



WANSEMI
万芯半导体

WP2302A

Enhancement Mode N-Channel Power MOSFET

SOT23-3/NMOS/20V/±12V/0.8V/4A/27mΩ

Rev0.7

20V, 27mΩ, 4A, Single N-Channel

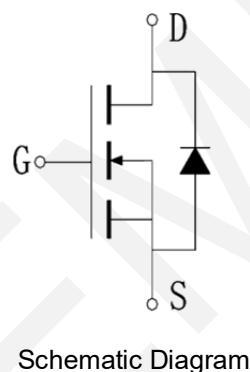
1.Features

- ◆ 20V MOSFET technology
- ◆ Low on-state resistance
- ◆ Fast switching
- ◆ $V_{GS} \pm 12V$

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
20V	27mΩ @ 4.5V	4A
	37mΩ @ 2.5V	

2.Applications

- ◆ Power Switching Application
- ◆ Load Switching



3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP2302A	A2SHB	SOT23-3	3,000	180,000

4.Absolute Max Ratings at $T_a=25^{\circ}C$ (Note1)

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	V_{DSS}	20	V
Gate to Source Voltage	V_{GSS}	± 12	V
Drain Current (DC)	I_D	4	A
Drain Current (Pulse), $PW \leq 300\mu s$	I_{DP}	10.8	A
Total Dissipation	P_D	0.9	W
Junction Temperature	T_j	150	$^{\circ}C$
Storage Temperature	T_{stg}	-55 to +150	$^{\circ}C$

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

5. Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient (Note 2)	$R_{\theta JA}$	125	$^{\circ}\text{C/W}$

Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

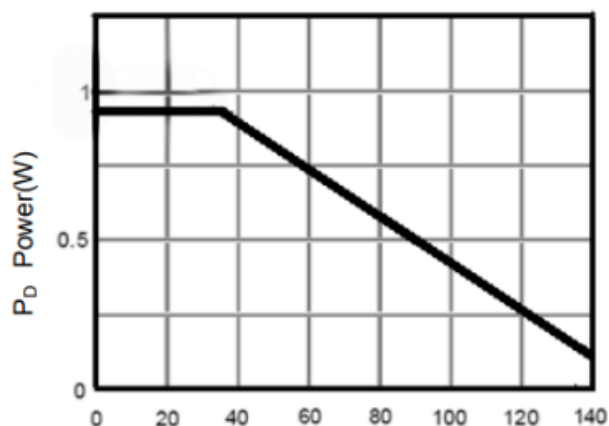
6. Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Note 3)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	20	22		V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS1}	$V_{GS} = \pm 12\text{V}$, $V_{SS} = 0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	0.4	0.8	1	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 4\text{A}$, $V_{GS} = 4.5\text{V}$		27	35	$\text{m}\Omega$
		$I_D = 2\text{A}$, $V_{GS} = 2.5\text{V}$		37	50	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$,		300		pF
Output Capacitance	C_{oss}	$V_{DS}=10\text{V}$,		120		pF
Reverse Transfer Capacitance	C_{rss}	Frequency=1.0MHz		80		pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{V}$, $I_D = 2.9\text{A}$, $V_{GEN} = 4.5\text{V}$, $R_G = 6\Omega$		10		ns
Rise Time	t_r			50		ns
Turn-OFF Delay Time	$t_{d(off)}$			17		ns
Fall Time	t_f			10		ns
Total Gate Charge	Q_g	$V_{DS} = 10\text{V}$, $V_{GS} = 4.5\text{V}$, $I_{DS} = 2.9\text{A}$		4		nC
	Q_{gs}			0.65		nC
	Q_{gd}			1.2		nC
Diode Forward Voltage	V_{FSD}	$I_S = 2.9\text{A}$, $V_{GS} = 0\text{V}$		0.9	1.2	V

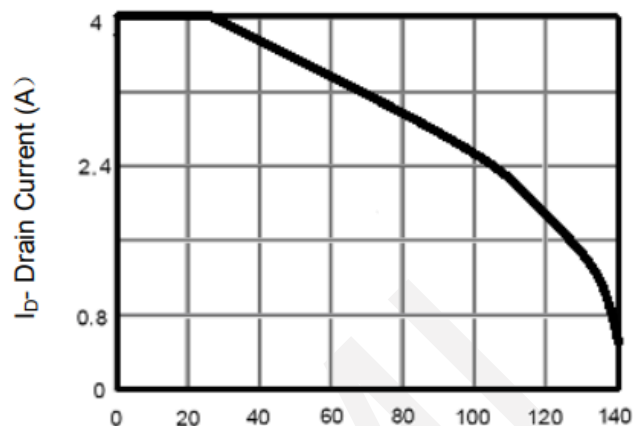
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



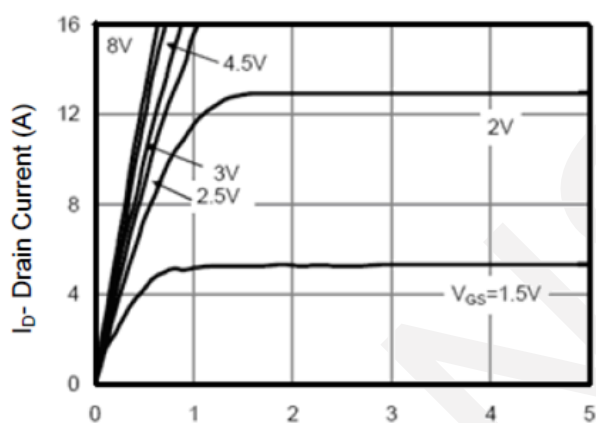
7. Typical electrical and thermal characteristics



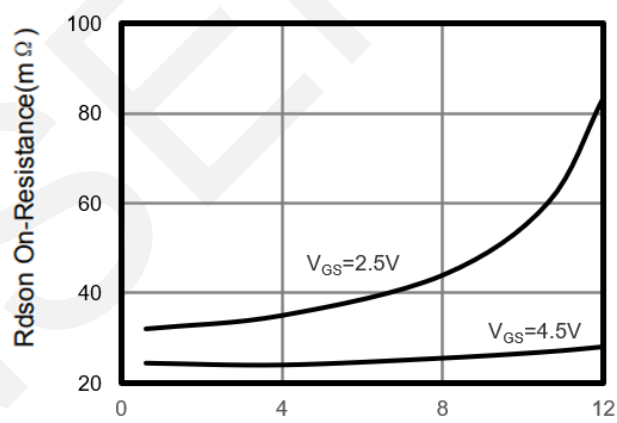
T_J-Junction Temperature(°C)
Power Dissipation



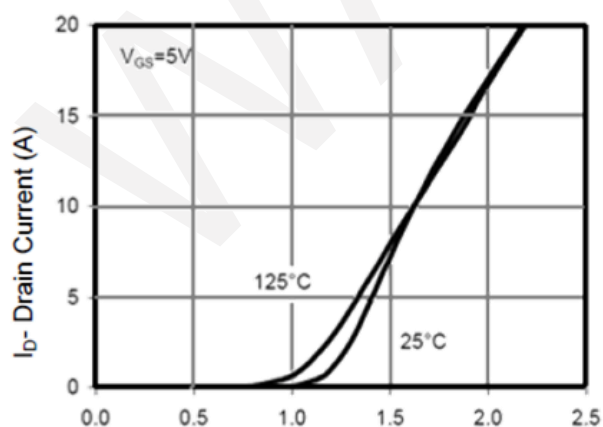
T_J-Junction Temperature(°C)
Drain Current



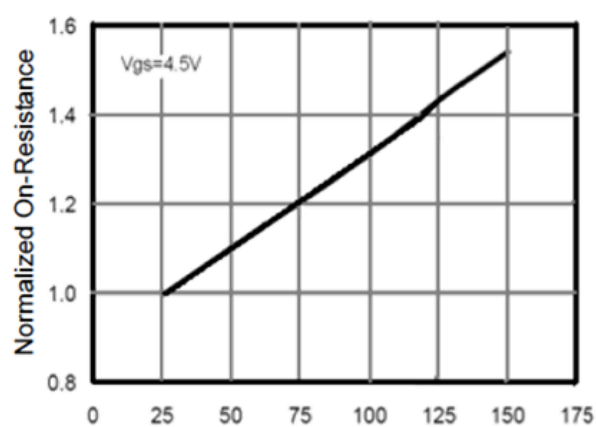
V_{DS} Drain-Source Voltage (V)
Output Characteristics



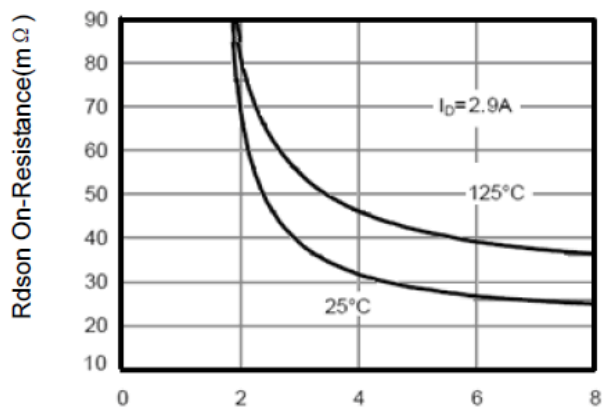
I_D- Drain Current (A)
Drain-Source On-Resistance



V_{GS} Gate-Source Voltage (V)
Transfer Characteristics

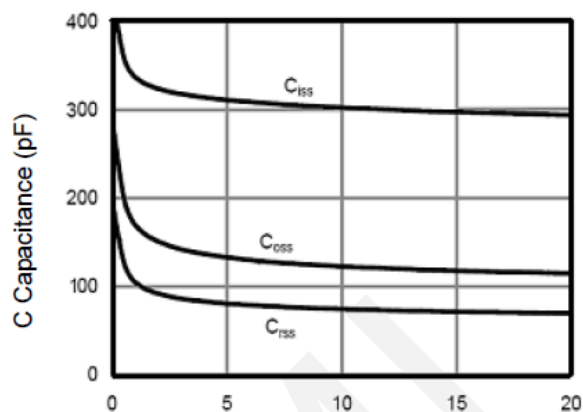


T_J-Junction Temperature(°C)
Drain-Source On-Resistance



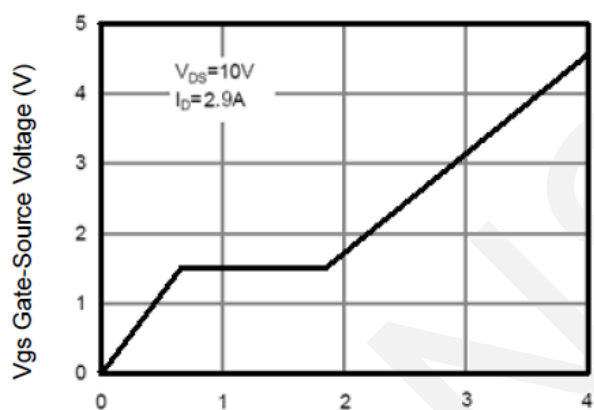
Vgs Gate-Source Voltage (V)

Rdson vs Vgs



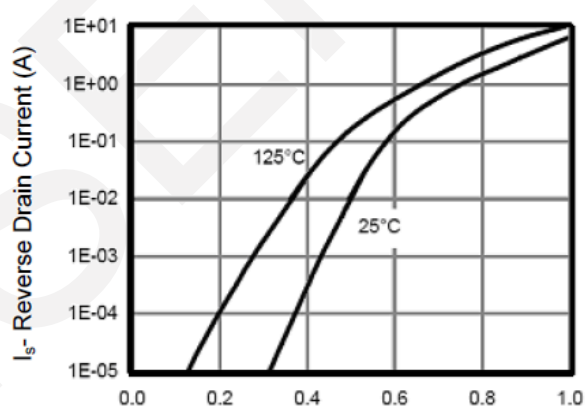
Vds Drain-Source Voltage (V)

Capacitance vs Vds



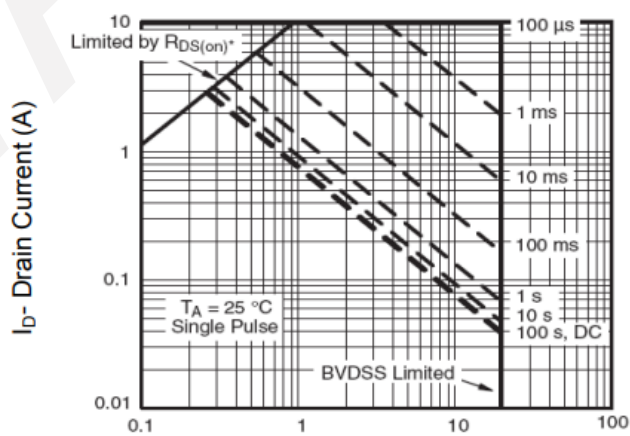
Qg Gate Charge (nC)

Gate Charge



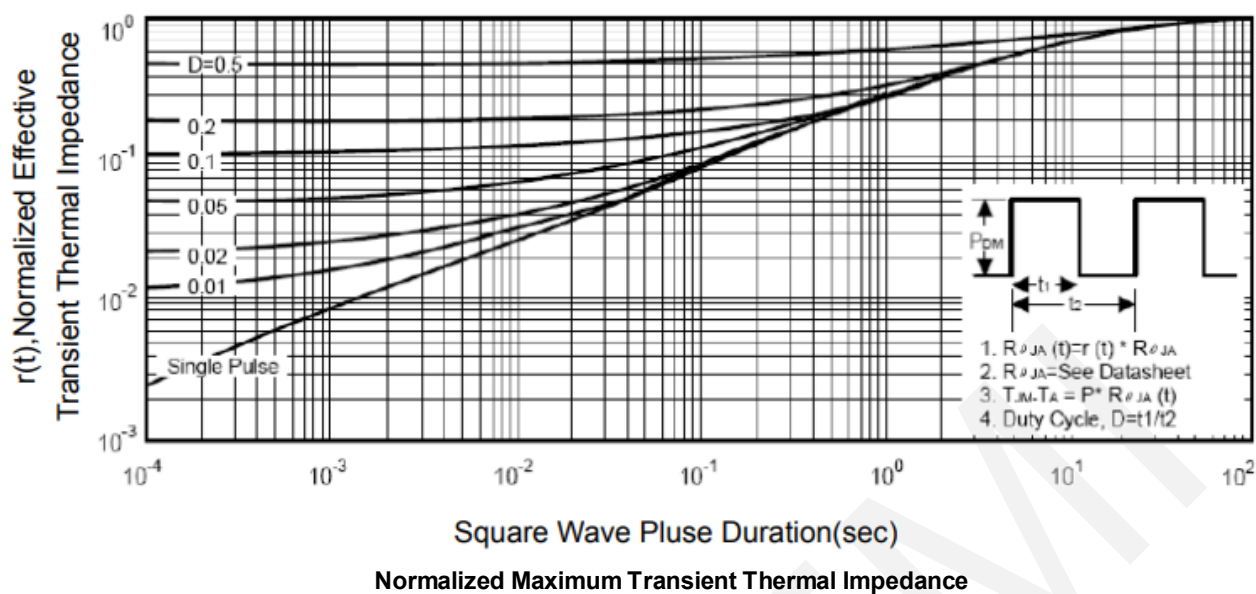
Vsd Source-Drain Voltage (V)

Source- Drain Diode Forward

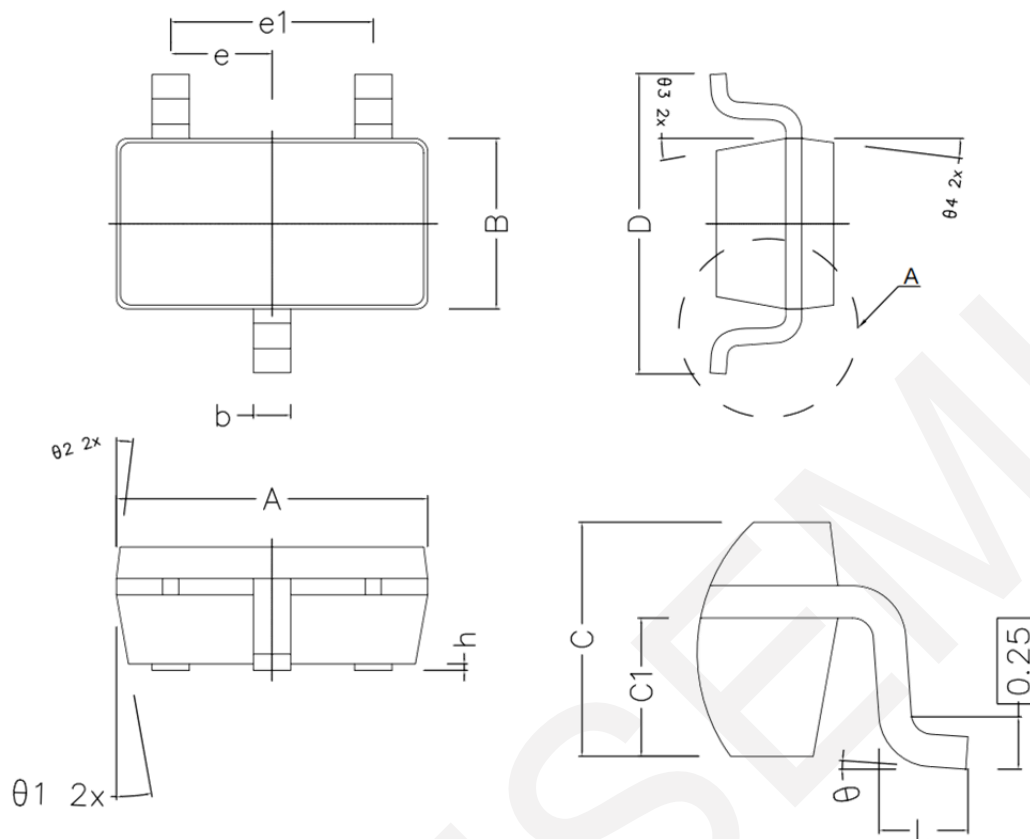


Vds Drain-Source Voltage (V)

Safe Operation Area



8.Package Dimensions



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.820	2.920	3.020
B	1.500	1.600	1.700
C	1.050	1.100	1.150
C1	0.600	0.650	0.700
D	2.650	2.800	2.950
L	0.300	0.450	0.600
b	0.280	0.350	0.420
h	0.020	0.050	0.100
e	0.950TYPE		
e1	1.900TYPE		
θ_1	10° TYPE		
θ_2	7° TYPE		
θ_3	10° TYPE		
θ_4	7° TYPE		
θ	0° ~ 8°		

9. Important Notice

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