD}	I_S = -1.6A, V_{GS} = 0V			-0.8	-1.2	V
DYNAMIC PARAMETERS							
Forward Transconductance [1]	gts	V_{DS} = -5V, I_D = -3.5A			6.5		S
Input Capacitance	Ciss	V_{GS} = 0V V_{DS} = -6V F = 1MHz			415		pF
Output Capacitance	Coss				223		pF
Reverse Transfer Capacitance	Crss				87		pF
Gate charge total	Qg	V_{DS} = -6V, V_{GS} = -4.5V, I_D = -3.5A			5.8		nC
Gate to Source Charge	Qgs				0.85		nC
Gate to Drain Charge	Qgd				1.7		nC
Turn-On Delay Time	$td_{(ON)}$	V_{GED} = -4.5V, V_{DD} = -6V I_D = -1A , R_G = 6Ω R_L = 6Ω			13		ns
Turn-On Rise Time	tr				36		ns
Turn-Off Delay Time	$td_{(OFF)}$				42		ns
Turn-Off Fall Time	tf				34		ns

Notes

1) Pulse test: pulse width <= 300us, duty cycle<= 2%

Electrical Characteristics Curves

Fig 1: Power Dissipation

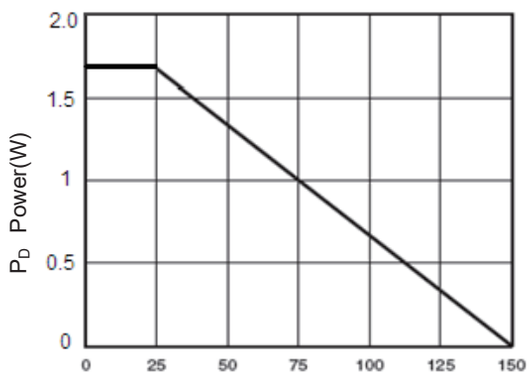


Fig 2: Drain Current

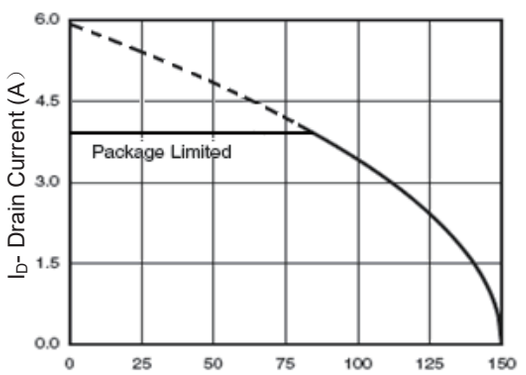


Figure 3: Output Characteristics

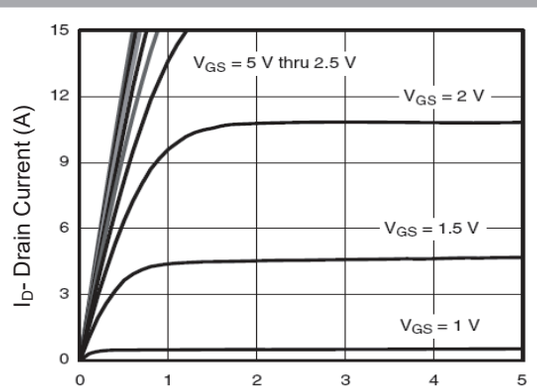


Figure 4: Drain-Source On-Resistance

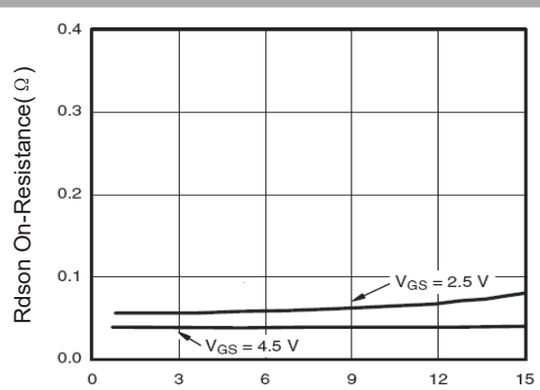


Figure 5: Transfer Characteristics

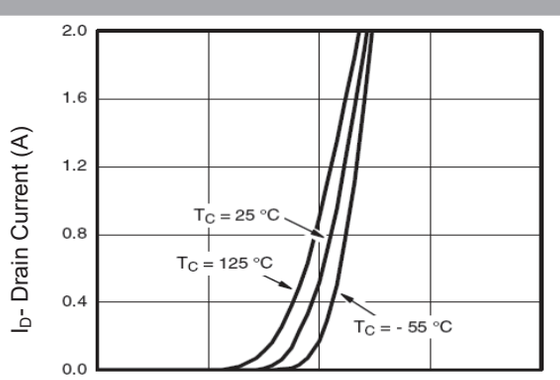
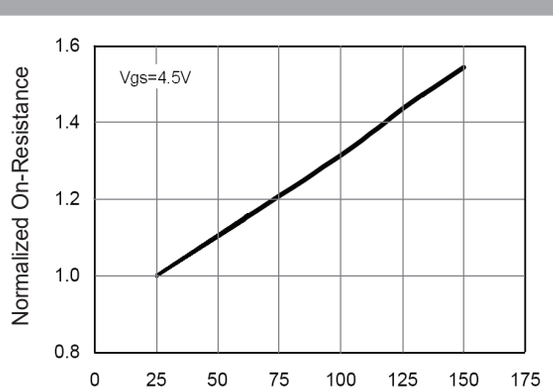


Figure 6: Drain-Source On-Resistance



Electrical Characteristics Curves

Figure 7: Rdson vs Vgs

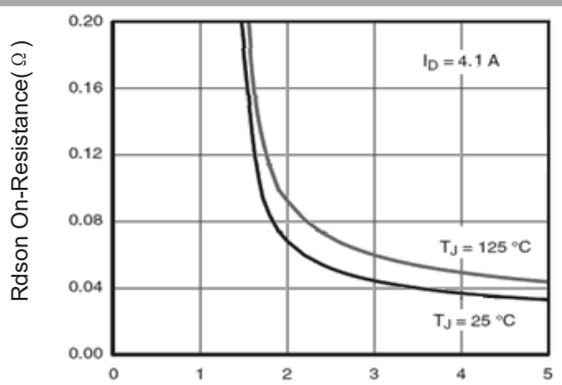


Figure 8: Capacitance vs VDS

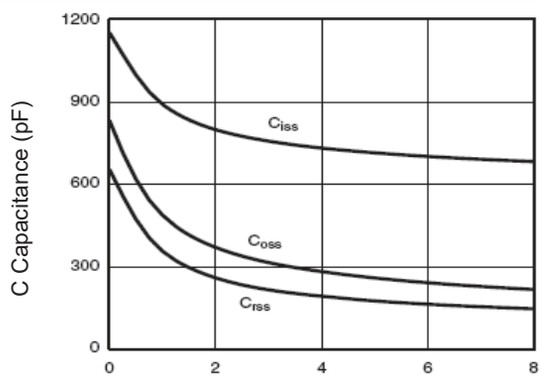


Figure 9: Gate Charge

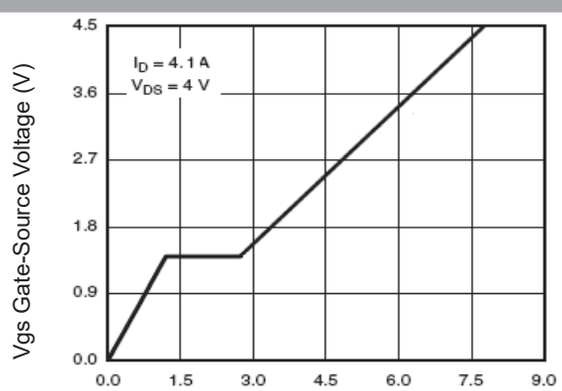


Figure 10: Source- Drain Diode Forward

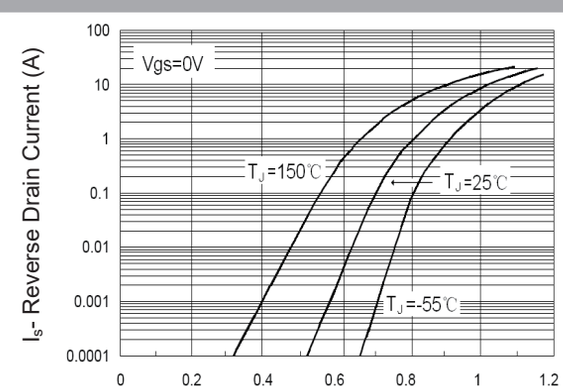
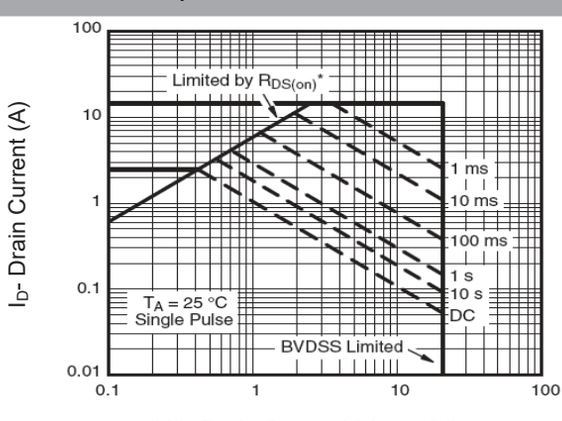
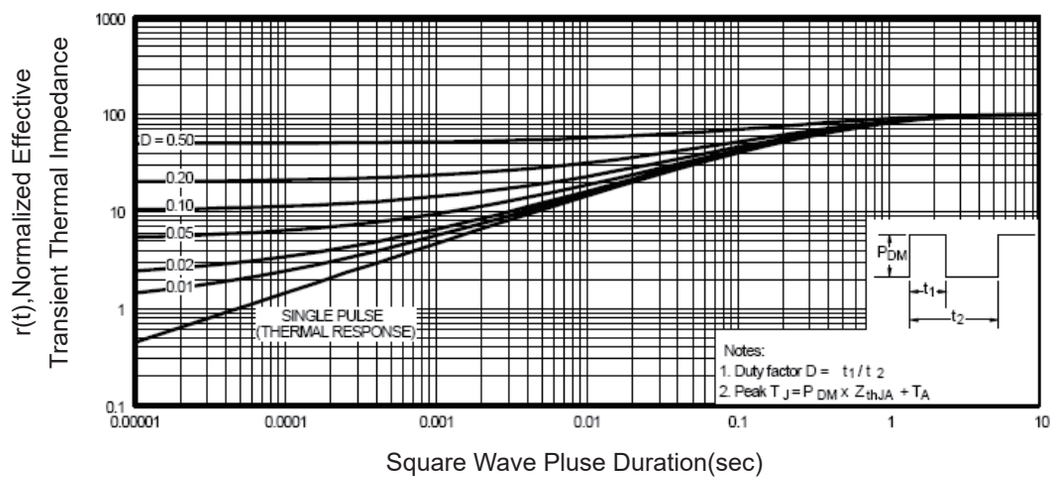


Figure 11: Safe Operation Area



Electrical Characteristics Curves

Figure 12: Normalized Maximum Transient Thermal Impedance



Test Circuit

Fig.1-1 Switching times test circuit

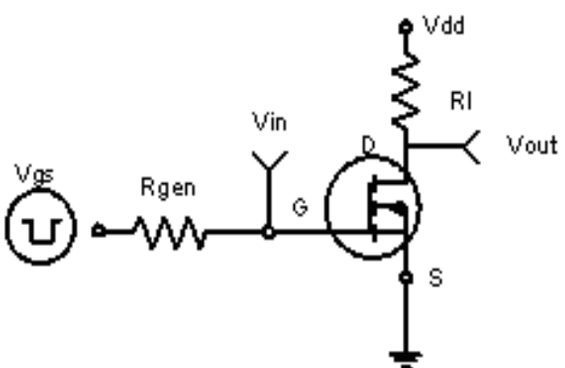
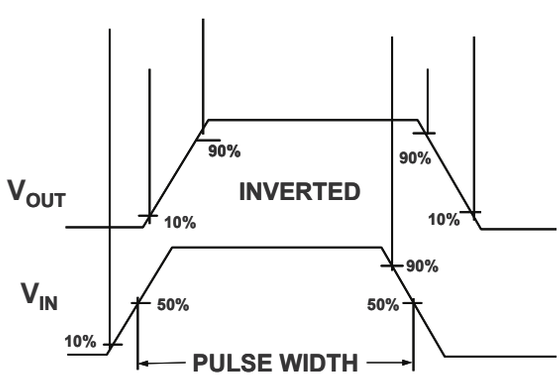
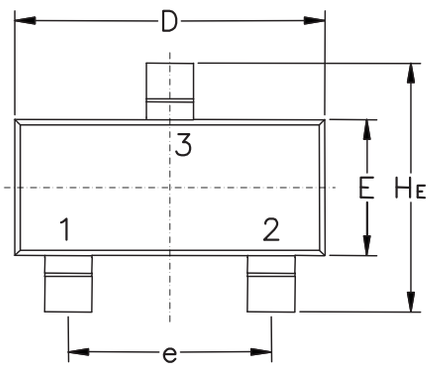


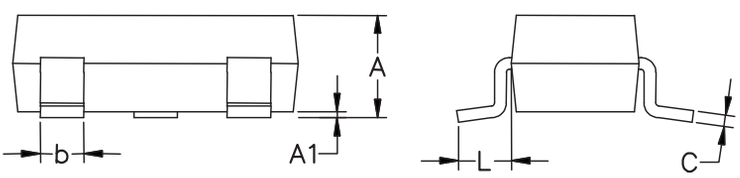
Fig.1-2 Switching Waveform



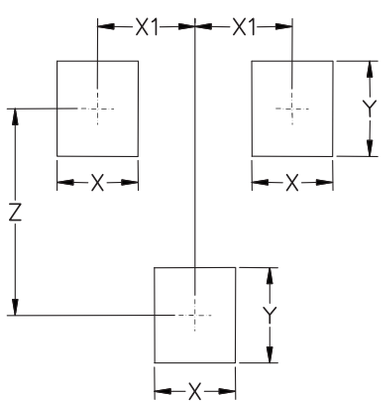
SOT- 23 Package Outine & Dimensions (Units: mm / in)



Symbol	Millimeters			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	1.11	1.25	0.042	0.044	0.050
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.30	0.44	0.50	0.012	0.018	0.020
C	0.09	0.13	0.20	0.003	0.005	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.50	1.60	1.70	0.059	0.051	0.067
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.35	0.54	0.69	0.014	0.021	0.027
HE	2.65	2.80	2.95	0.104	0.112	0.116



Soldering Foot print



Symbol	Millimeters	Inches
X	0.80	0.031
X1	0.96	0.037
Y	0.90	0.035
Z	2.40	0.096

優恩半導體 UNSEMI

ROHS

Disclaimer

UNSEMI RESERVES THE RIGHT TO MAKE CHANGE ON OUR PRODUTS , PRODUCTS SPECIFICATION AND DATA WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

UN SEMICONDUCTOR LIMITED its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “UNSEMI”)does not give any representations or warranties for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

In no event shall UNSEMI be liable for any indirect, incidental, punitive, special or consequential damages (including any and all implied warranties, warranties of fitness for particular purpose, non-infringement and merchantability.) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Statements regarding the suitability of products for certain types of applications are based on UNSEMI knowledge of typical requirements that are often placed on UNSEMI products in generic applications. Such statements are not binding, statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify UNSEMI's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Unless otherwise agreed in writing, UNSEMI product is not designed, authorized or warranted to be suitable for use in medical life-saving, or life-sustaining application , nor in applications where failure or malfunction of a UNSEMI product can reasonably be expected to result in personal injury, death or severe property or environmental damage. UNSEMI and its suppliers accept no liability for inclusion or use of UNSEMI products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

All referenced brands, product names, service names and trademarks are the property of their respective owners.