MS34N02

N-Channel 30-V (D-S) MOSFET

Description

The MS34N02 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the small power switching and load switch applications.

The device meets the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Low $R_{DS(ON)}$
- Green Device Available

Typical Applications

- Battery Protection
- Load Switch
- Hand-held Instrument

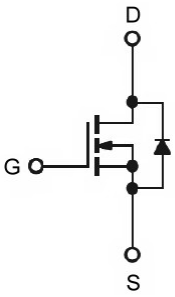
Package type：SOT-23

Packing & Order Information

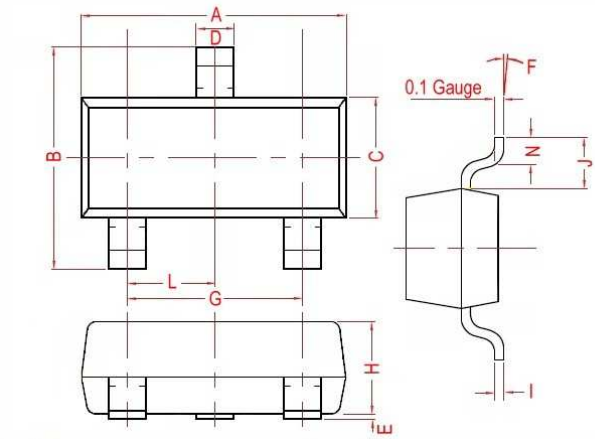
3,000/Reel

RoHS Compliant

Graphic Symbol

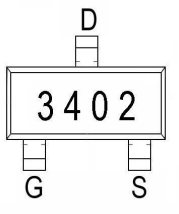


Package Dimension



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90 Ref.	
B	2.30	3.00	H	0.90	1.30
C	1.20	1.75	I	0.05	0.21
D	0.30	0.50	J	0.58 Ref.	
E	0.01	0.15	L	0.95 Typ.	
F	0°	10°	N	0.20 Min.	

Marking



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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[3] (T_A=25°C)	4.6	A
	Continuous Drain Current[3] (T_A=70°C)	3.7	A
I_{DM}	Pulsed Drain Current[1,2] (T_A=25°C)	16	A
P_D	Power Dissipation (T_A=25°C)	1.38	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient[3]	90	°C/W

Electrical Characteristics(T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GS\ (th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	-	2.5	V
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	-	-	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=4.6A	-	5	-	S
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V, V_{GS}=0V, T_J=25°C V_{DS}=24V, V_{GS}=0V, T_J=55°C	-	-	1 5	μA
$R_{DS\ (on)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=4.6A V_{GS}=4.5V, I_D=4.0A	- -	- -	28 40	mΩ
V_{SD}	Diode Forward Voltage[2]	I_S=1.25A, V_{GS}=0V, T_J=25°C	-	-	1.2	V
I_S	Continuous Source Current **(Diode)**	V_G=V_D=0V, Force Current	-	-	4.6	A
I_{SM}	Pulsed Source Current **(Diode)**		-	-	9.2	

Notes

1. Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board; 270℃/W when mounted on min. copper pad.

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Dynamic and switching Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Q_g	Total Gate Charge[2]	V_{DS} =15V	--	15.8	--	nC
Q_{gs}	Gate-Source Charge	I_D =4.6A	--	2	--	
Q_{gd}	Gate-Drain Charge	V_{GS} =10V	--	3	--	
$t_{d(on)}$	Turn-On Delay Time	V_{DS} =15V	--	4.8	--	ns
t_r	Rise Time	I_D =1A	--	3.9	--	
$t_{d(off)}$	Turn-Off Delay Time	V_{GS} =10V	--	27.7	--	
t_f	Fall Time	R_G =6.0Ω, R_L =15Ω	--	5.5	--	
C_{ISS}	Input Capacitance	V_{DS} =15V	--	782	--	pF
C_{OSS}	Output Capacitance	V_{GS} =0V	--	135	--	
C_{RSS}	Reverse Transfer Capacitance	f =1.0MHz	--	93	--	

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- **Typical Electrical Characteristics**

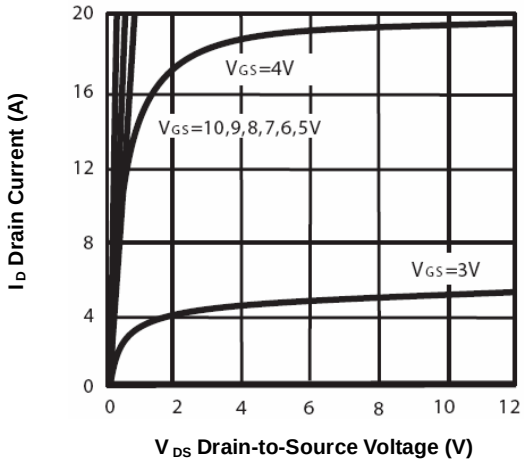

FIG.1-Typical Output Characteristics

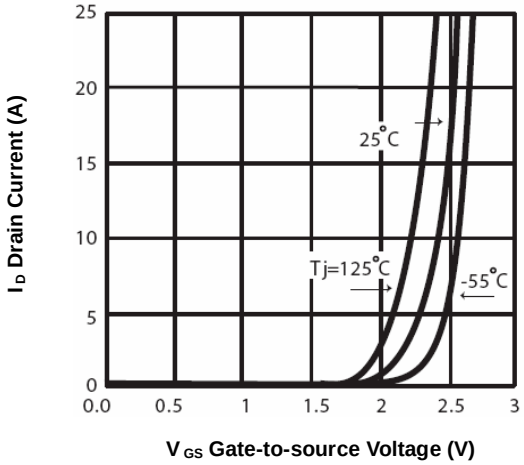

FIG.2-Transfer Characteristics

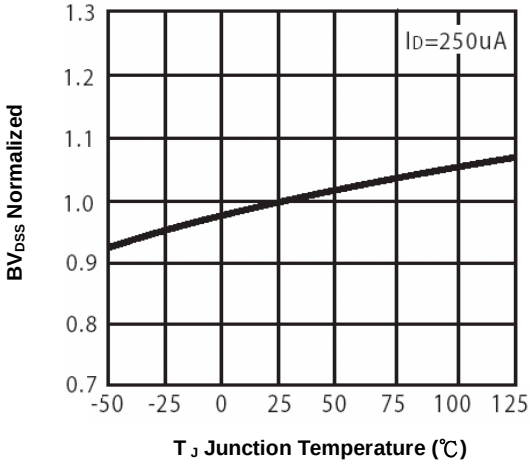

FIG.3-Breakdown Voltage vs. T_J

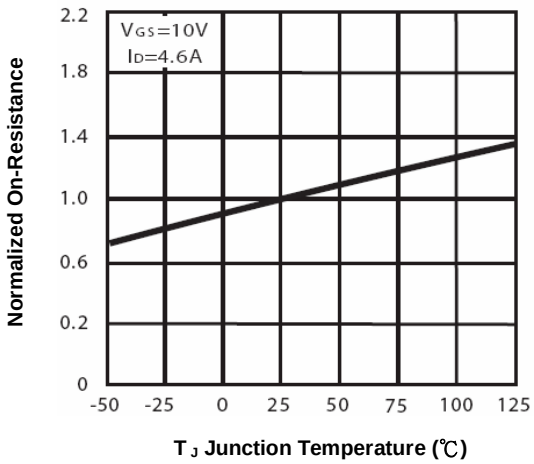

FIG.4-Normalized R_{DSON} vs. T_J

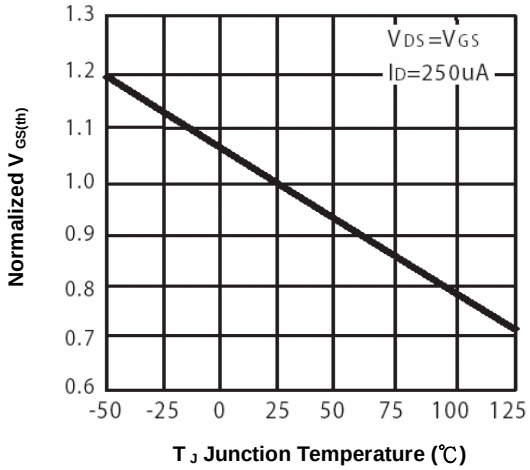

FIG.5-Normalized $V_{GS(th)}$ vs. T_J

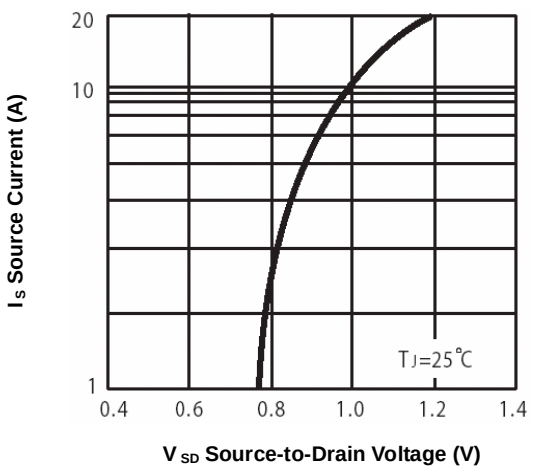

FIG.6-Forward Characteristics of Reverse

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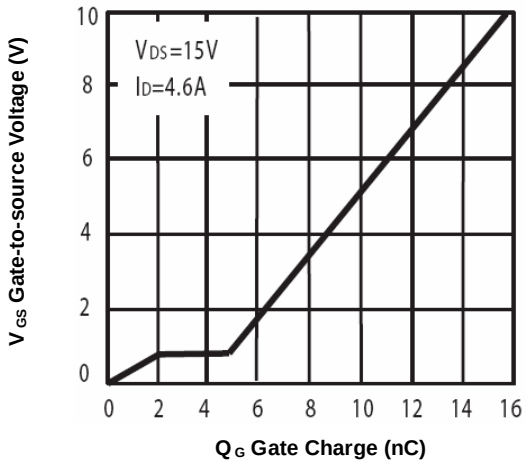

FIG.7-Gate Charge Characteristics

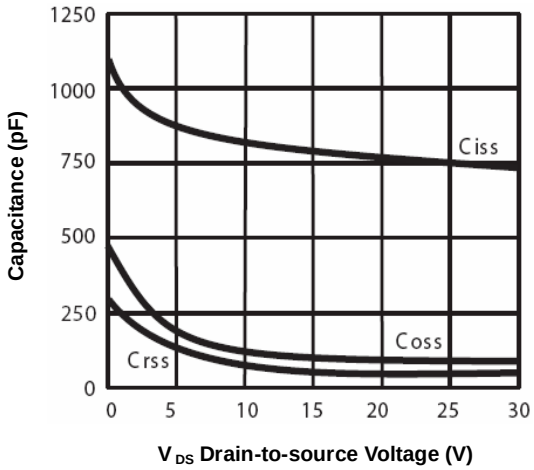

FIG.8-Capacitance Characteristics

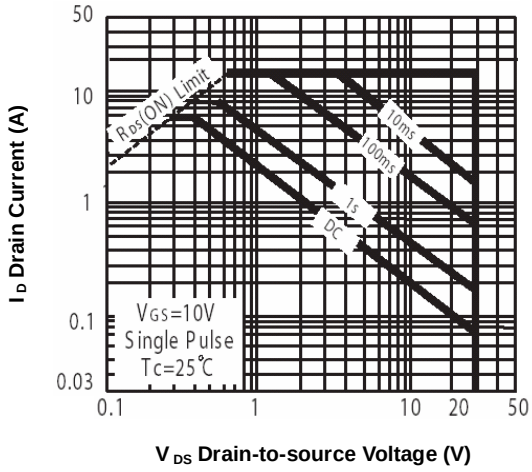

FIG.9-Safe Operating Area

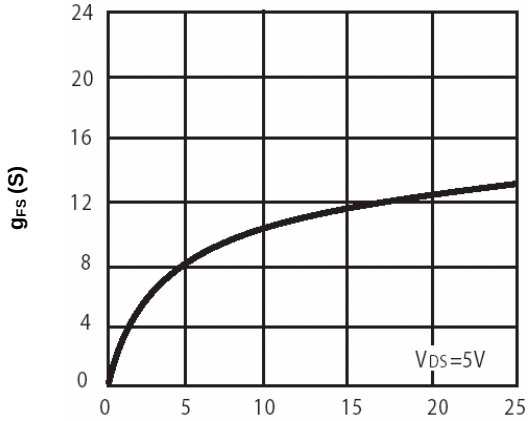

FIG.10-Transconductance vs. I_D

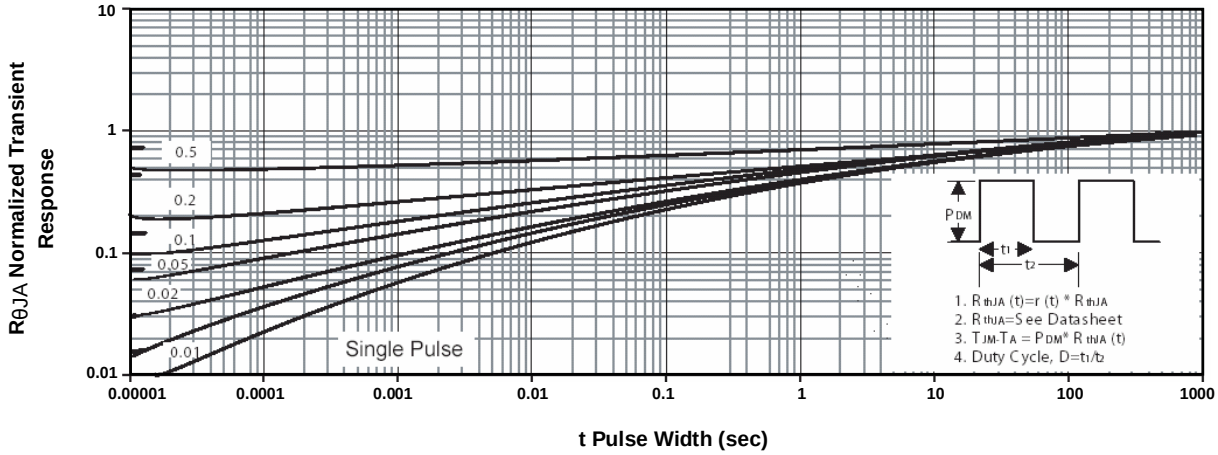

FIG.11-Normalized Maximum Transient Thermal Impedance

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