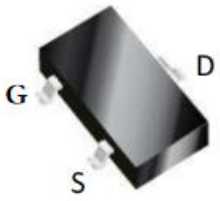
MU2302T

N-Channel Enhancement Mode MOSFET

Features

- 20V,4.0A
  $R_{DS(ON)}$(Typ.)=22mΩ@V_{GS} = 4.5V.
  $R_{DS(ON)}$(Typ.)=26mΩ@V_{GS} = 2.5V.
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free.



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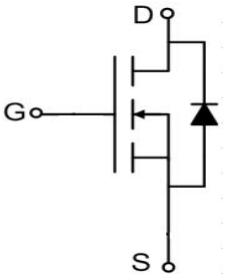

Applications

- Load Switch
- PWM Application
- Power Management

Absolute Maximum Ratings T_C = 25° C unless otherwise noted

Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	
I_D	Drain Current-Continuous	T_A =25°C	4.0	A
		T_A =100°C	2.5	
I_{DM}	Drain Current-Pulsed [a]		16	
P_D	Maximum Power Dissipation @ T_A =25°C		1.2	W
T_{STG}	Store Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max	103	°C/W

Electrical Characteristics T_J = 25° C unless otherwise noted

Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Forward Gate Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D =250μA	0.5	0.75	1.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance [d]	V_{GS} =4.5V, I_D =3A	-	22	28	mΩ
		V_{GS} =2.5V, I_D =3A	-	26	35	

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz	-	445	-	pF
Coss	Output Capacitance		-	64	-	
Crss	Reverse Transfer Capacitance		-	55	-	
Qg	Total Gate Charge	V_{GS} = 0 to 4.5V V_{DS} =10V,I_D=2A	-	6.0	-	nC
Qgs	Gate Source Charge		-	1.0	-	
Qgd	Gate Drain Charge		-	1.5	-	

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=15V, V_{GS} =4.5V I_D=3A, R_{GEN}=3Ω,	-	4	-	ns
t_r	Turn-On Rise Time		-	13	-	
$t_{d(off)}$	Turn-Off Delay Time		-	65	-	
t_f	Turn-Off Fall Time		-	33	-	

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current		-	-	4	A
I_{SM}	Maximum Pulsed Diode Forward Current		-	-	16	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD} = 4A	-	-	1.2	V
Trr	Body Diode Reverse Recovery Time	di/dt=60A/us I_F=2A	-	6.0	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	0.8	-	nC

Notes:

a：Max. current is limited by junction temperature.

b：Pulse test (pulse width≤300us, duty cycle≤2%).

Typical Characteristics

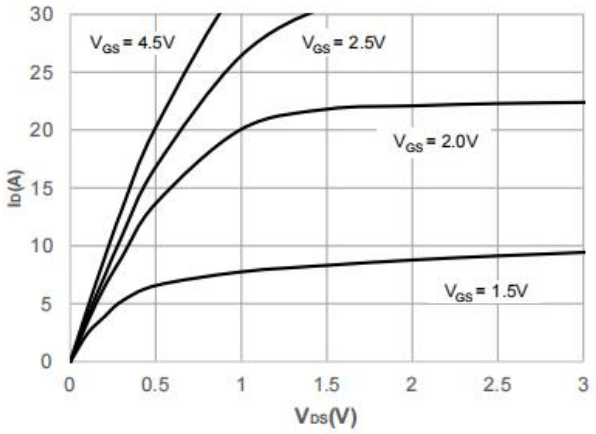

Figure 1. Output Characteristics

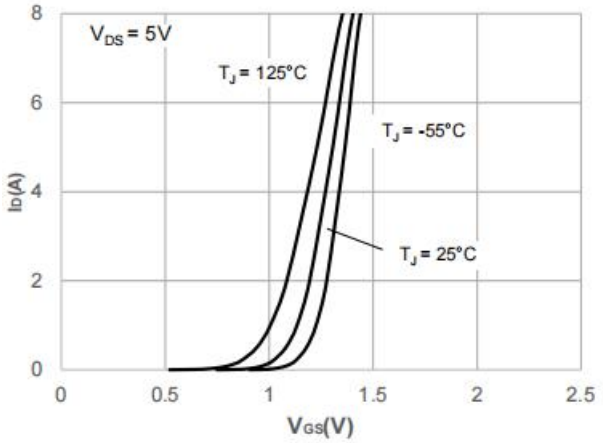

Figure2. Typical Transfer Characteristics

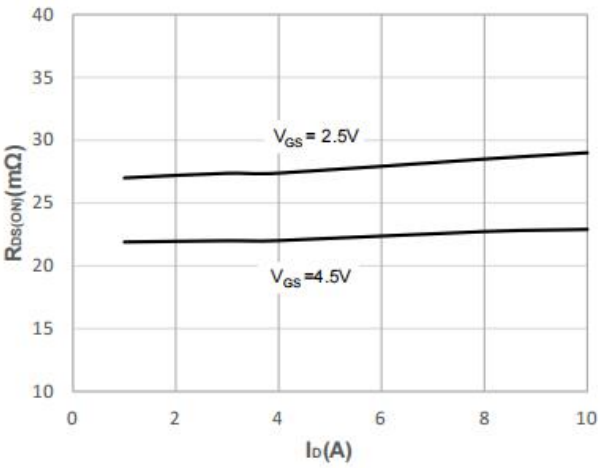

Figure 3. On-Resistance vs. Drain Current

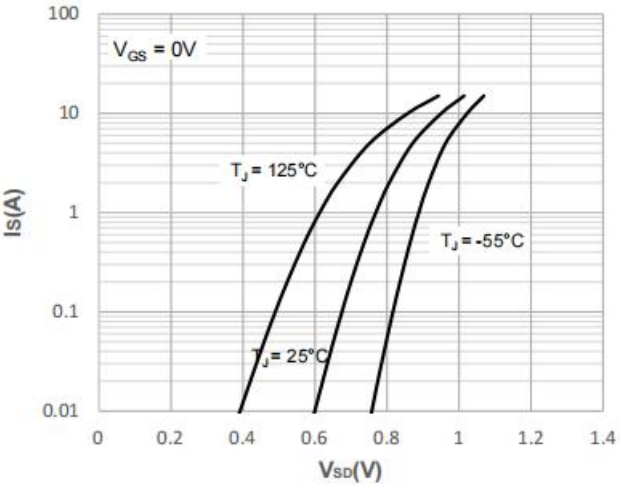

Figure 4.Body Diode Characteristics

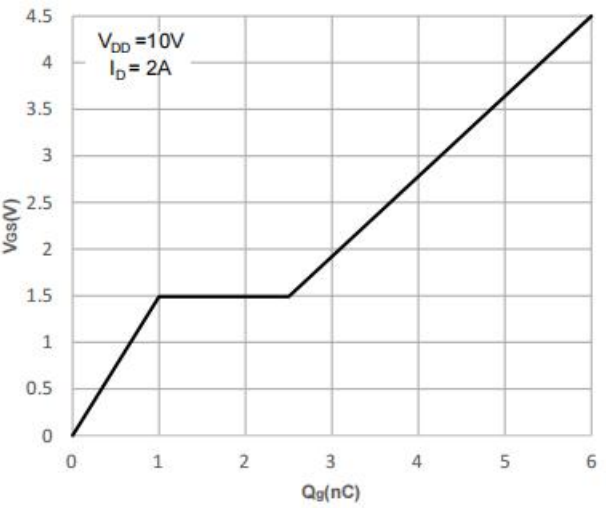

Figure 5.Gate Charge Characteristics

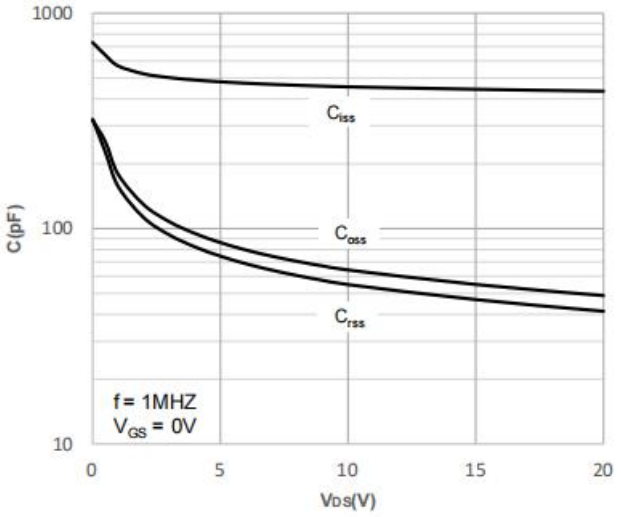

Figure 6.Capacitance Characteristics

Typical Characteristics

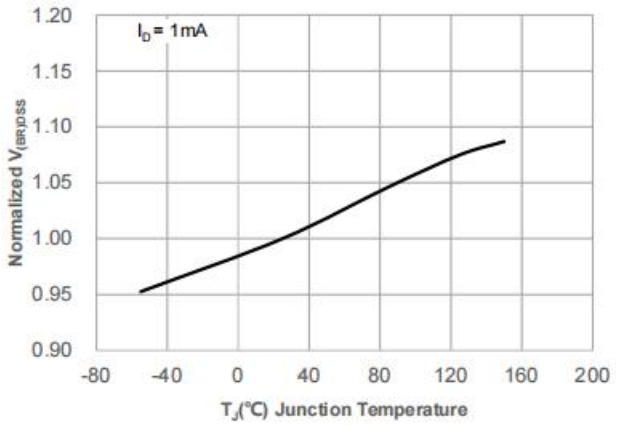

Figure 7.Normalized Breakdown voltage vs. Junction Temperature

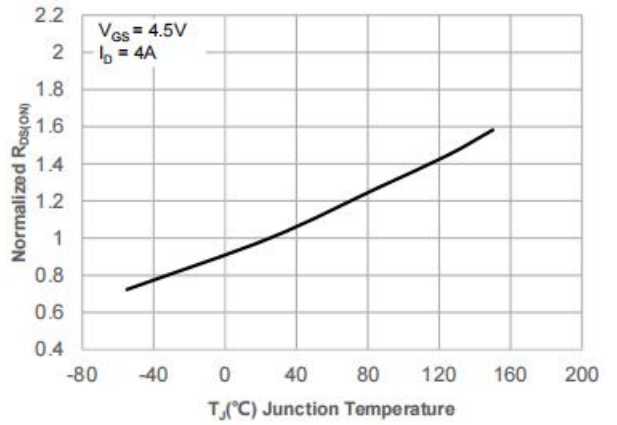

Figure 8. Normalized on Resistance vs. Junction Temperature

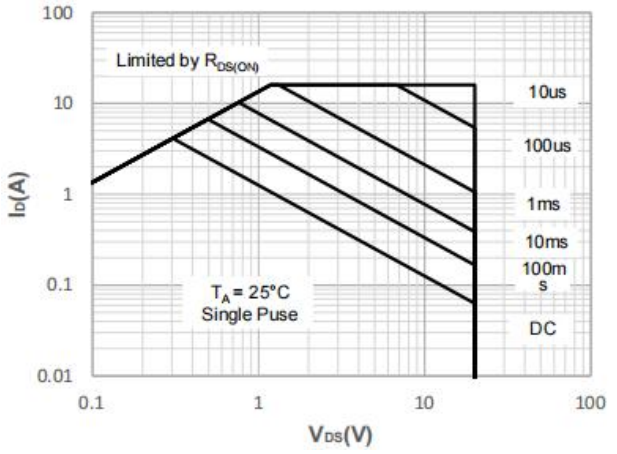

Figure 9.Maximum Safe Operating Area

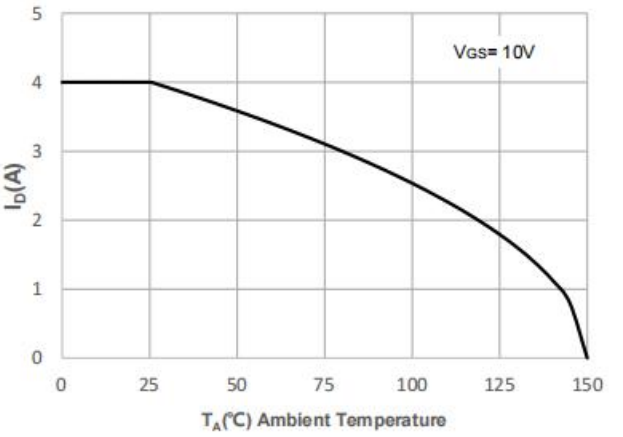

Figure 10.Maximum Continuous Drain Current vs. Ambient Temperature

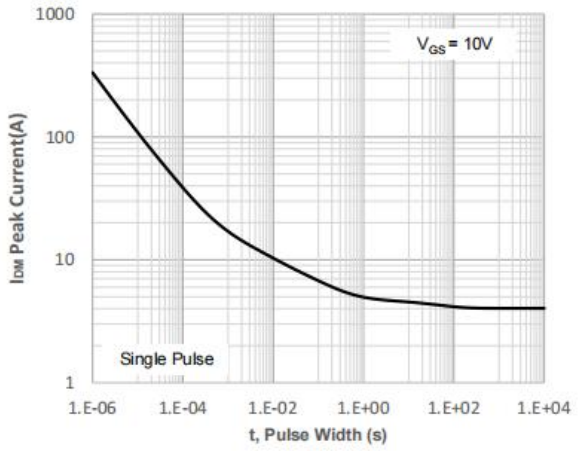

Figure 11. Peak Current Capacity

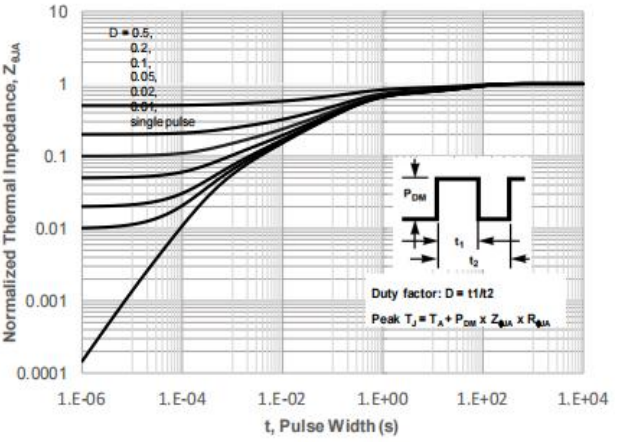

Figure 12: Normalized Maximum Transient Thermal Impedance

Marking Information

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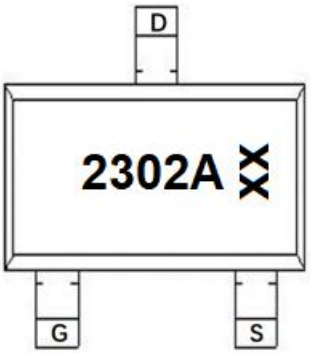

NOTE:

2302-Part number code

A-Version number code

XX-Week code