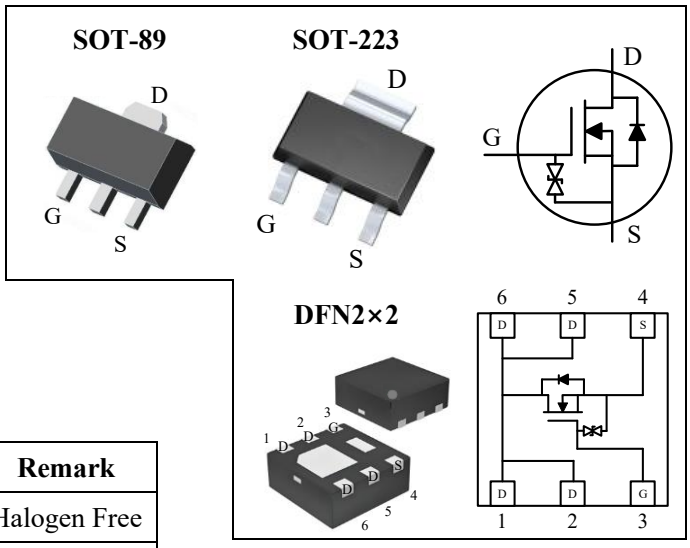
100V N-Channel Depletion-Mode Power MOSFET

General Features

- Depletion Mode (Normally-on)
- Proprietary Advanced Planar Technology
- Rugged Polysilicon Gate Cell Structure
- Fast Switching Speed
- ESD Improved Capability
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(on)(Max.)}$	$I_{DSS(Min.)}$
100V	**3.0Ω**	**0.3A**



Applications

- Suppressing Surge Current
- Normally-on Switches
- Constant Current Source
- Protection Circuits

Ordering Information

Part Number	Package	Marking	Remark
DMX1072	SOT-89	1072	Halogen Free
DMS1072	SOT-223	1072	Halogen Free
DMF1072	DFN2×2	1072	Halogen Free

Absolute Maximum Ratings

T_A = 25°C unless otherwise specified

Symbol	Parameter	DMX1072	DMS1072	DMF1072	Unit
V_{DSX}	Drain-to-Source Voltage [1]	100			V
V_{DGX}	Drain-to-Gate Voltage [1]	100			V
V_{GS}	Gate-to-Source Voltage	±20			V
I_D	Continuous Drain Current [2]	0.3			A
I_{DM}	Pulsed Drain Current [3]	1.2			A
P_D	Power Dissipation [4]	1.0	1.5	2.5	W
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300			°C
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150			°C

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	DMX1072	DMS1072	DMF1072	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	125	83	50	°C/W

Electrical Characteristics

OFF Characteristics

T_A = 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	100	--	--	V	V_{GS} = -5V, I_D = 250μA
$I_{D(off)}$	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS} = 100V, V_{GS} = -5V
		--	--	1	mA	V_{DS} = 100V, V_{GS} = -5V T_J = 125°C
I_{GSS}	Gate-to-Source Leakage Current	--	--	20	μA	V_{GS} = 20V, V_{DS} = 0V
		--	--	-20		V_{GS} = -20V, V_{DS} = 0V

ON Characteristics

T_A = 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
I_{DSS}	Saturated Drain-to-Source Current	0.3	--	--	A	V_{GS} = 0V, V_{DS} = 25V
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	--	--	3.0	Ω	V_{GS} = 0V, I_D = 0.15A [5]
		--	--	2.8	Ω	V_{GS} = 5V, I_D = 0.15A [5]
$V_{GS(off)}$	Gate-to-Source Cut-off Voltage	-3.3	--	-1.5	V	V_{DS} = 3V, I_D = 8μA
g_{fs}	Forward Transconductance	--	0.46	--	S	V_{DS} = 20V, I_D = 0.15A

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	81.3	--	pF	V_{GS} = -5V, V_{DS} = 25V, f = 1.0MHz
C_{oss}	Output Capacitance	--	32.7	--		
C_{rss}	Reverse Transfer Capacitance	--	6.6	--		
Q_g	Total Gate Charge	--	2.52	--	nC	V_{GS} = -5 to 5V, V_{DS} = 50V, I_D = 0.15A
Q_{gs}	Gate-to-Source Charge	--	0.69	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	0.7	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	6.2	--	ns	V_{GS} = -5 to 5V, V_{DD} = 50V, I_D = 0.15A, R_G = 10Ω
t_r	Rise Time	--	4.8	--		
$t_{d(off)}$	Turn-off Delay Time	--	11.6	--		
t_f	Fall Time	--	17	--		

Source-Drain Diode Characteristics

T_A = 25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_{SD} = 0.15A, V_{GS} = -10V

NOTE：

[1] T_J = +25℃ to +150℃.
[2] V_{GS} = 0V.
[3] Repetitive rating, pulse width limited by maximum junction temperature.
[4] T_C = +25℃.
[5] Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

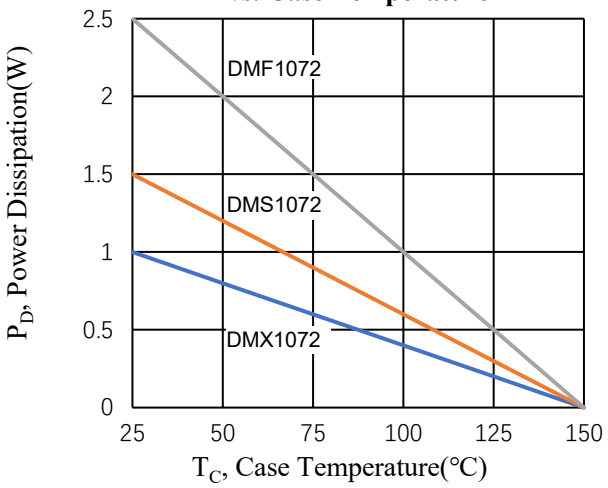


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

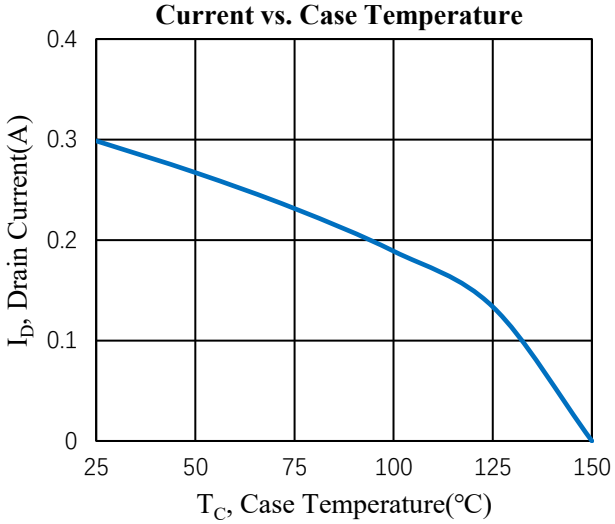


Figure 3.Typical Output Characteristics

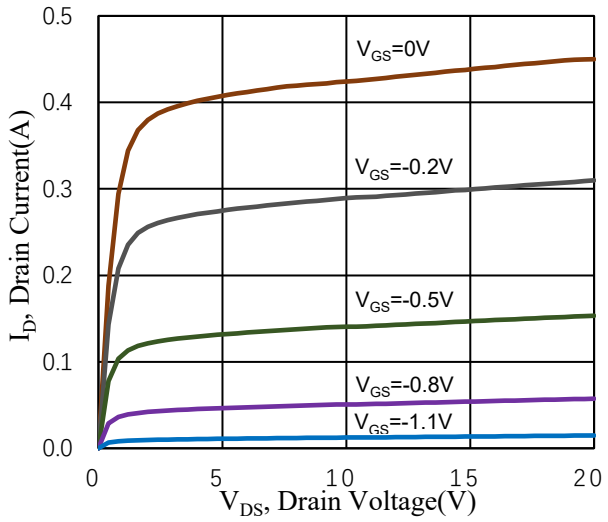


Figure 4. Typical Transfer Characteristics

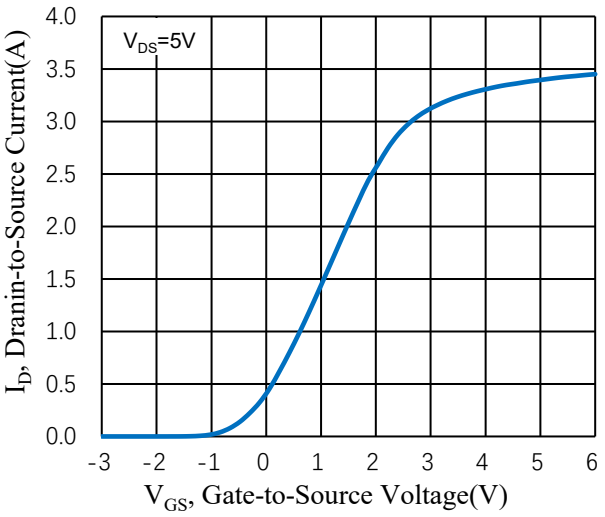
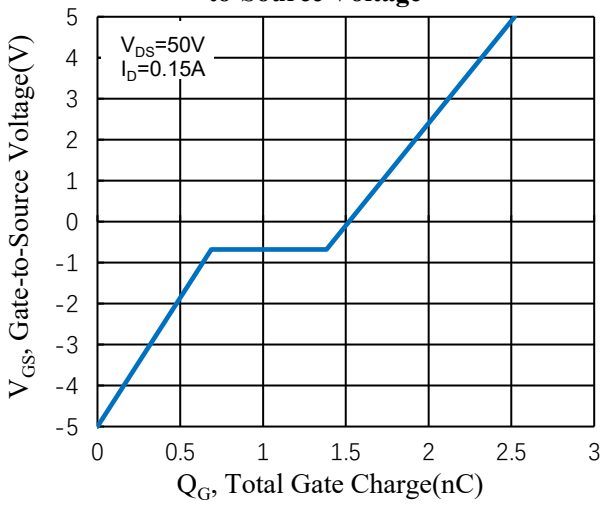
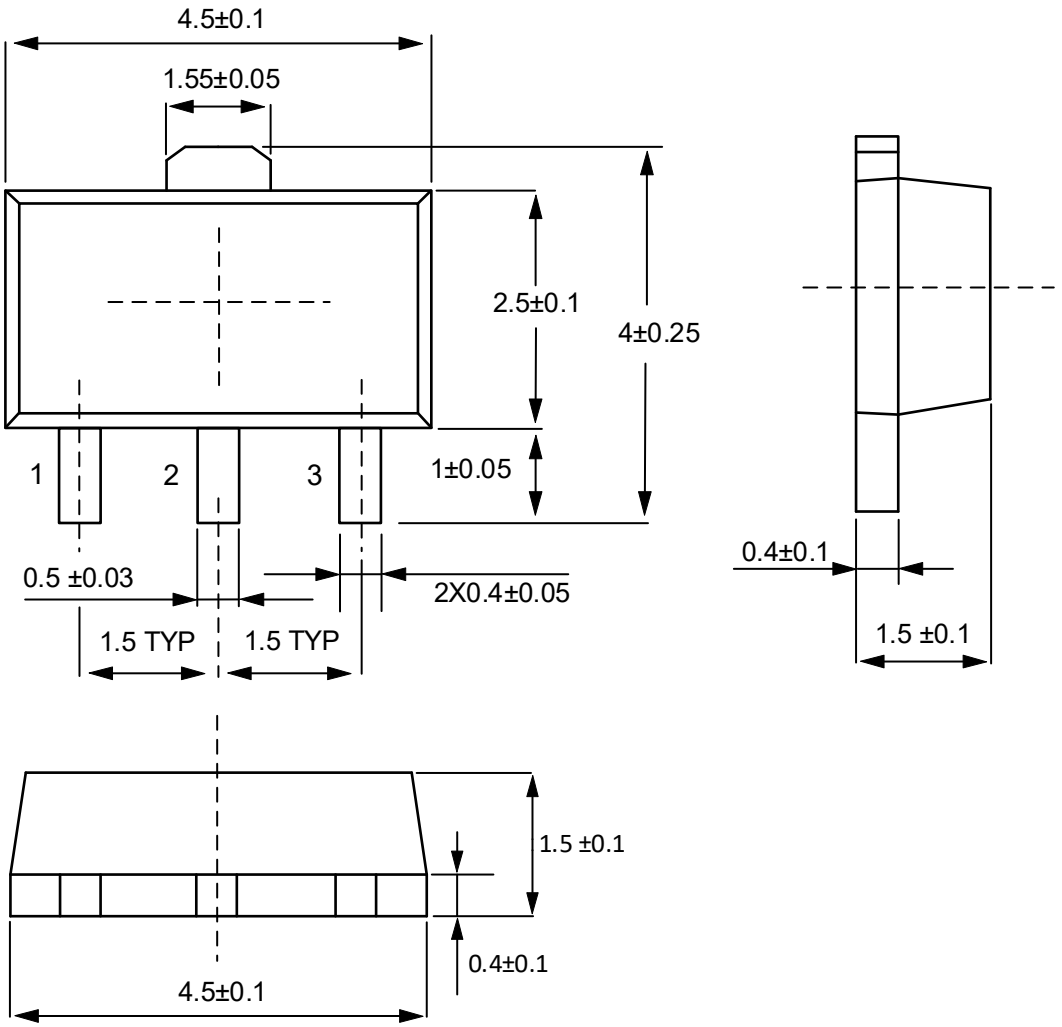


Figure 5. Typical Gate Charge vs. Gate-to-Source Voltage



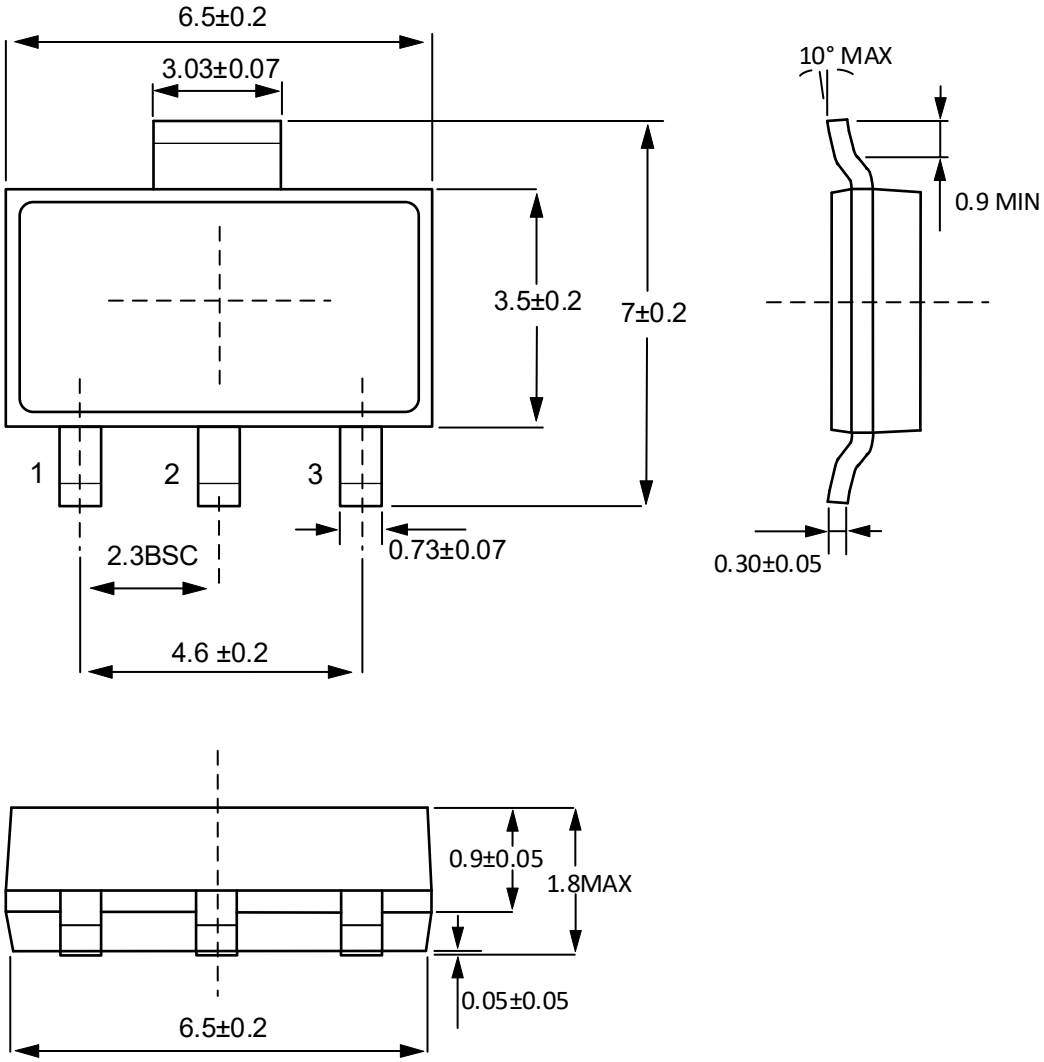
Package Dimensions

SOT-89



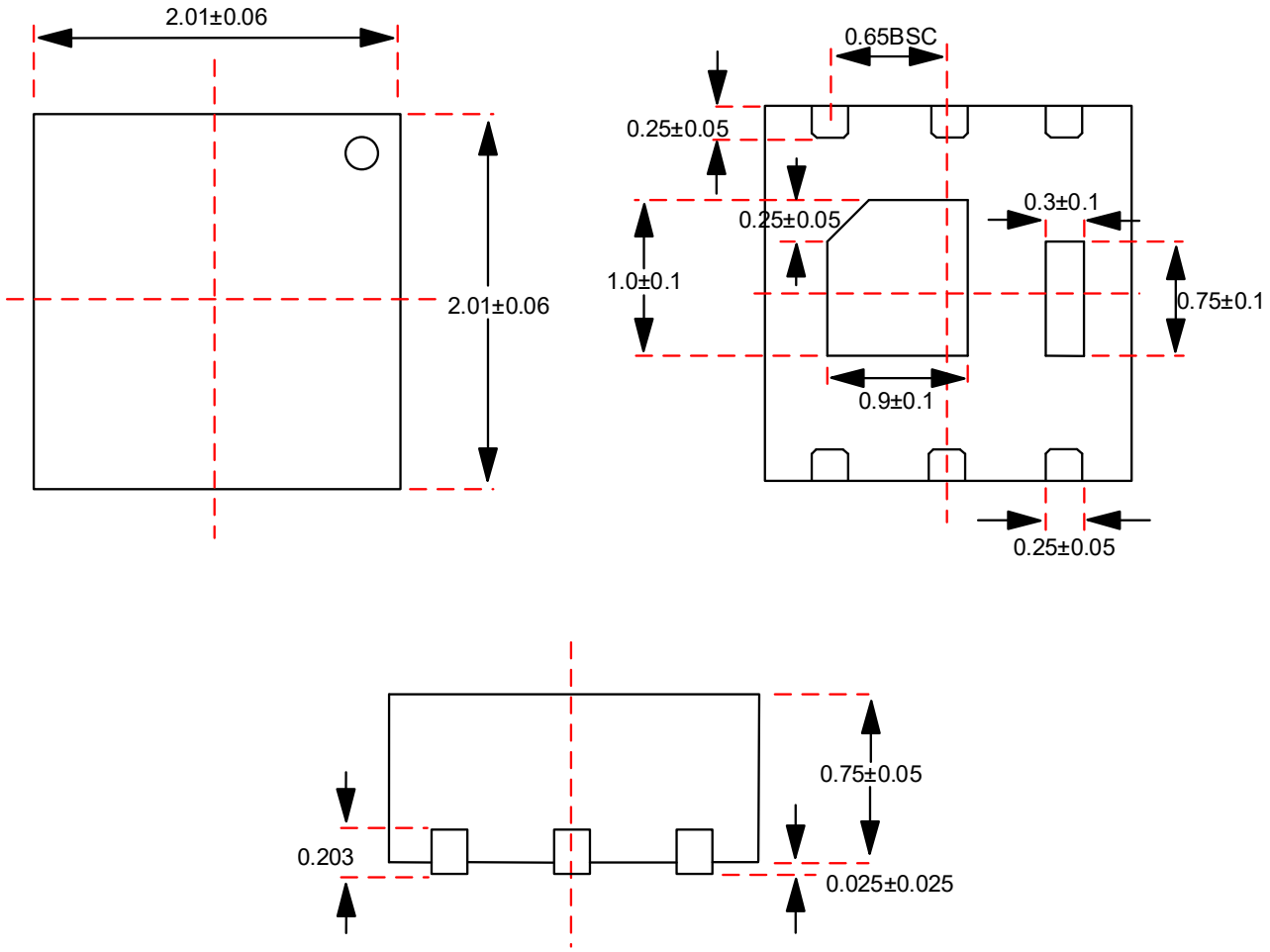
Unit：mm

SOT-223



Unit：mm

DFN2×2



Unit：mm

Published by
ARK Microelectronics Co., Ltd.
Add: D26, UESTC National Science Park, No. 1 Shuangxing Avenue, Chengdu, Sichuan
Tel: +86 (028) 8523-2215 Email: sales@ark-micro.com Website: www.ark-micro.com

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