P2305

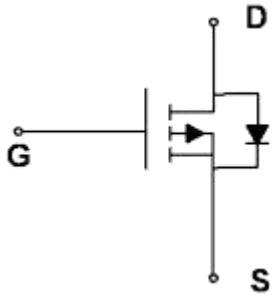
Datasheet

34mΩ, -20V, P-Channel Power MOSFET P2305

Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-20V	34mΩ@-4.5V	-5.7A
	45mΩ@-2.5V	

Symbol



Symbol of P2305

Features

- Excellent package for good heat dissipation
- Advanced Trench technology
- Low Gate Charge

Application

- PWM applications
- Load switch
- Power Management

Package Type

SOT - 23

Package Type of P2305

Ordering Information

Product Name	Package
P2305	SOT - 23

Absolute Maximum Ratings(T_A= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current Note 1	T_C=25ºC	I_D	-5.7	A
Pulsed Drain Current Note 2	T_C=25ºC	I_{DM}	-28.5	A
Max Power Dissipation Note 3	T_C=25ºC	P_D	1.15	W
Avalanche Energy, Single Pulse Note 4		E_{AS}	14.4	mJ
Operating and Storage Temperature Range		T_J,T_{SGT}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	108.7	-	ºC/W

Notes:

1) Calculated continuous current based on maximum allowable junction temperature.

2) Repetitive rating; pulse width limited by max. junction temperature.

3) P_D is based on max. junction temperature, using junction-case thermal resistance.

4) V_{DD}= -20V,V_{GS}= -4.5 V, L=0.1 mH, starting T_J=25 °C.

Electrical Characteristics(T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= -250uA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -20V, V_{GS}=0V	-	-	-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±12V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D= -250uA	-0.45	-0.7	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D= -4.1A	-	25.8	34	mΩ
		V_{GS}= -2.5V, I_D= -3A	-	33.0	45	
Gate Resistance	R_g	f=1MHz, Open Drain	-	7.0	-	Ω
Forward Transconductance	gfs	V_{DS}= -5.0V, I_D= -4.1A	-	19.7	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V	-	1046	-	pF
Output Capacitance	C_{oss}	V_{DS}= -10V	-	105	-	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	96	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -10V	-	8.2	-	ns
Rise Time	t_r	V_{GS}= -4.5V	-	38.4	-	
Turn-off Delay Time	$t_{d(off)}$	I_D= -4.1A	-	35	-	
Fall Time	t_f	R_G=1.0Ω	-	48	-	
Gate Charge Characteristics						
Total Gate Charge	Q_g	V_{GS}= -4.5V	-	11.2	-	nC
Gate to Source Charge	Q_{gs}	V_{DS}= -10V	-	2.94	-	
Gate to Drain Charge	Q_{gd}	I_D= -4.1A	-	2.09	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S= -4.1A	-	-0.77	-1.2	V
Reverse recovery time	trr	Isd= -4.1A , dI/dt=80A/us	-	9.2	-	ns
Reverse recovery charge	Qrr		-	2.4	-	nC

Typical Performance Characteristics

Figure 1: Typ. Output Characteristics

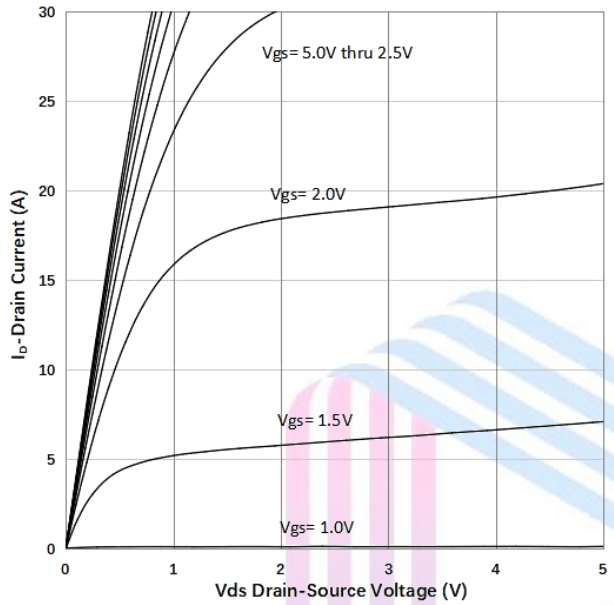


Figure 2: Typ. Transfer Characteristics

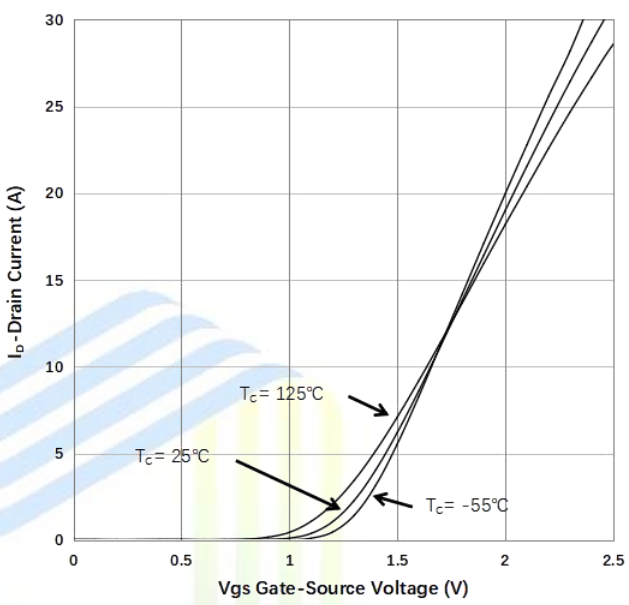


Figure 3: Typ. On-Resistance vs. Drain Current

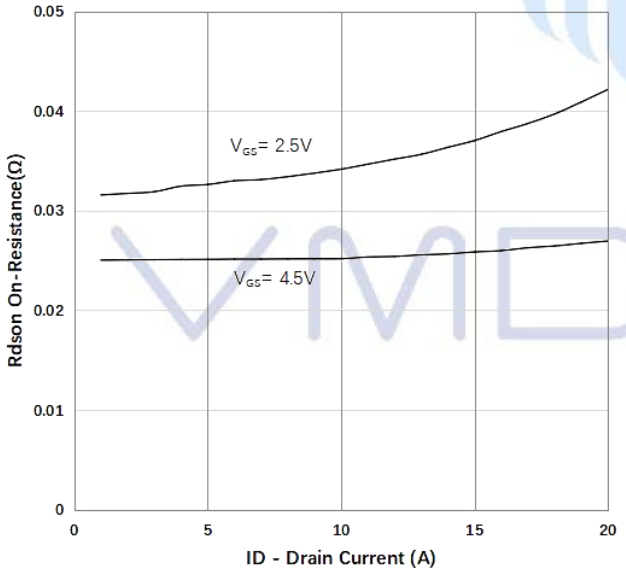


Figure 4: On-Resistance vs. Temperature

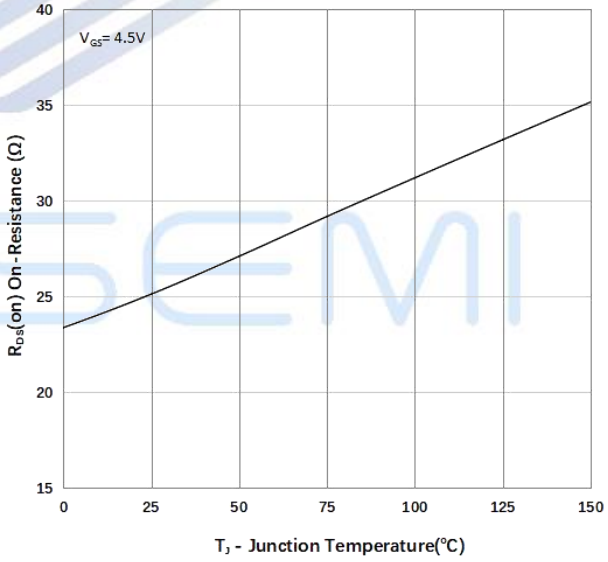


Figure 5: On-Resistance vs.Gate-Source Voltage

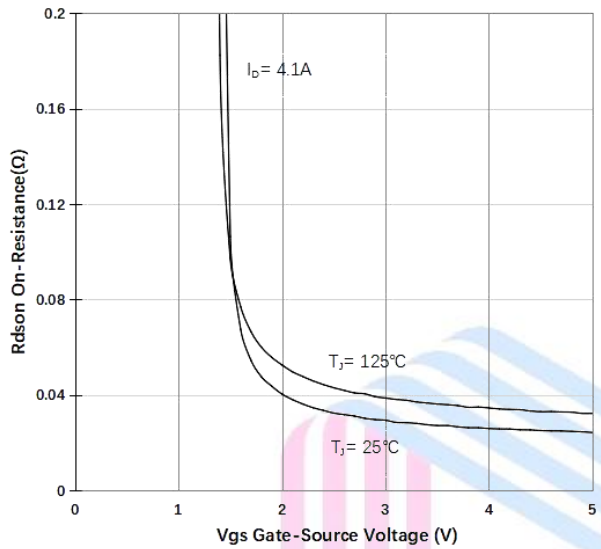


Figure 6: Forward Characteristics of Body Diode

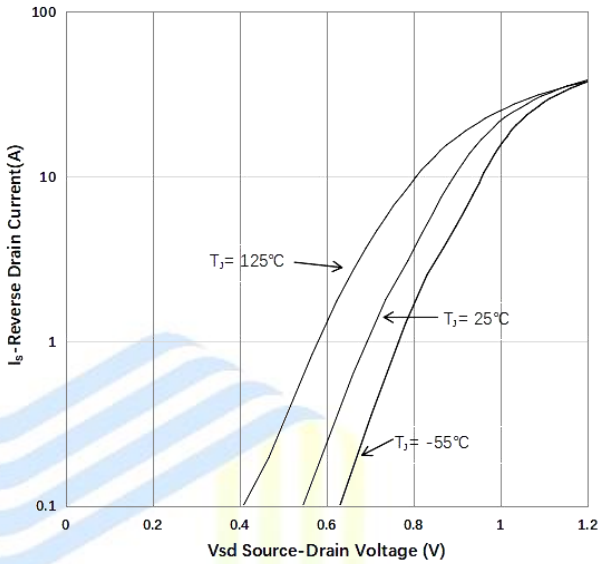


Figure 7: Gate Charge Characteristics

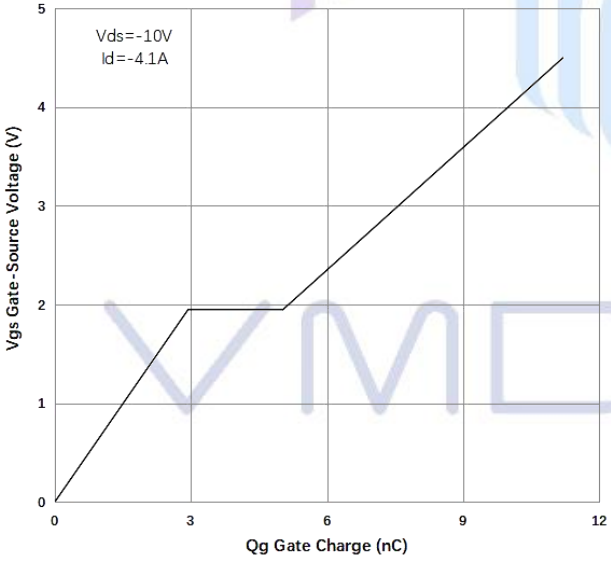


Figure 8: Typ. Capacitances

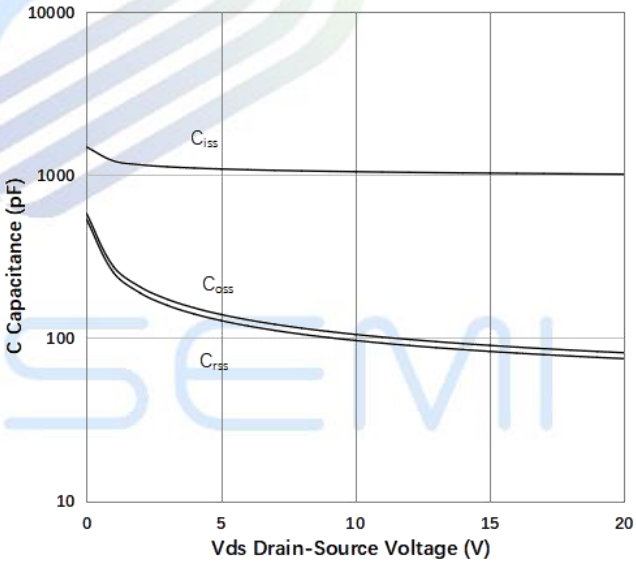
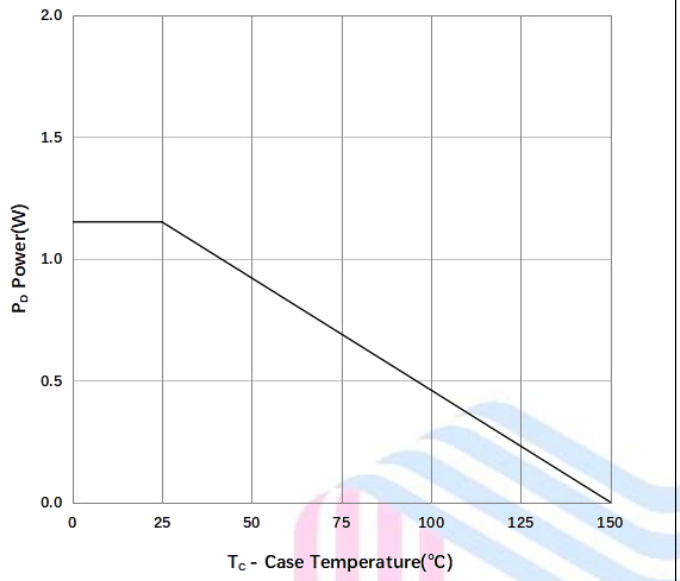


Figure 9: Power Dissipation

Figure 10: Safe Operating Area



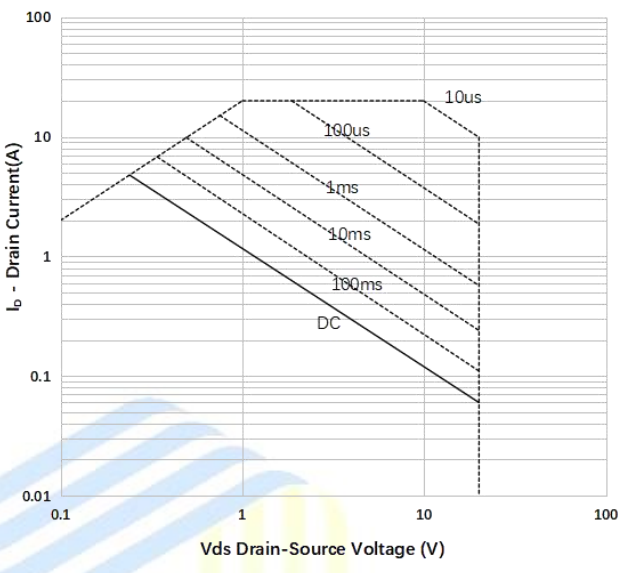
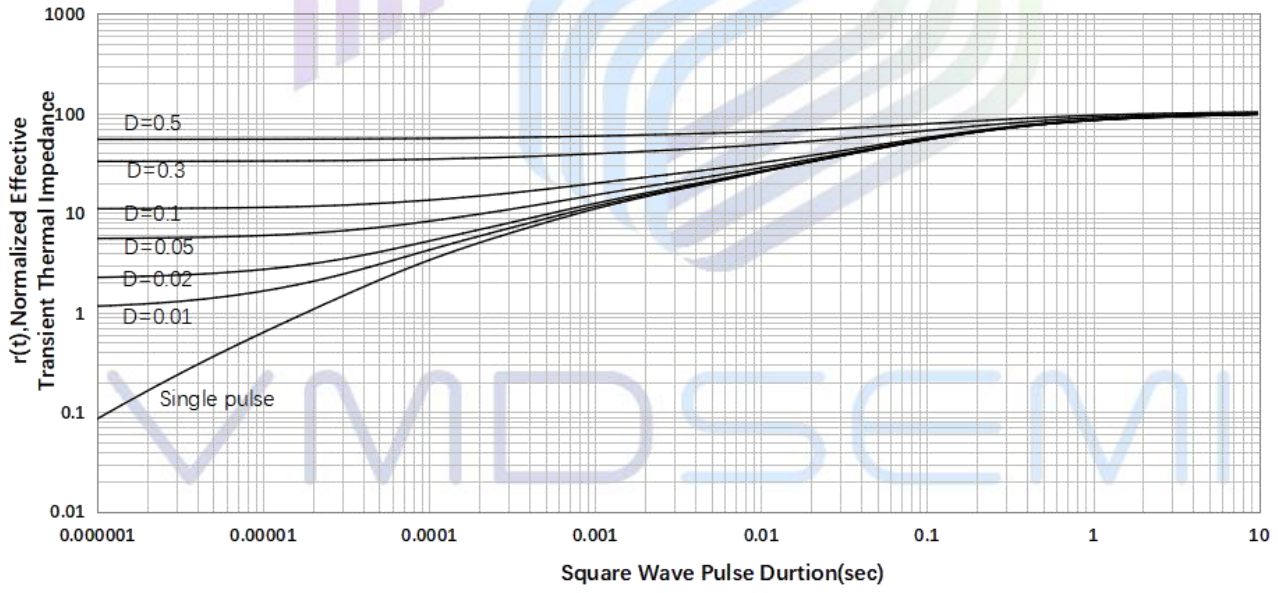
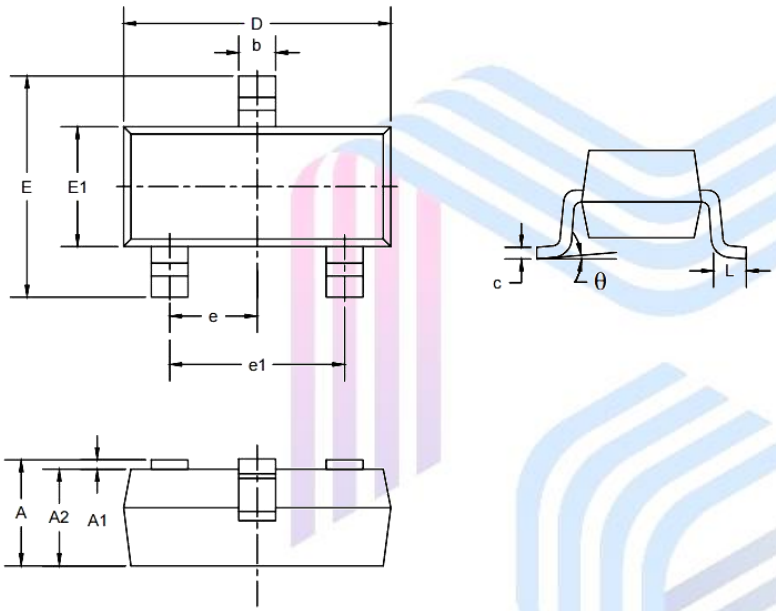


Figure 11: Normalized Max Transient Thermal Impedance



Mechanical Dimensions

SOT-23 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	MAX
A	0.9	1.15
A1	0	0.1
A2	0.9	1.05
b	0.3	0.5
c	0.08	0.15
D	2.8	3
E	2.25	2.55
E1	1.2	1.4
e	0.95TYP	
e1	1.8	2
L	0.3	0.5
θ	0°	8°

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