

P-Channel Enhancement Mode Power MOSFET

Description

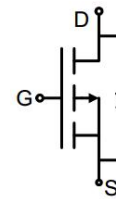
The G2305 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

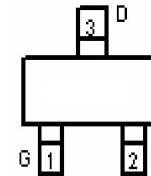
- V_{DS} -20V
- I_D (at $V_{GS} = -10V$) -4.8A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) < 50m Ω
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) < 70m Ω
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



pin Assignment



SOT-23

Ordering Information

Device	Package	Marking	Packaging
G2305	SOT-23	G2305	3000pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Continuous Drain Current	I_D	-4.8	A
Pulsed Drain Current (note1)	I_{DM}	-15	A
Gate-Source Voltage	V_{GS}	± 12	V
Power Dissipation	P_D	1.7	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ\text{C}$

Thermal Resistance

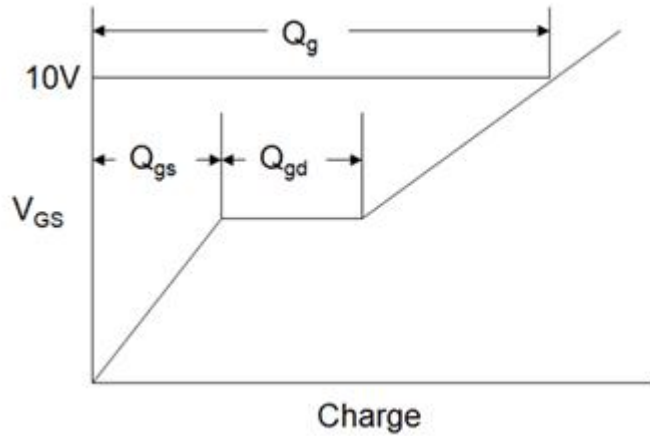
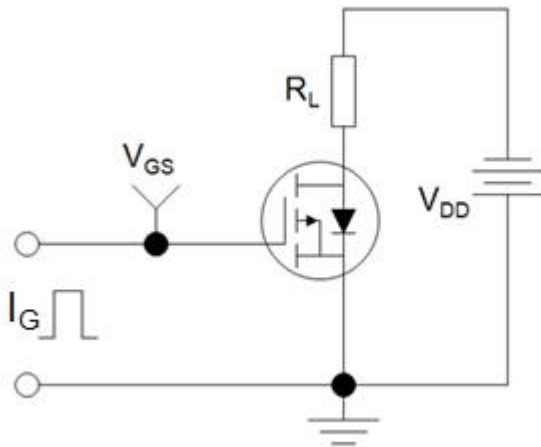
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	74	$^\circ\text{C/W}$

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	--	--	-1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 8V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	-0.7	-1.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.1A$	--	45	50	m Ω
		$V_{GS} = -4.5V, I_D = -3A$	--	60	70	
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -3.5A$	--	8.5	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = -4V,$ $f = 1.0MHz$	--	740	--	pF
Output Capacitance	C_{oss}		--	290	--	
Reverse Transfer Capacitance	C_{rss}		--	190	--	
Total Gate Charge	Q_g	$V_{DD} = -4V,$ $I_D = -4.1A,$ $V_{GS} = -4.5V$	--	7.8	--	nC
Gate-Source Charge	Q_{gs}		--	1.2	--	
Gate-Drain Charge	Q_{gd}		--	1.6	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -4V,$ $I_D = -3.3A,$ $R_G = 1\Omega$	--	12	--	ns
Turn-on Rise Time	t_r		--	35	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	t_f		--	10	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	-1.6	A
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = -20A, V_{GS} = 0V$	--	--	-1.2	V

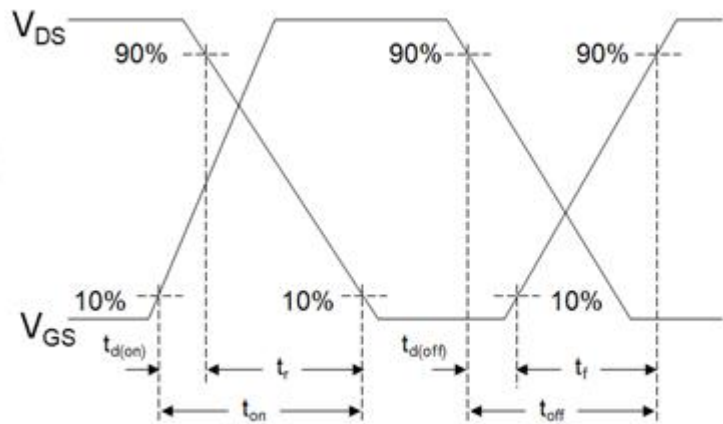
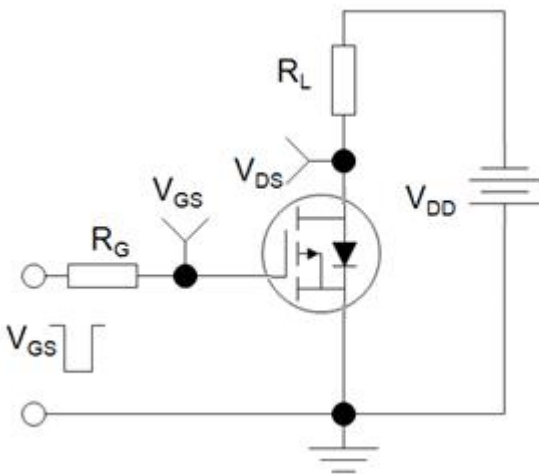
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : $T_J=25^\circ\text{C}, V_{DD}=-20V, V_{GS}=-10V, L=0.5mH, R_g=25\Omega$

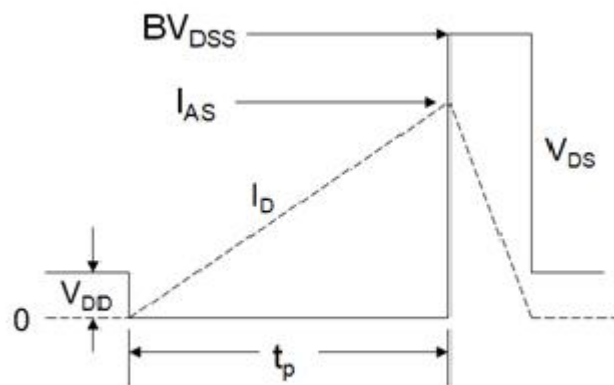
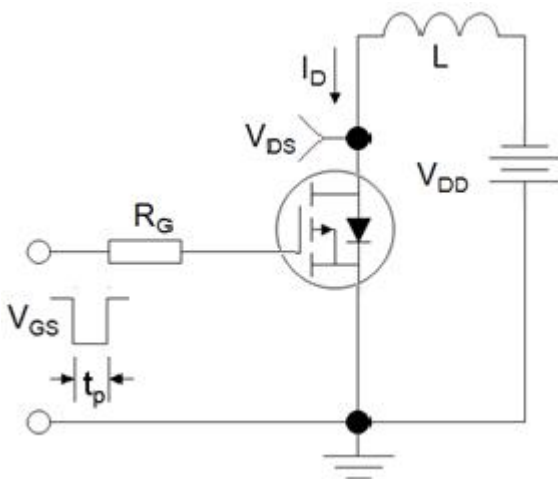
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

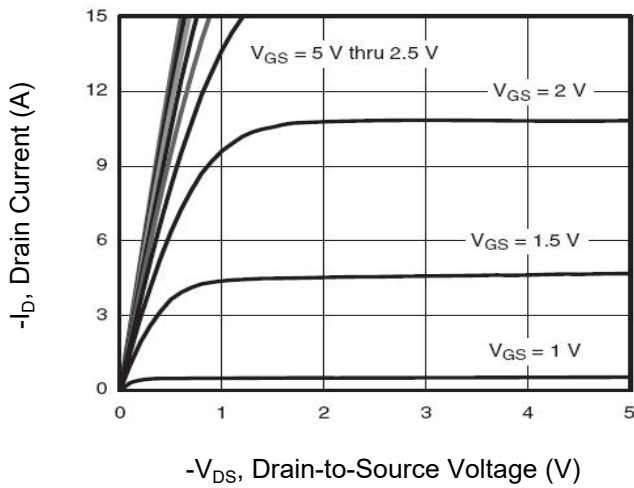


Figure 2. Transfer Characteristics

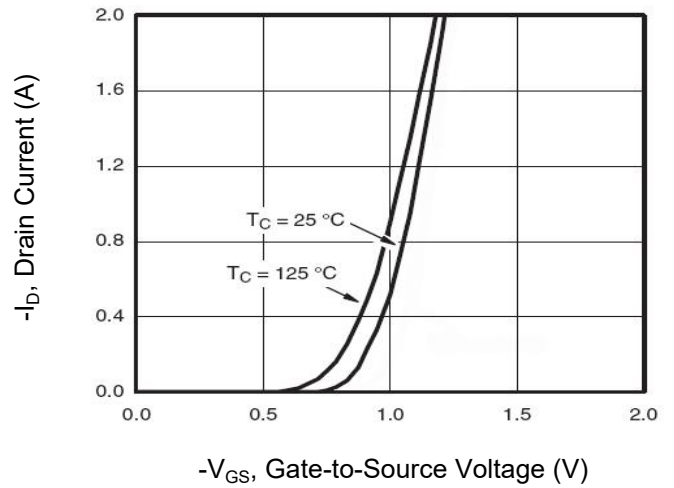


Figure 3. Drain Source On Resistance

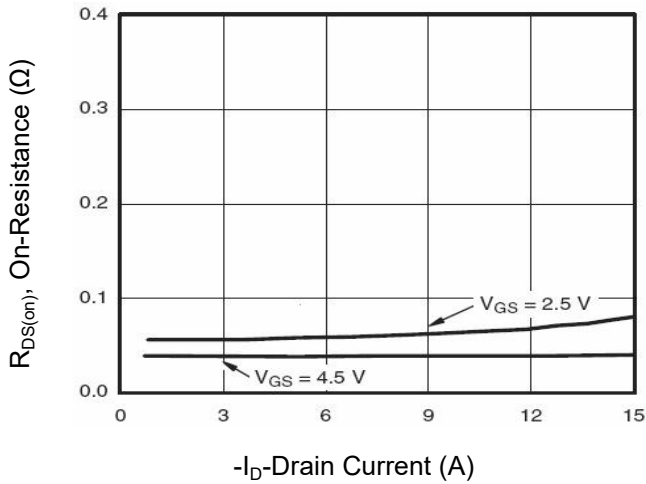


Figure 4. Gate Charge

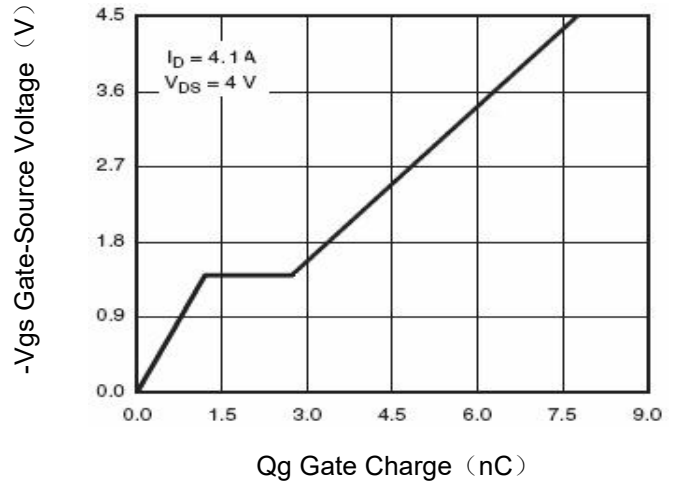


Figure 5. Capacitance

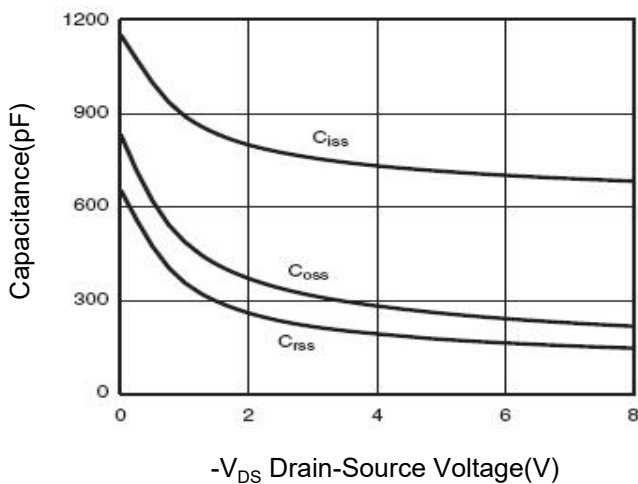
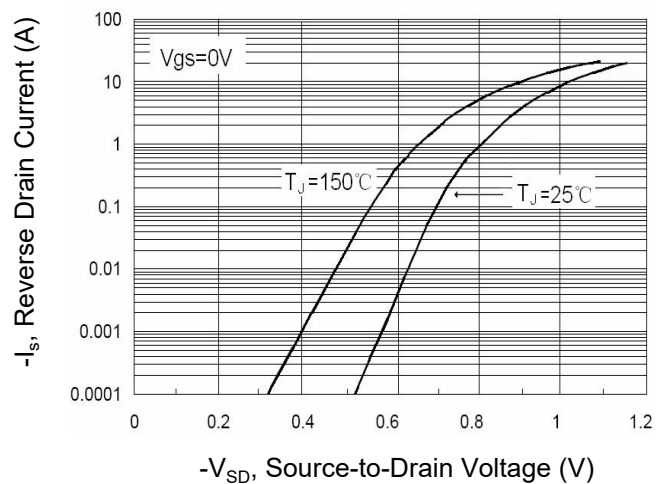


Figure 6. Source-Drain Diode Forward



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Drain-Source On-Resistance

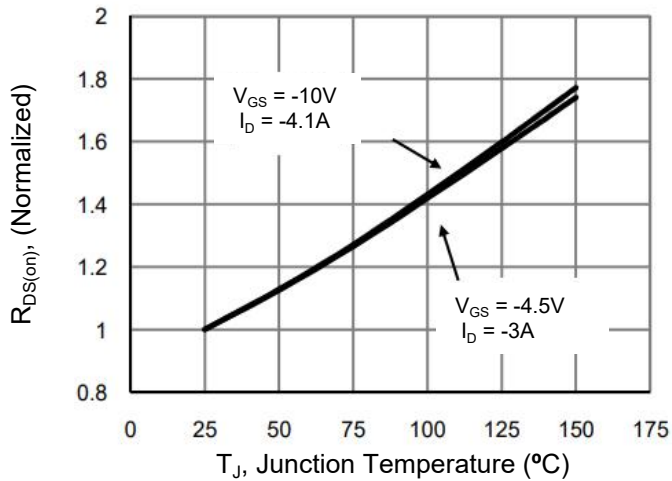


Figure 10. Safe Operation Area

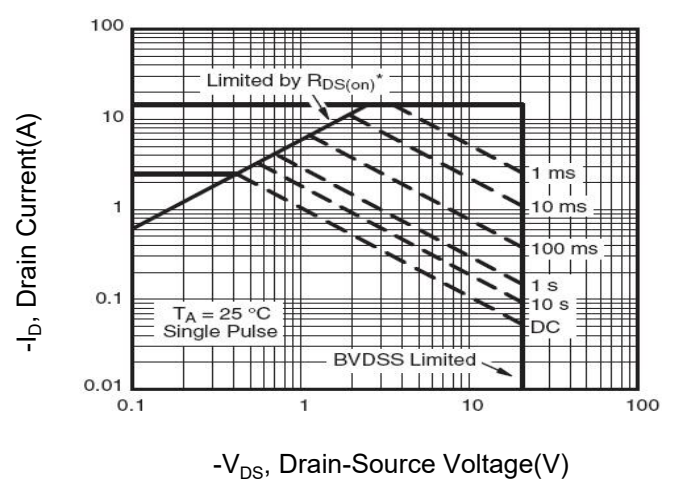
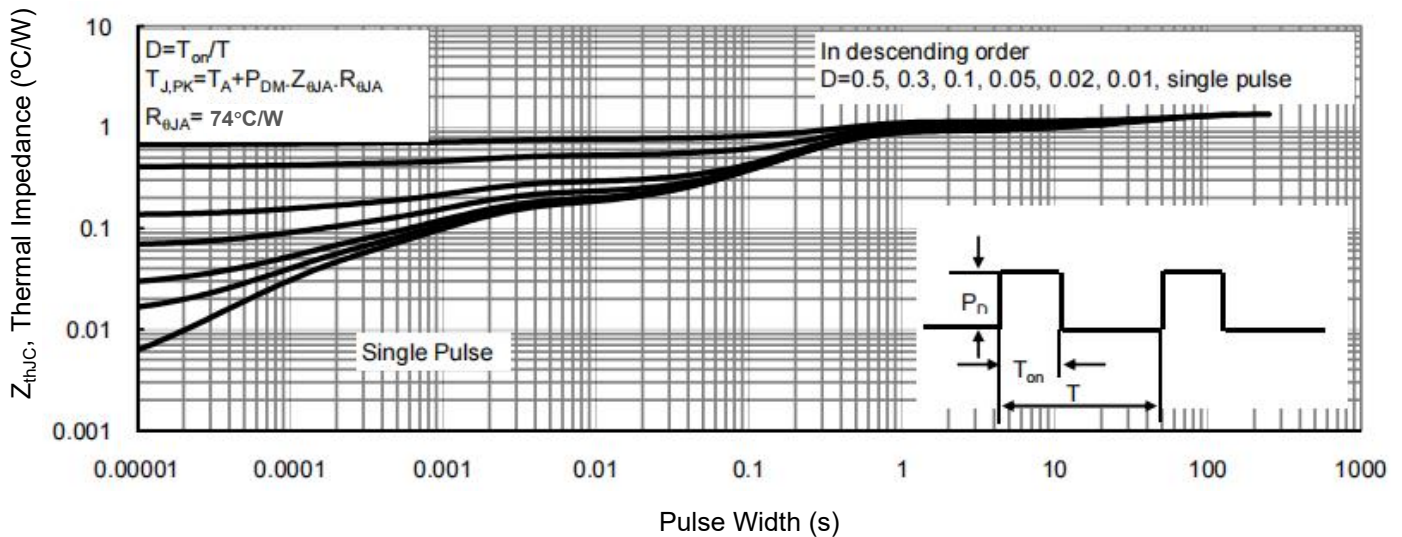
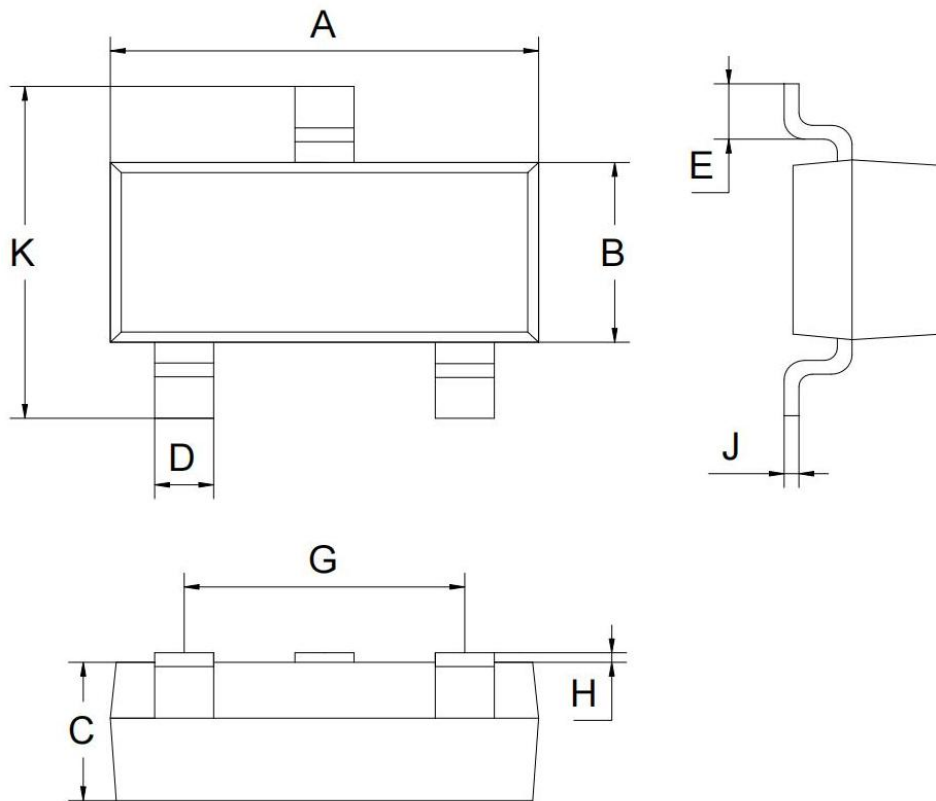


Figure 9. Normalized Maximum Transient Thermal Impedance



SOT-23 Package information



SOT-23			
Dim	MIN	NOM	MAX
A	2.80	2.90	3.00
B	1.20	1.30	1.40
C	0.90	1.00	1.10
D	0.39	0.40	0.45
E	0.20MIN		
G	1.90REF		
H	0.00	-	0.10
J	0.05	0.10	0.15
K	2.30	2.40	2.50
All Dimensions in mm			