

MS34P01

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

Description

The MS34P01 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The device is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

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

Features

- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Low Gate Charge
- Green Device Available

Typical Applications

- Battery Protection
- Load Switch
- Hand-held Instrument

Package type : SOT-23

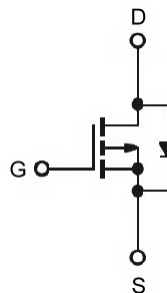
Packing & Order Information

3,000/Reel

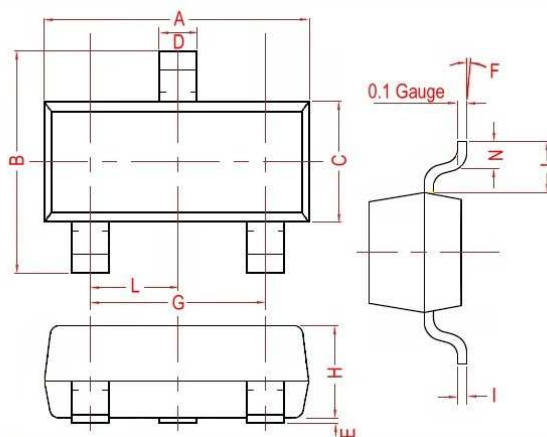


RoHS Compliant

Graphic Symbol

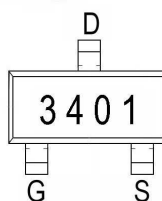


Package Dimension



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	± 12	V
I_D	Continuous Drain Current ³ ($T_A=25^\circ\text{C}$)	-4.2	A
	Continuous Drain Current ³ ($T_A=70^\circ\text{C}$)	-3.5	A
I_{DM}	Pulsed Drain Current ^{1,2} ($T_A=25^\circ\text{C}$)	-20	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.38	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ³	90	$^\circ\text{C/W}$

Electrical Characteristics($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-0.5	-	-1.3	V
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=-250\mu\text{A}$	-30	-	-	V
g_{fs}	Forward Transconductance	$V_{DS}=-5\text{V}$, $I_D=-3\text{A}$	-	9	-	S
I_{GSS}	Gate-Source Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 12\text{V}$	-	-	± 100	nA
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$	-	-	-5	
$R_{DS(on)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10\text{V}$, $I_D=-4.2\text{A}$	-	-	53	m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-4.0\text{A}$	-	-	65	
		$V_{GS}=-2.5\text{V}$, $I_D=-1.0\text{A}$	-	-	120	
V_{SD}	Diode Forward Voltage ²	$I_S=-1.2\text{A}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$	-	-	-1.0	V
I_S	Continuous Source Current (Diode)	$V_G=V_D=0\text{V}$, Force Current	-	-	-4.2	A
I_{SM}	Pulsed Source Current (Diode)		-	-	-8.4	

Notes

1. Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 270°C/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	$V_{DS} = -15V$	--	9.4	--	nC
Q_{gs}	Gate-Source Charge	$I_D = -4A$	--	2	--	
Q_{gd}	Gate-Drain Charge	$V_{GS} = -4.5V$	--	3	--	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = -15V$	--	6.3	--	ns
t_r	Rise Time	$V_{GS} = -10V$	--	3.2	--	
$t_{d(off)}$	Turn-Off Delay Time	$R_G = 6.0\Omega$	--	38.2	--	
t_f	Fall Time	$R_L = 3.6\Omega$	--	12	--	
C_{ISS}	Input Capacitance	$V_{DS} = -15V$	--	954	--	pF
C_{OSS}	Output Capacitance	$V_{GS} = 0V$	--	115	--	
C_{RSS}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	77	--	

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Typical Electrical Characteristics

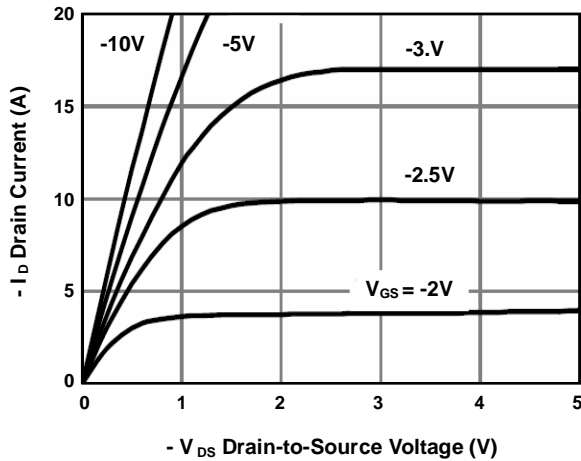


FIG.1-Typical Output Characteristics

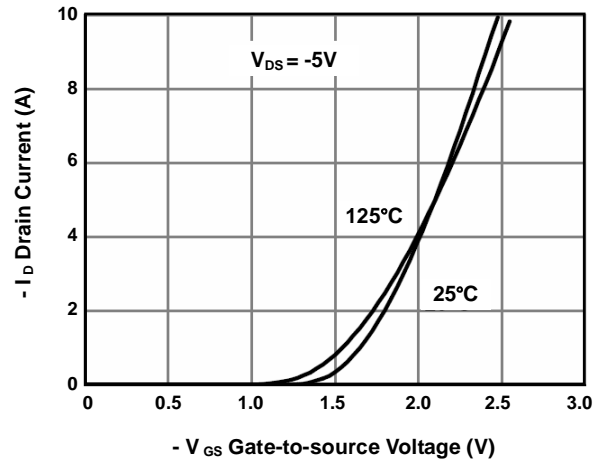


FIG.2-Transfer Characteristics

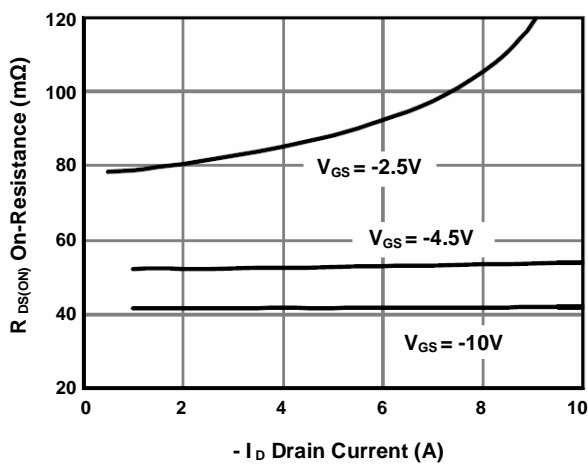


FIG.3-On-Resistance vs. Drain Current

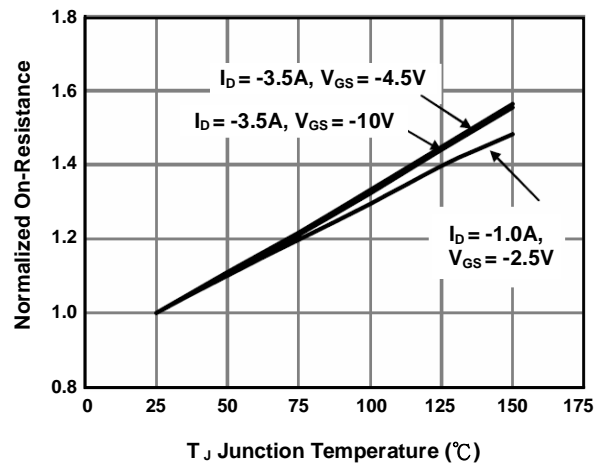


FIG.4-Normalized $R_{DS(on)}$ vs. T_J

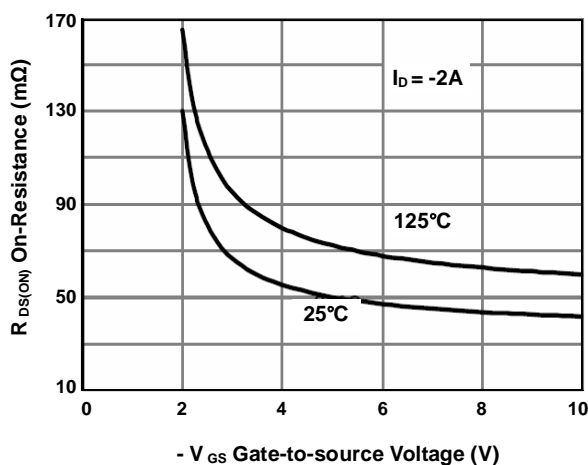


FIG.5-On-Resistance vs. G-S Voltage

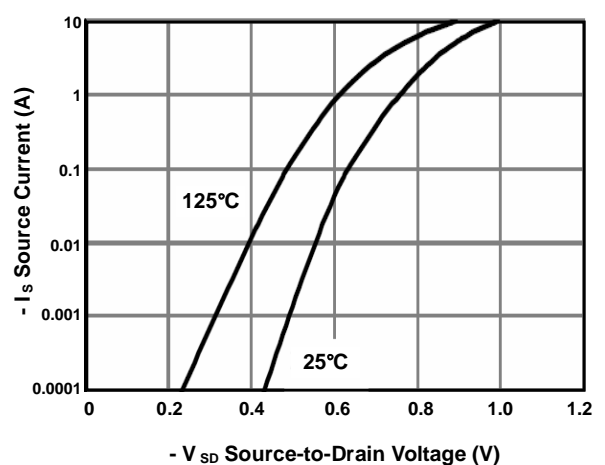


FIG.6-Forward Characteristics of Reverse

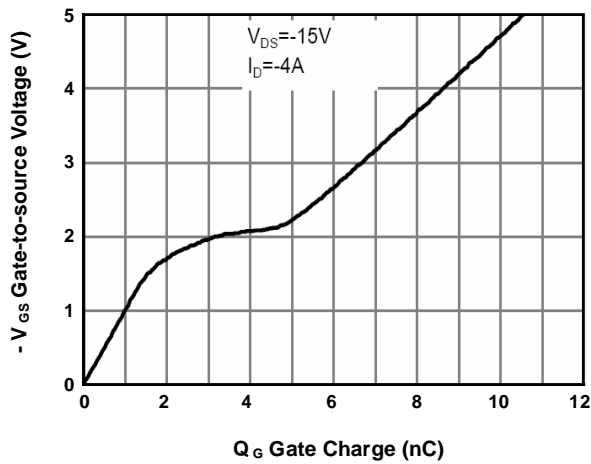


FIG.7-Gate Charge Characteristics

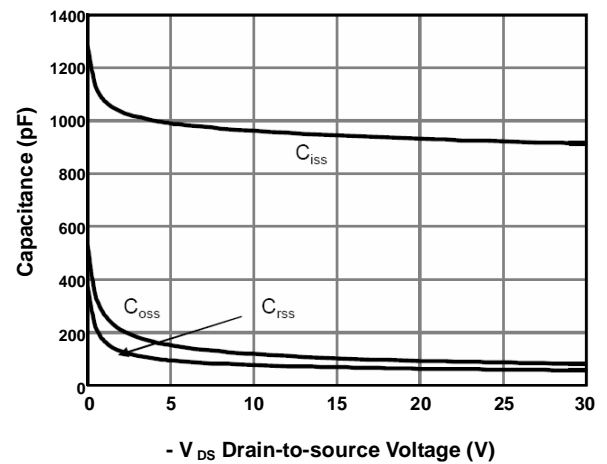


FIG.8-Capacitance Characteristics

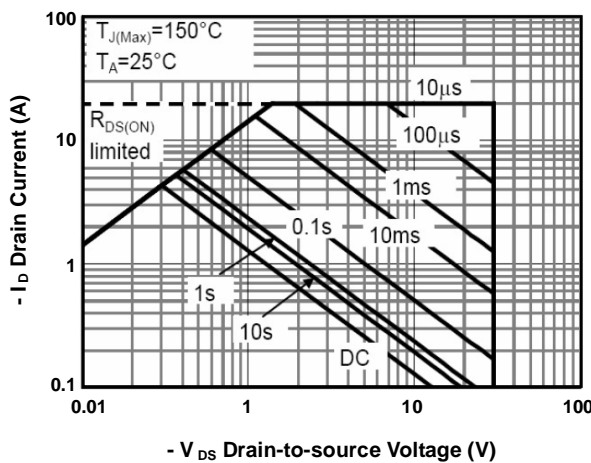


FIG.9-Safe Operating Area

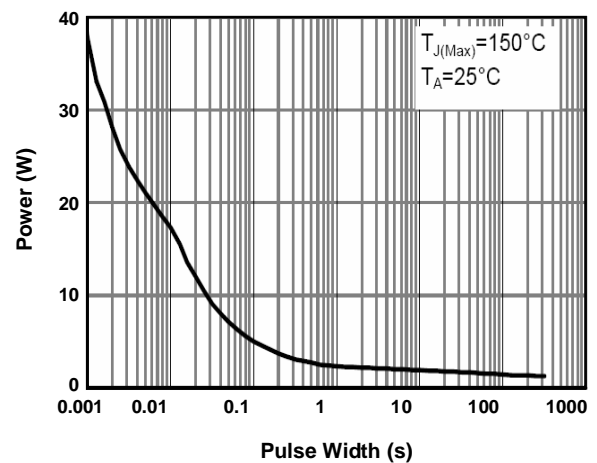


FIG.10-Single Pulse Power Rating vs. T_A

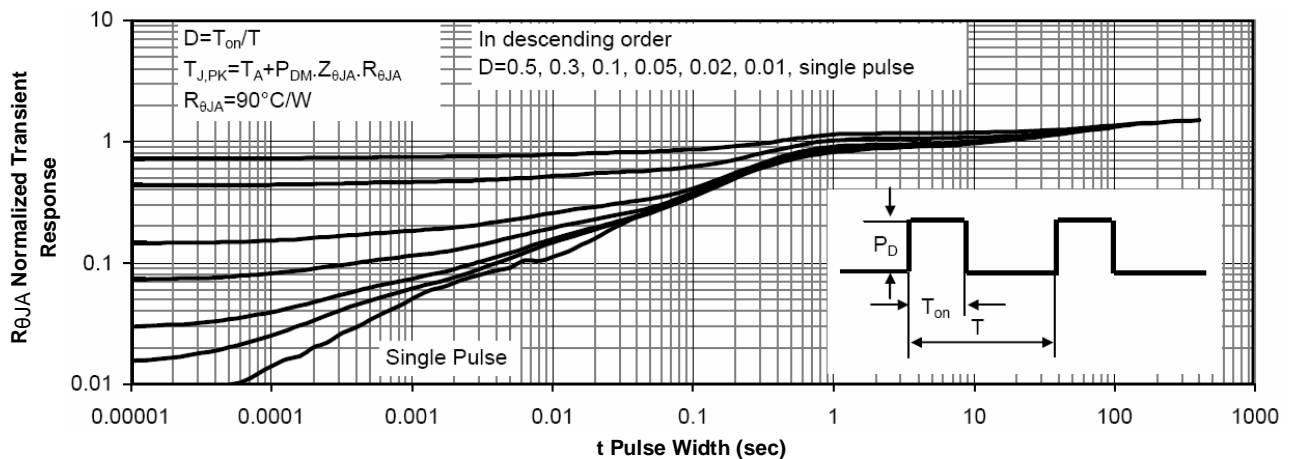


FIG.11-Normalized Maximum Transient Thermal Impedance

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