



**WANSEMI**  
万芯半导体

**WP2305AS3**

# **Enhancement Mode P-Channel Power MOSFET**

**SOT23-3/PMOS/-20V/ $\pm 12$ V/-0.65V/-5.5A/23m $\Omega$**

**Rev0.7**

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## -20V, 23mΩ, -5.5A, P-Channel MOSFET

### 1.Features

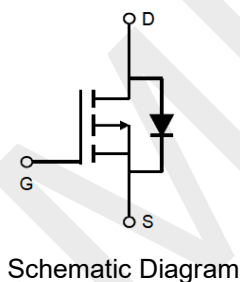
- ◆ Advanced Trench Technology
- ◆ Surface mount package

### 2.Applications

- ◆ Power Management
- ◆ Load Switching



$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$
-20V	23mΩ @ -4.5V	-5.5A
	29mΩ @ -2.5V	



### 3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP2305AS3	2305A	SOT23-3	3,000	180,000

### 4.Absolute Max Ratings at Ta=25°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)	$I_D$	-5.5	A
Drain Current (Pulse), $PW \leq 300\mu s$	$I_{DP}$	-22	A
Total Dissipation	$P_D$	1.2	W
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°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 (Note 2)

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	104	°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.

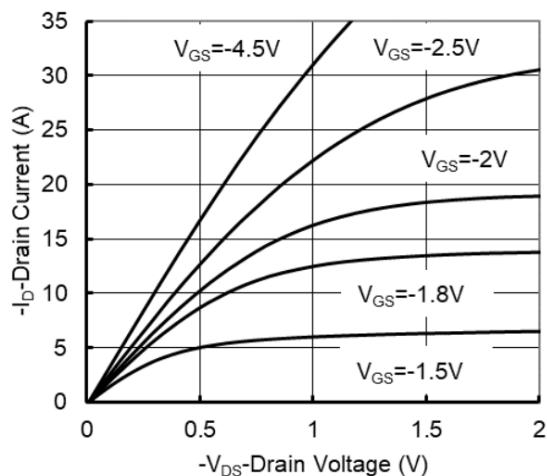
**6. Electrical Characteristics at Ta=25°C (Note 3)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -250\mu A, V_{GS} = 0V$	-20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.4	-0.65	-1.2	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 4A, V_{GS} = -4.5V$		23	48	m $\Omega$
		$I_D = 3A, V_{GS} = -2.5V$		29	53	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz		1010		pF
Output Capacitance	$C_{oss}$			130		pF
Reverse Transfer Capacitance	$C_{rss}$			109		pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DS} = -10V, R_L=2.5\Omega,$ $R_G = 3\Omega, V_{GEN} = -4.5V$		8.5		ns
Rise Time	$t_r$			36		ns
Turn-OFF Delay Time	$t_{d(off)}$			77		ns
Fall Time	$t_f$			56		ns
Total Gate Charge	$Q_g$	$V_{DS} = -10V,$ $V_{GS} = -4.5V,$ $I_D = -4A$		11		nC
	$Q_{gs}$			2.2		nC
	$Q_{gd}$			2.5		nC
Diode Forward Voltage	$V_{FSD}$	$I_S = 4A, V_{GS} = 0$	-0.4	-0.85	-1.2	V

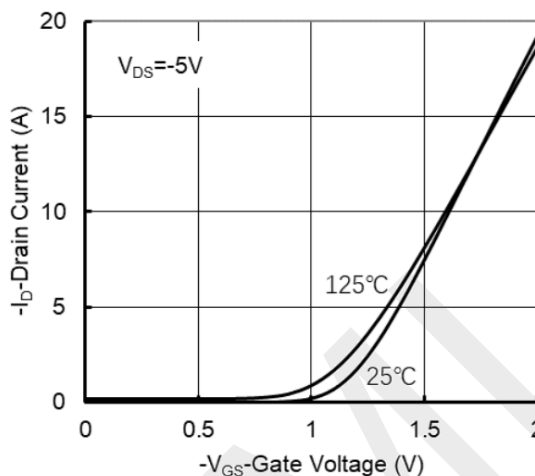
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



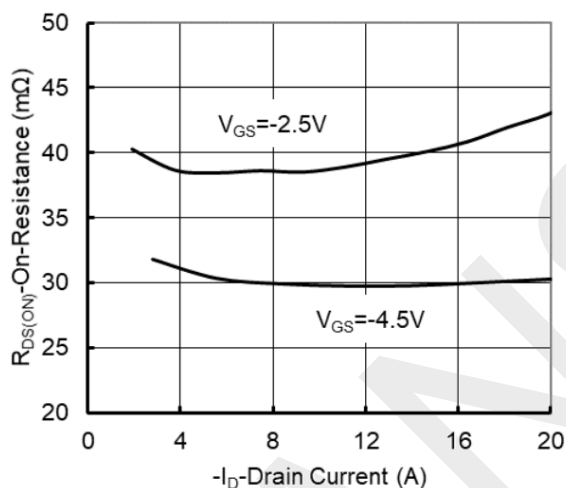
## 7. Typical Electrical and Thermal Characteristics



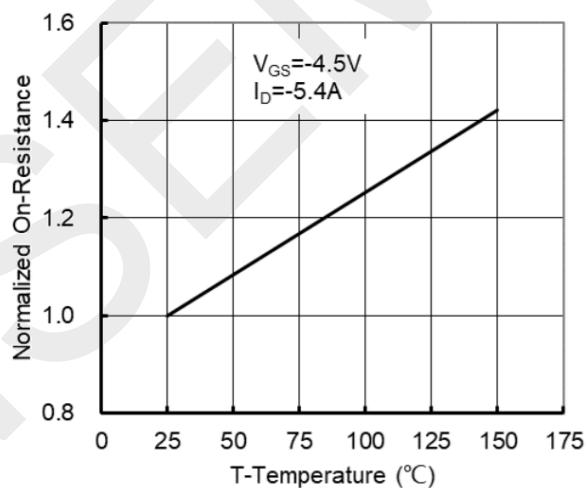
Output Characteristics



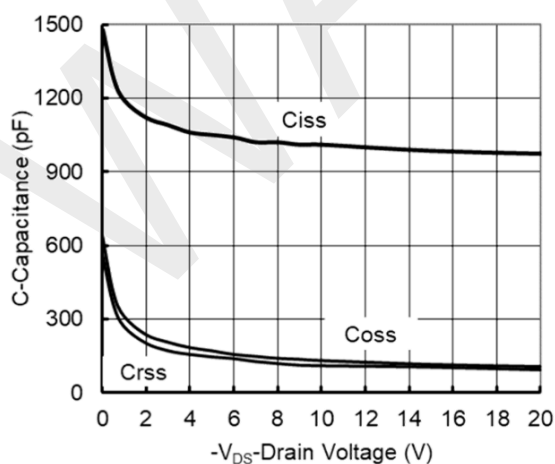
Transfer Characteristics



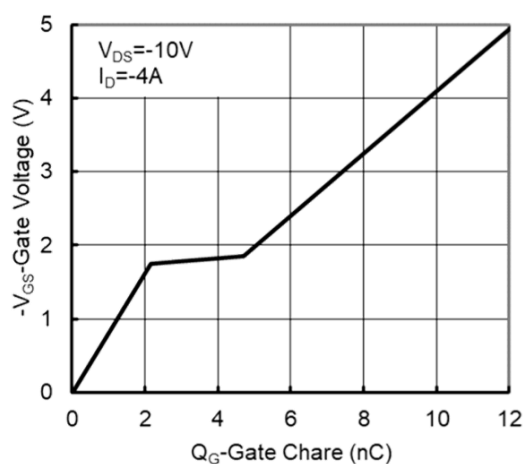
On-resistance vs. Drain Current



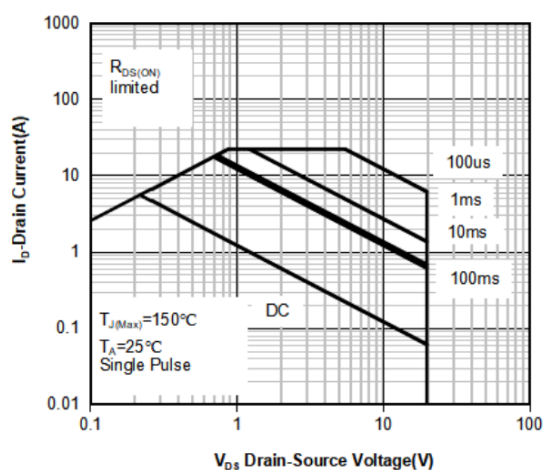
On-Resistance vs. Junction Temperature



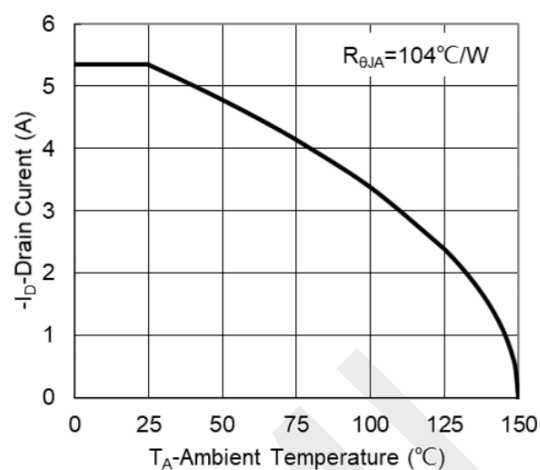
Capacitance Characteristics



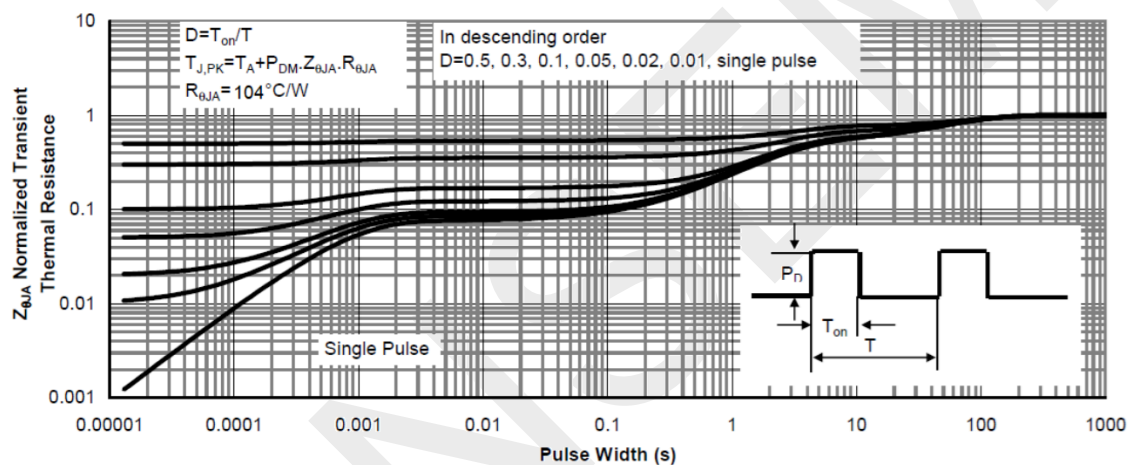
Gate Charge



Safe Operating Area



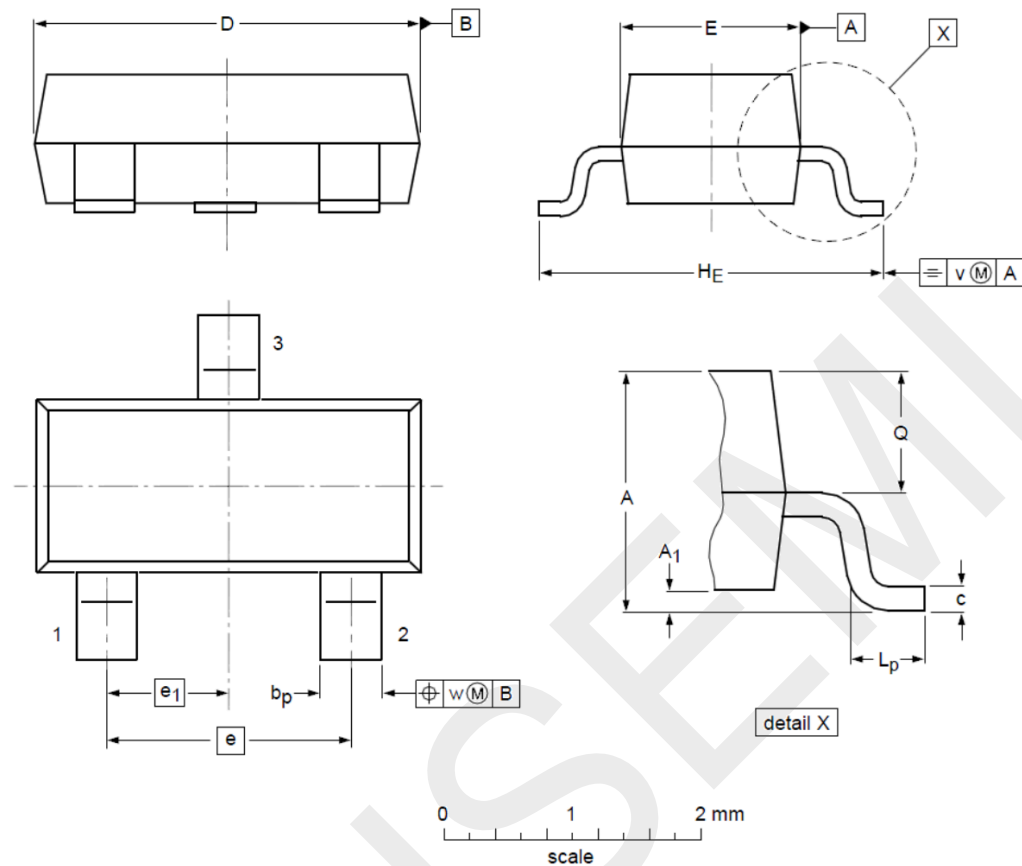
Maximum Continuous Drain Current vs. Ambient Temperature



Normalized Maximum Transient Thermal Impedance



## 8.Package Dimensions



DIMENSIONS ( unit : mm )

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	1.00	1.17	1.30	A <sub>1</sub>	0.01	0.05	0.10
b <sub>p</sub>	0.35	0.39	0.50	c	0.10	0.20	0.26
D	2.70	2.90	3.10	E	1.30	1.58	1.70
e	--	1.90	--	e <sub>1</sub>	--	0.95	--
H <sub>E</sub>	2.50	2.78	3.00	L <sub>p</sub>	0.20	0.32	0.60
Q	0.23	0.27	0.33	v	--	0.20	--
w	--	0.20	--				

## **9.Important Notice**

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