

## Depletion-Mode Power MOSFET

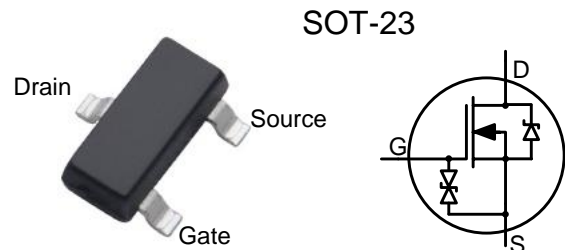
### General Features

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

<b>BV<sub>DSX</sub></b>	<b>R<sub>DS(ON)</sub> (Max.)</b>	<b>I<sub>DSS,min</sub></b>
<b>150V</b>	<b>25 Ω</b>	<b>100mA</b>

### Applications

- Synchronous Rectification
- Normally-on Switches
- Linear Amplifier
- High Voltage Regulator
- Constant Current Source
- Protection Circuits
- Telecom



### Ordering Information

Part Number	Package	Marking	Remark
DMZ1511E	SOT-23	1511	Halogen Free

### Absolute Maximum Ratings

T<sub>A</sub>=25°C unless otherwise specified

Symbol	Parameter	DMZ1511E	Unit
V <sub>DSX</sub>	Drain-to-Source Voltage <sup>[1]</sup>	150	V
V <sub>DGX</sub>	Drain-to-Gate Voltage <sup>[1]</sup>	150	V
I <sub>D</sub>	Continuous Drain Current	0.1	A
I <sub>DM</sub>	Pulsed Drain Current <sup>[2]</sup>	0.4	
P <sub>D</sub>	Power Dissipation	0.50	W
V <sub>GS</sub>	Gate-to-Source Voltage	±20	V
T <sub>L</sub>	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	°C
T <sub>J</sub> and T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to 150	

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

### Thermal Characteristics

Symbol	Parameter	DMZ1511E	Unit
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	250	K/W

## Electrical Characteristics

### OFF Characteristics

 $T_A = 25^\circ\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$BV_{DSX}$	Drain-to-Source Breakdown Voltage	150	--	--	V	$V_{GS} = -5V, I_D = 250\mu A$
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	10	$\mu A$	$V_{DS} = 150V, V_{GS} = -5V$
		--	--	1.0	mA	$V_{DS} = 150V, V_{GS} = -5V$ $T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Leakage Current	--	--	20	$\mu A$	$V_{GS} = +20V, V_{DS} = 0V$
		--	--	-20		$V_{GS} = -20V, V_{DS} = 0V$

### ON Characteristics

 $T_A = 25^\circ\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$I_{DSS}$	Saturated Drain-to-Source Current	100	--	--	mA	$V_{GS} = 0V, V_{DS} = 25V$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	--	25	$\Omega$	$V_{GS} = 0V, I_D = 50mA^{[3]}$
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-3.3	--	-1.5	V	$V_{DS} = 3V, I_D = 8\mu A$
gfs	Forward Transconductance	--	0.24	--	S	$V_{DS} = 10V, I_D = 50mA$

### Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$C_{ISS}$	Input Capacitance	--	12.8	--	pF	$V_{GS} = -10V$ $V_{DS} = 25V$ $f = 1.0MHz$
$C_{OSS}$	Output Capacitance	--	5.4	--		
$C_{RSS}$	Reverse Transfer Capacitance	--	3.3	--		
$Q_G$	Total Gate Charge	--	3	--	nC	$V_{GS} = -10V \sim 0V$ $V_{DS} = 75V, I_D = 100mA$
$Q_{GS}$	Gate-to-Source Charge	--	0.23	--		
$Q_{GD}$	Gate-to-Drain (Miller) Charge	--	1.1	--		

### Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	7	--	ns	$V_{GS} = -10V \sim 0V$ $V_{DD} = 75V, I_D = 100mA$ $R_G = 20\Omega$
$t_{rise}$	Rise Time	--	16	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	25	--		
$t_{fall}$	Fall Time	--	120	--		

**Source-Drain Diode Characteristics** $T_A=25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
$V_{SD}$	Diode Forward Voltage	--	--	1.2	V	$I_{SD}=100\text{mA}$ , $V_{GS}=-5\text{V}$

**NOTE:**

[1]  $T_J=+25^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$

[2] Repetitive rating, pulse width limited by maximum junction temperature.

[3] Pulse width  $\leq 380\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

### Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

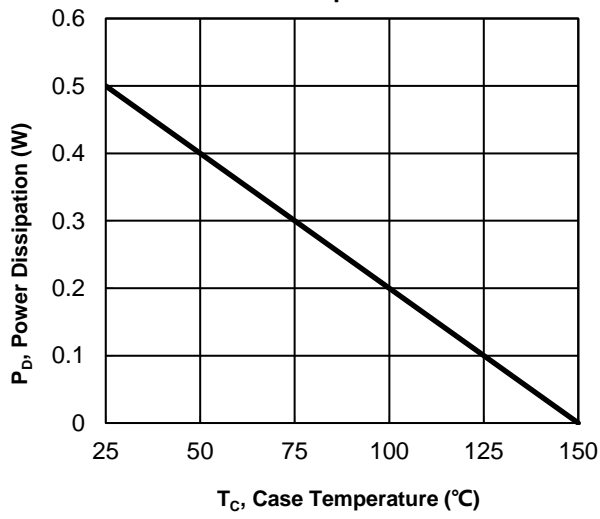
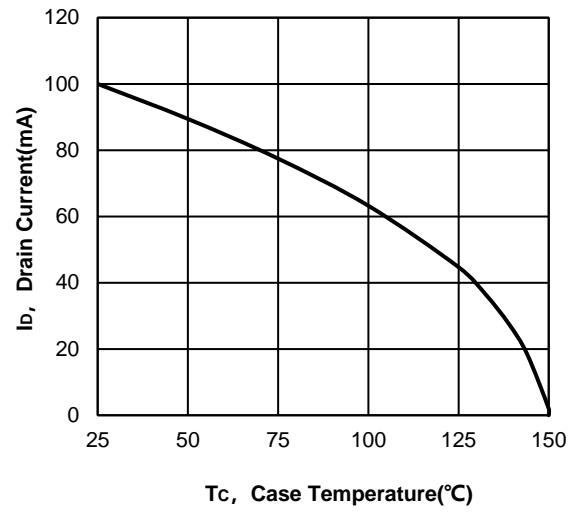
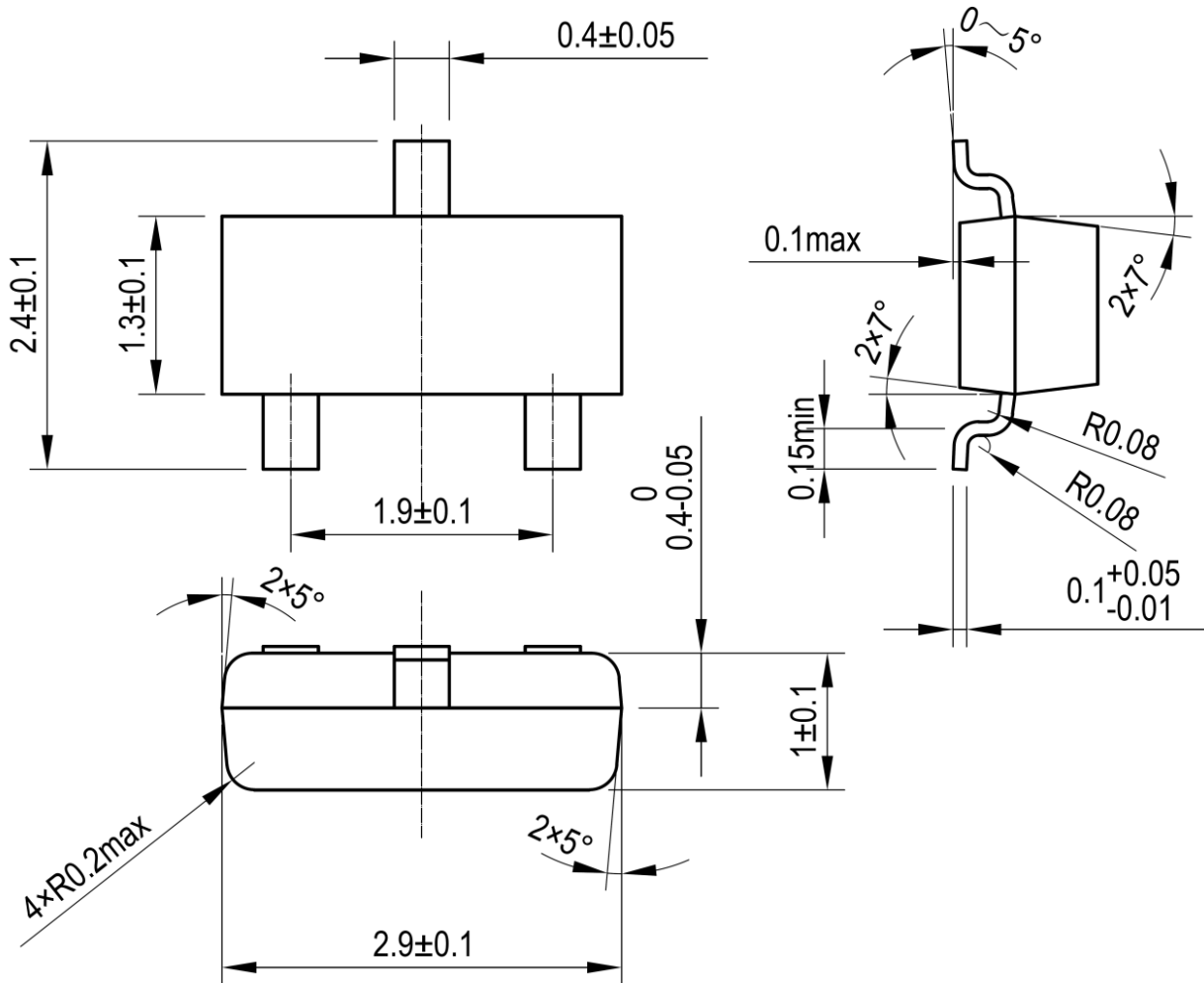


Figure 2. Maximum Continuous Drain Current vs Case Temperature



Package Dimensions

SOT-23





**Published by**

**ARK Microelectronics Co., Ltd.**

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