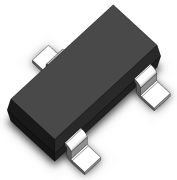
N-Channel MOSFET

UNNM2300

Description

The UNNM2300 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit.

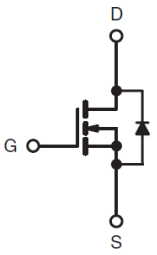
SOT-23



Feature

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-23

Functional Diagram



Applications

- DC/DC Converter for Portable Devices
- Load/Power Switching for portable device

Mechanical Data

- Device : UNNM2300
- Package : SOT-23
- Material : Halogen free
- Packing : Tape & Reel
- Quantity per reel : 3,000 PCS
- Flammability Rating : UL 94V-0
- Reel size : 7 inch

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	**t ≤ 10 s**	$R_{\theta JA}$	105	125	°C/W
Junction-to-Case Thermal Resistance	**Steady State**	$R_{\theta Jc}$	75	90	°C/W

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR4 board using minimum pad size, 1oz copper

c Repetitive rating, pulse width limited by junction temperature, tp=10us, Duty Cycle=1%

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Ordering Information per line@25℃(unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D =250uA	20.5			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0V			1	uA
Gate -to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±10V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V $_{DS}$, I_D = 250uA	0.5	0.75	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 4. 5V, I_D =4.0A		28	45	mΩ
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 2. 5V, I_D = 2.5A		35	55	mΩ
Forward Trans conductance	G_{FS}	V_{DS} = 5. 0 V, I_D =4.0A		8	16	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V , f = 1MHz		360		pF
Outp ut Capacitance	C_{OSS}	V_{DS} = 10 V		50		pF
Reverse Transfer Capacitance	C_{RSS}	V_{GS} = 4. 5 V, V_{DS} =10 V, I_D =4.0 A		42.8		nC
Total Gate Charge	$Q_{G(TOT)}$			8.0		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.85		nC
Gate -to-Source Charge	Q_{GS}			0.75		nC
Gate -to-Drain Charge	Q_{GD}			3.2		nC
SWITCHING CHARACTERISTICS						
Turn -On Delay Time	$t_{d(ON)}$	V_{GS} = 4 .5 V, V_{DS} = 10 V, R_L=10Ω, R_G=6 Ω		11		ns
Rise Time	t_r			58		ns
Turn-Off Delay	$t_{d(OFF)}$			20		ns
Fall Time	t_f			12		ns
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{DS}	V_{GS} = 0 V, I_S = 1.0A			1.5	V

Ordering Information per line@25℃(unless otherwise specified)

Parameter		Symbol	10s	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current [a]	TA=25℃	I_D	4.0	A
Continuous Drain Current [a]	TA=70℃	I_D	2.5	A
Maximum Power Dissipation [a]	TA=25℃	P_D	1.1	W
Maximum Power Dissipation [a]	TA=70℃	P_D	0.7	W
Pulsed Drain Current [c]		I_{DM}	16	A
Operating Junction Temperature		T_J	150	°C
Lead Temperature		T_L	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C

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Characteristic Curves

Figure 1. Typ. Output Characteristics

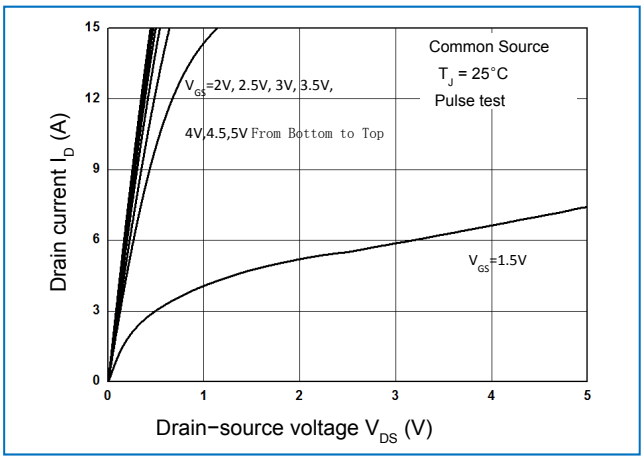


Figure 2. Transfer Characteristics

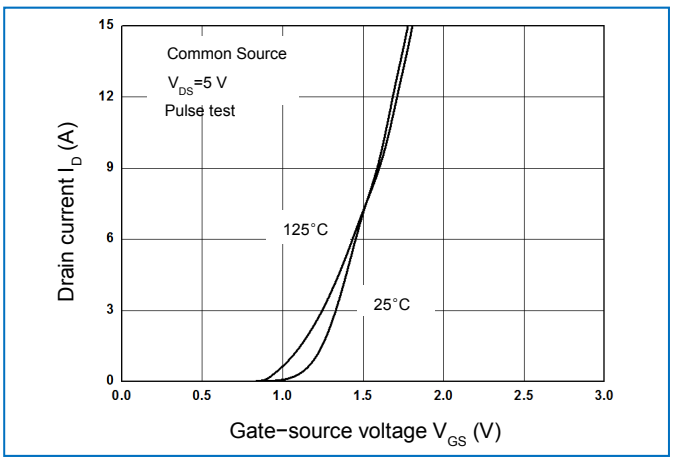


Figure 3. Capacitance Characteristics

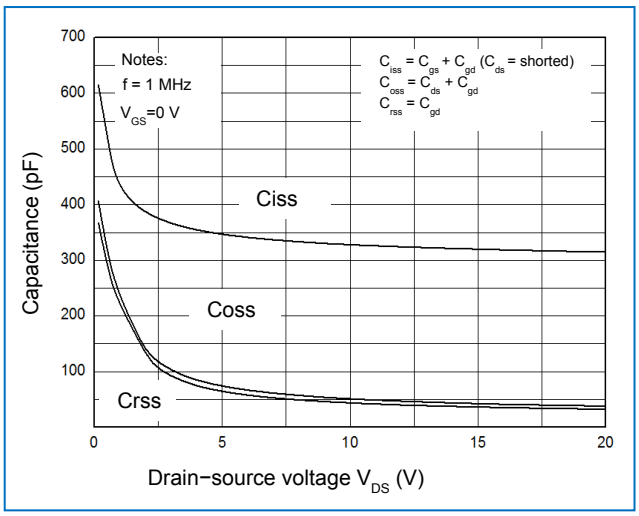


Figure 4. Gate Charge Waveform

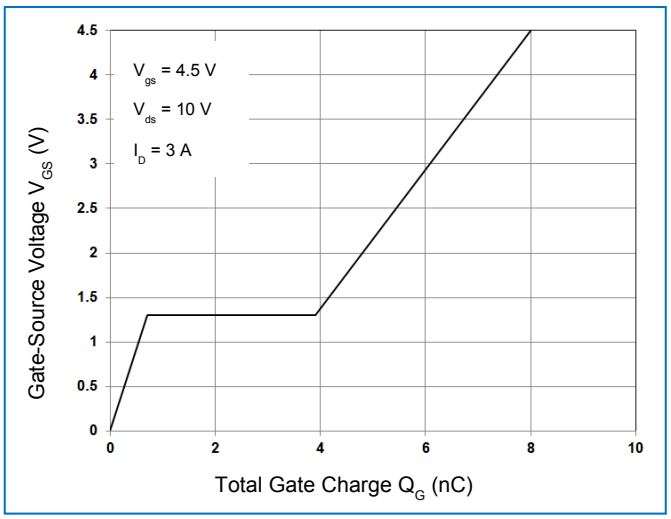


Figure 5. Body-Diode Characteristics

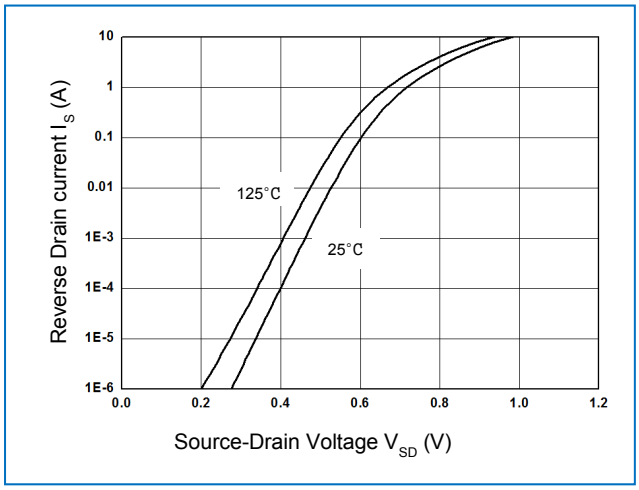
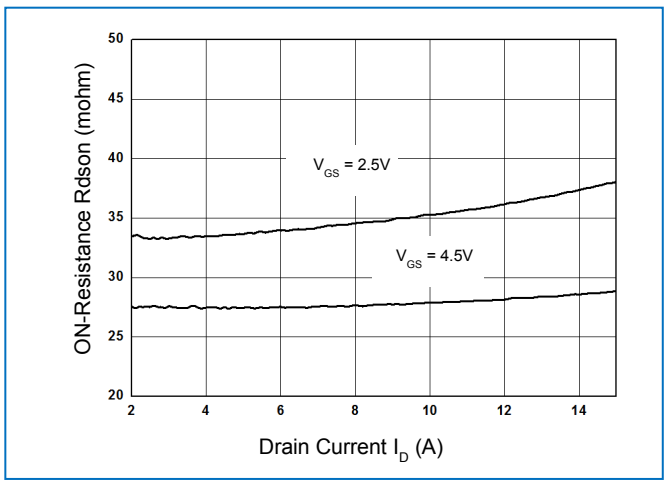


Figure 6. Rdson-Drain Current



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Figure 7. Rdson-Junction Temperature(℃)

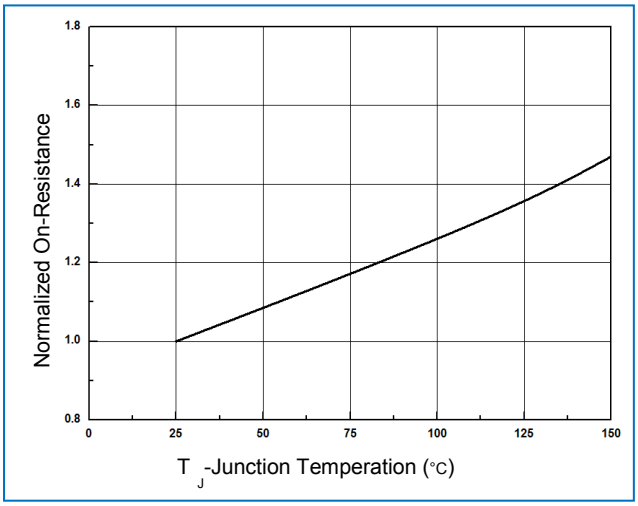


Figure 8. Maximum Safe Operating Area

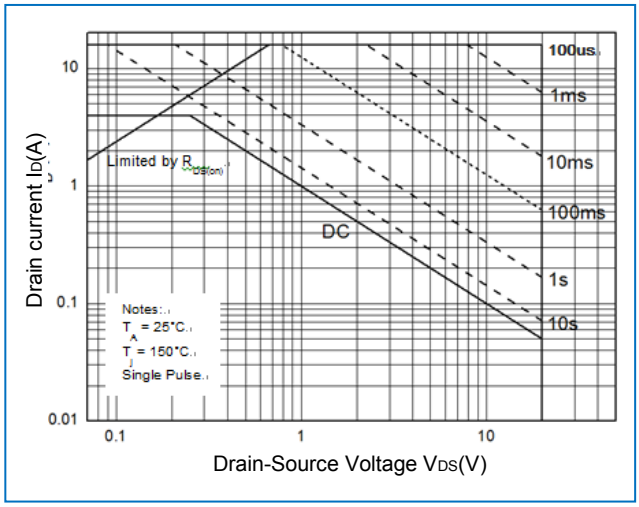
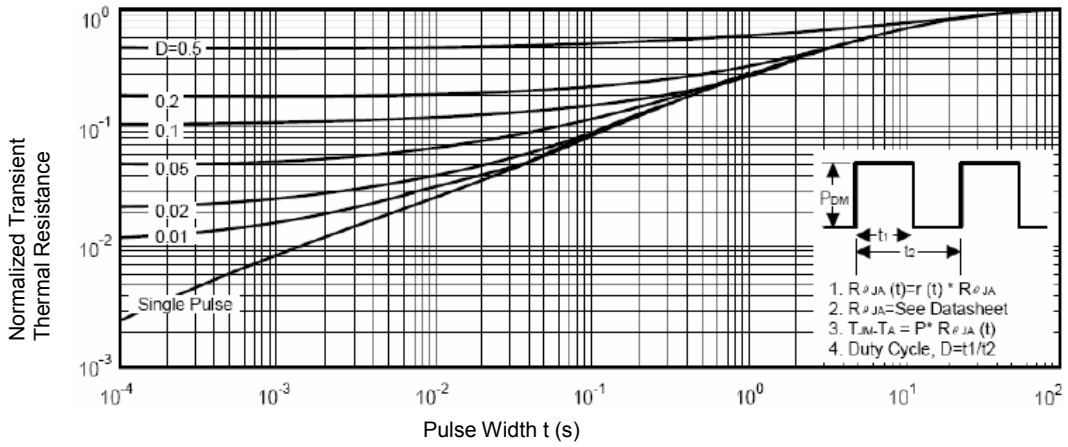


Figure 9. Normalized Maximum Transient Thermal Impedance (RthJA)

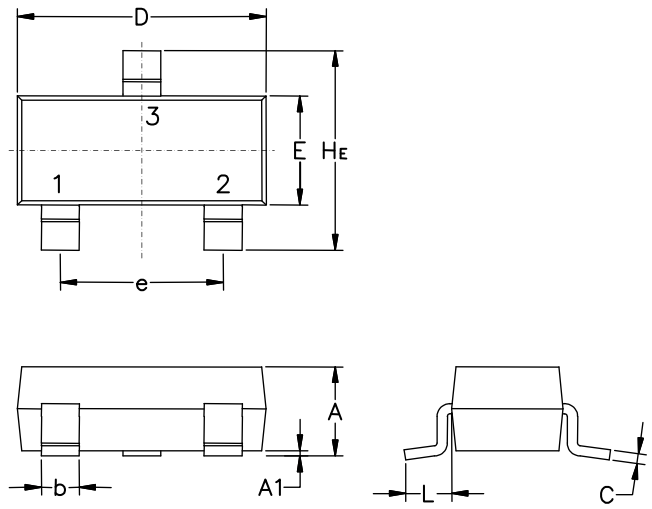


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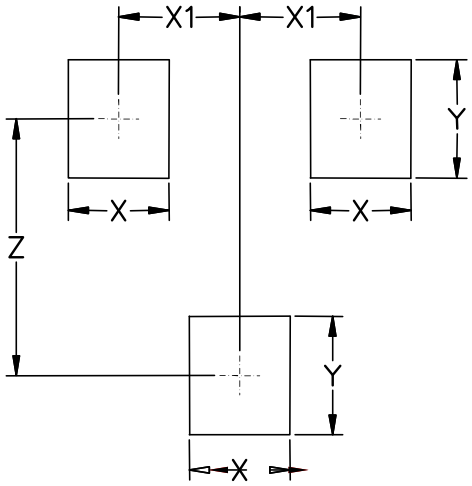
UNNM2300

SOT-23 Package Outline & Dimensions



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	0.15	0.18	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
H_E	2.10	2.40	2.64	0.083	0.094	0.104

Soldering Footprint



Symbol	Millimeters	Inches
X	0.80	0.031
X1	0.95	0.037
Y	0.90	0.035
Z	2.00	0.079

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