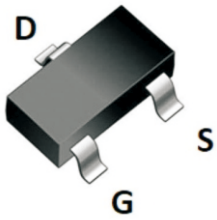
NM2302C

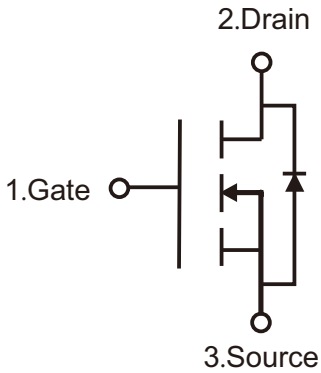
4.3A 20V N-CHANNEL MOSFET

SOT-23



Features

- $R_{DS(ON)}$ ≤ 30mΩ @ V_{GS}=4.5V
- $R_{DS(ON)}$ ≤ 45mΩ @ V_{GS}=2.5V
- Advancend Trench Technology
- Excellent $R_{DC(ON)}$ And Low Gate Charge
- Lead Free Prouduct Is Acquired



Application

- Load Switch
- PWM Application
- Power Management

Absolute Maximum Ratings (TA=25°C, unless otherwise specified)

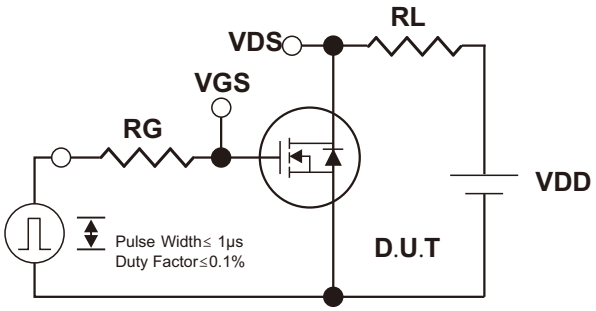
Parameter	Symbols	Ratings	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current	I_D	4.3	A
Pulsed Drain Current (Note 2)	I_{DM}	16	A
Power Dissipation	P_D	0.8	W
Thermal Resistance,Junction to Case	$R_{\theta JA}$	156	°CW
Operation Junction Temperature and Storage Temperature	T_j, T_{stg}	-55 ~ +150	°C

Electrical Characteristics (TA=25°C, unless otherwise specified)

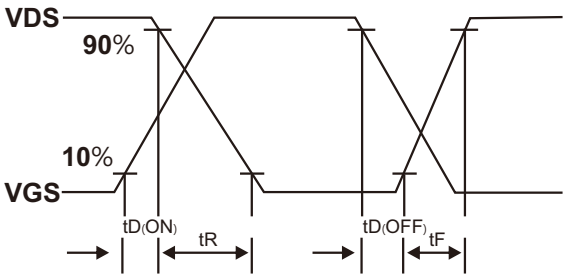
Parameter		Symbols	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		B_{VDSS}	V_{GS}=0V,I_D=250uA	20	22		V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V,V_{GS}=0V	0.5	0.7	1	uA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=12V,V_{DS}=0V			100	nA
	Reverse		V_{GS}=-12V,V_{DS}=0V			-100	
On Characteristics							
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.5	0.7	1.1	V
Static Drain-Source On-State Resistance (Note1)		$R_{DS(ON)}$	V_{GS}=4.5V,I_D=4A		22	30	mΩ
			V_{GS}=2.5V,I_D=3A		30	45	mΩ
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS}=10V,		358		pF
Output Capacitance		C_{oss}	V_{GS}=0V,		69.3		pF
Reverse Transfer Capacitance		C_{rss}	f=1.0MHz		58.5		pF
Switching Characteristics							
Total Gate Charge		Q_g	V_{DS}=10V,V_{GS}=4.5V, ID=2A		5.6		nC
Gate-Source Charge		Q_{gs}			0.8		nC
Gate-Drain Charge		Q_{gd}			1		nC
Turn-On Delay Time		$t_{d(on)}$	V_{DS}=10V,V_{GS}=4.5V, I_D=4.0A,R_{GEN}=3Ω		16		ns
Turn-On Rise Time		t_r			51		ns
Turn-Off Delay Time		$t_{d(off)}$			21		ns
Turn-Off Fall Time		t_f			19		ns
Drain-Source Diode Characteristics And Maximum Ratings							
Maximum Body-Diode Continuous Current		I_S				4	A
Maximum Body-Diode Pulsed Current		I_{SM}				16	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=4A,V_{GS}=0V			1.2	V

Notes:
1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 0.5%.
2. Repetitive Rating:Pulse Width Linited by Maximum Junction Temperature

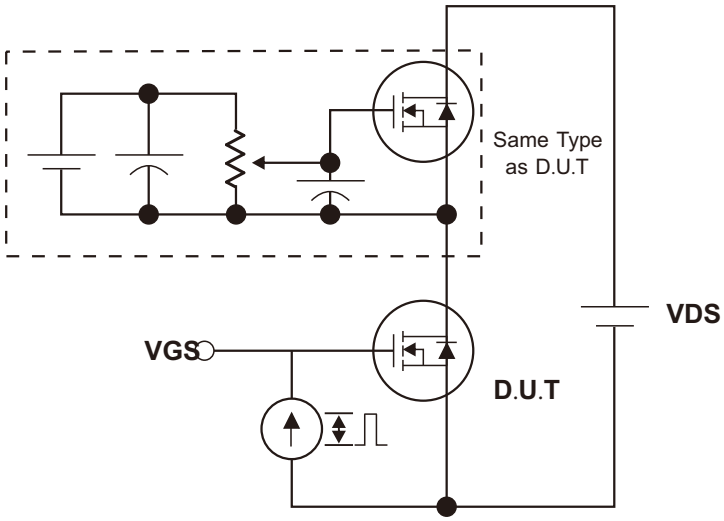
Test Circuits and waveforms



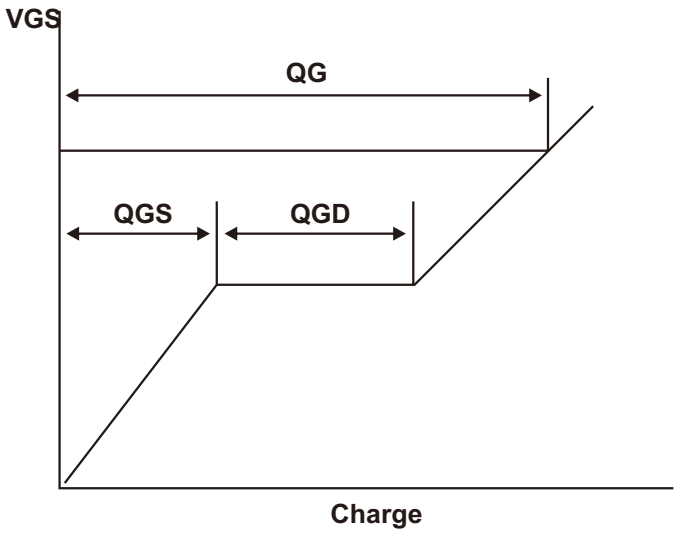
Switching Test Circuit



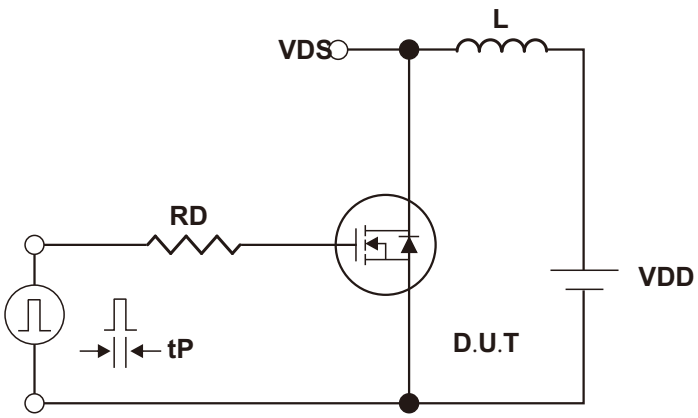
Switching Waveforms



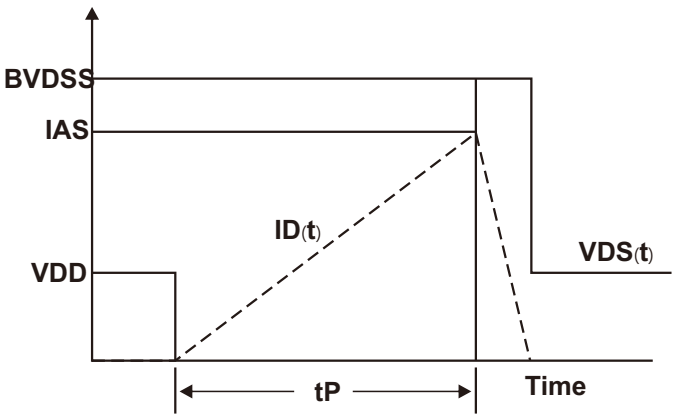
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Typical Characteristics

Fig.1 Output Characteristics

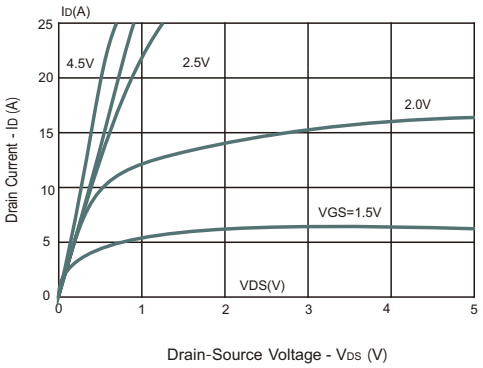


Fig.2 Typical Transfer Characteristics

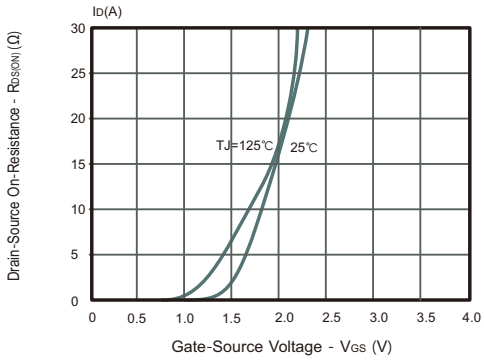


Fig.3 Drain-Source On-Resistance vs. Drain Current

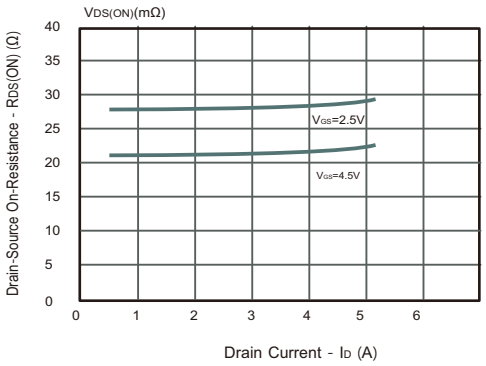


Fig.4 Body Diode Characteristics

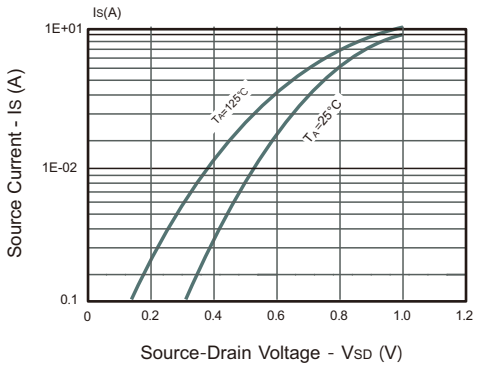


Fig.5 Gate Charge Characteristics

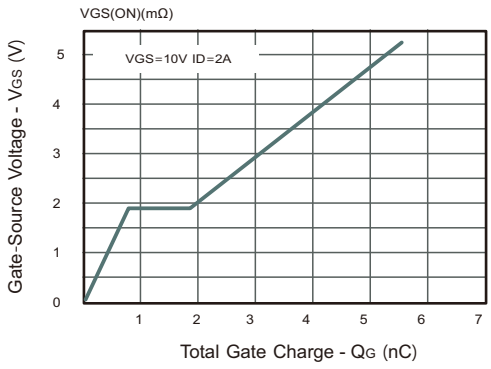


Fig.6 Capacitance Characteristics

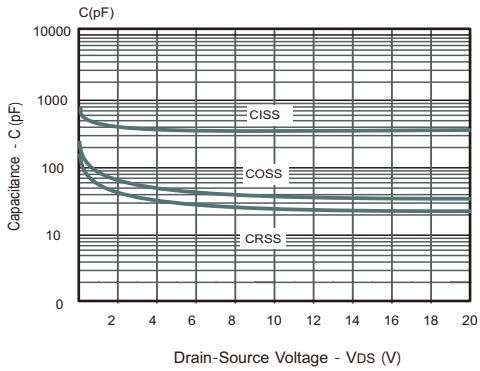


Fig.7 Breakdown Voltage vs. Junction Temperature

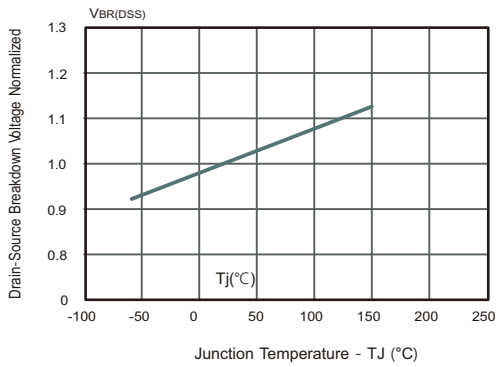
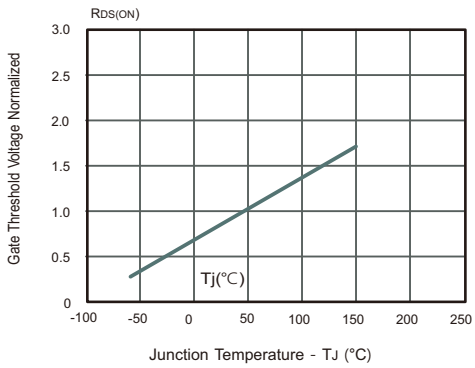


Fig.8 Normalized on Resistance vs.Junction Temperature



Typical Characteristics

Fig.9 Safe Operating Area

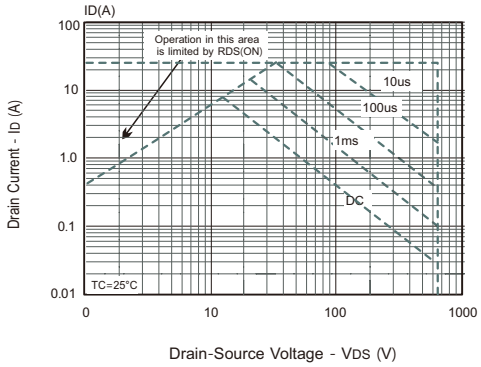
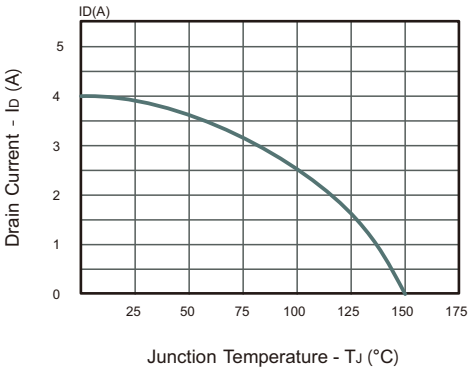
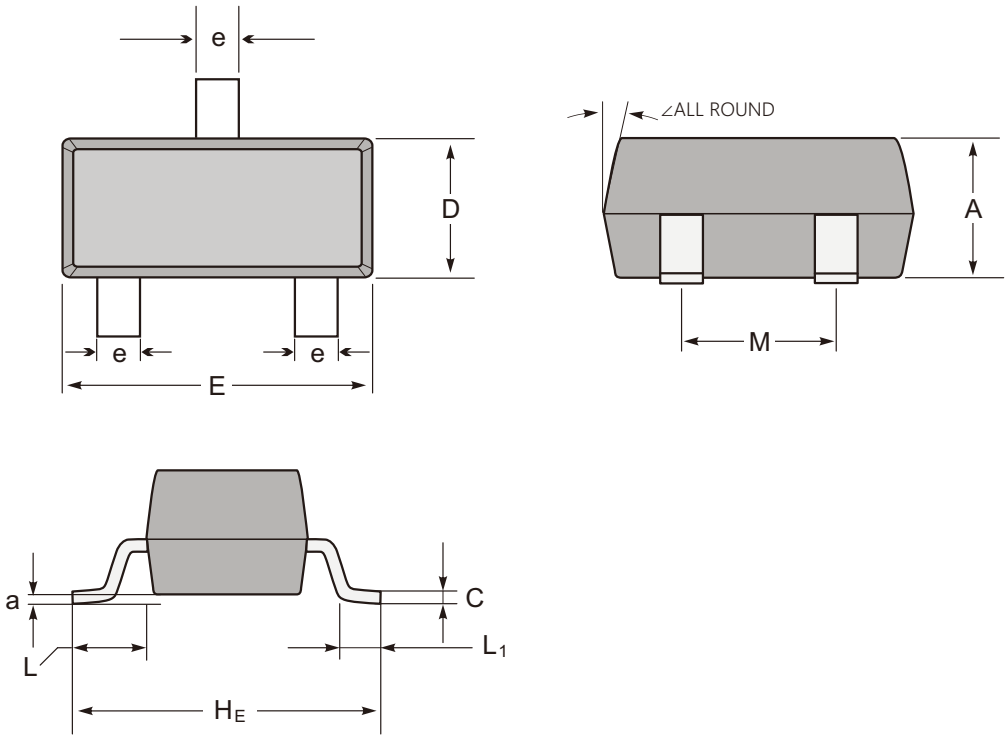


Fig.10 Drain Current vs. Ambient Temperature



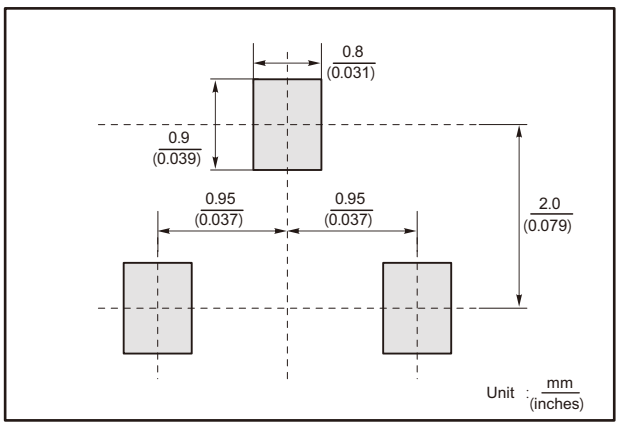
SOT-23 Package Outline Dimensions



SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a	∠
mm	max	1.1	0.20	1.4	3.0	2.6	0.6	1.95	0.55 (ref)	0.36 (ref)	0.15	12°
	min	0.9	0.08	1.2	2.8	2.2	0.35	1.7			0.0	
mil	max	43	7.9	55	118	102	24	77	22 (ref)	14 (ref)	6	
	min	35	3.1	47	110	87	13	67			0.0	

The recommended mounting pad size



Marking

Type number	Marking code
NM2302C	2302C

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