

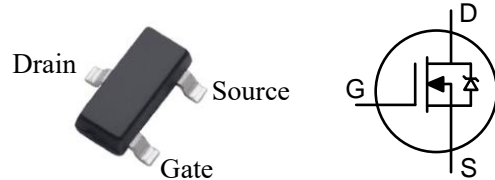
## 150V Depletion-Mode Power MOSFET

### General Features

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

$BV_{DSX}$	$R_{DS(ON)} (MAX.)$	$I_{DSS} (MIN.)$
<b>150V</b>	<b>25Ω</b>	<b>100mA</b>

SOT-23



### Applications

- New Energy Vehicles
- Industrial Automation
- Surge Protection
- Non-isolated Linear Power Supply
- Normally-on Switches
- Linear Amplifier
- Constant Current Source
- Telecom

### Ordering Information

Part Number	Package	Marking	Remark
DMZ12C15A	SOT-23	12C15	Halogen Free

### Absolute Maximum Ratings

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

Symbol	Parameter	DMZ12C15A	Unit
$V_{DSX}$	Drain-to-Source Voltage <sup>[1]</sup>	150	V
$V_{DGX}$	Drain-to-Gate Voltage <sup>[1]</sup>	150	V
$I_D$	Continuous Drain Current	0.1	A
$I_{DM}$	Pulsed Drain Current <sup>[2]</sup>	0.4	
$P_D$	Power Dissipation	0.50	W
$V_{GS}$	Gate-to-Source Voltage	±20	V
$T_L$	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	°C
$T_J$ and $T_{STG}$	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.*

*Note: The MOSFET is sensitive to electrostatic discharge. When handling this device, the worktables, operators, soldering irons and other objects should be protected against anti-static discharge.*

### Thermal Characteristics

Symbol	Parameter	DMZ12C15A	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	250	K/W

## Electrical Characteristics

### OFF Characteristics

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$BV_{DSX}$	Drain-to-Source Breakdown Voltage	150	--	--	V	$V_{GS} = -10\text{V}$ , $I_D = 250\mu\text{A}$
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	200	nA	$V_{DS} = 150\text{V}$ , $V_{GS} = -10\text{V}$
		--	--	100	$\mu\text{A}$	$V_{DS} = 150\text{V}$ , $V_{GS} = -10\text{V}$ $T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Leakage Current	--	--	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$

### ON Characteristics

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$I_{DSS}$	Saturated Drain-to-Source Current	100	--	--	mA	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	14	25	$\Omega$	$V_{GS} = 0\text{V}$ , $I_D = 50\text{mA}^{[3]}$
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-2.5	--	-5.0	V	$V_{DS} = 3\text{V}$ , $I_D = 8\mu\text{A}$
gfs	Forward Transconductance	--	85	--	mS	$V_{DS} = 10\text{V}$ , $I_D = 50\text{mA}$

### Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$C_{ISS}$	Input Capacitance	--	33.2	--	pF	$V_{GS} = -10\text{V}$ $V_{DS} = 25\text{V}$ $f = 1.0\text{MHz}$
$C_{OSS}$	Output Capacitance	--	12.8	--		
$C_{RSS}$	Reverse Transfer Capacitance	--	6.5	--		
$Q_G$	Total Gate Charge	--	1.1	--	nC	$V_{GS} = -10\text{V} \sim 5\text{V}$ $V_{DD} = 25\text{V}$ , $I_D = 80\text{mA}$
$Q_{GS}$	Gate-to-Source Charge	--	0.6	--		
$Q_{GD}$	Gate-to-Drain (Miller) Charge	--	0.2	--		

### Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	6.4	--	ns	$V_{GS} = -10\text{V} \sim 0\text{V}$ $V_{DD} = 25\text{V}$ , $I_D = 80\text{mA}$ $R_G = 10\Omega$
$t_{rise}$	Rise Time	--	4.8	--		
$t_{d(off)}$	Turn-off Delay Time	--	5.6	--		
$t_{fall}$	Fall Time	--	35.2	--		

### 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	$I_{SD} = 50\text{mA}$ , $V_{GS} = -10\text{V}$

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

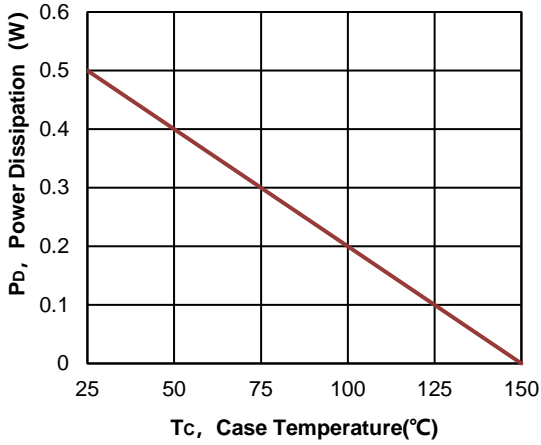


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

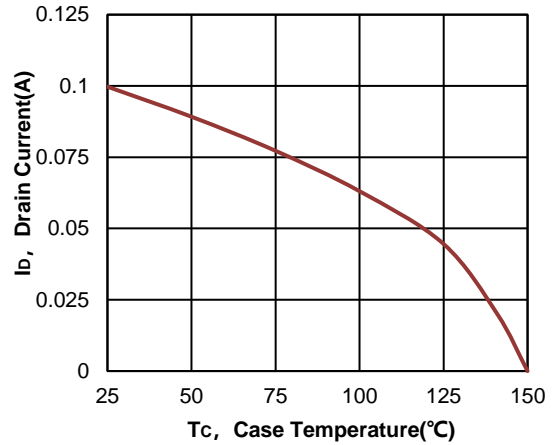


Figure 3. Typical Output Characteristics

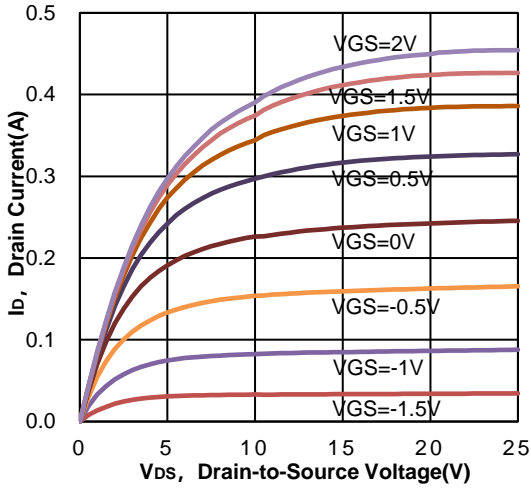


Figure 4. Typical Transfer Characteristics

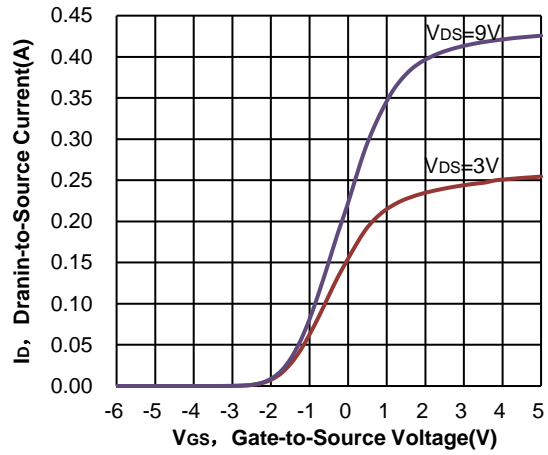


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

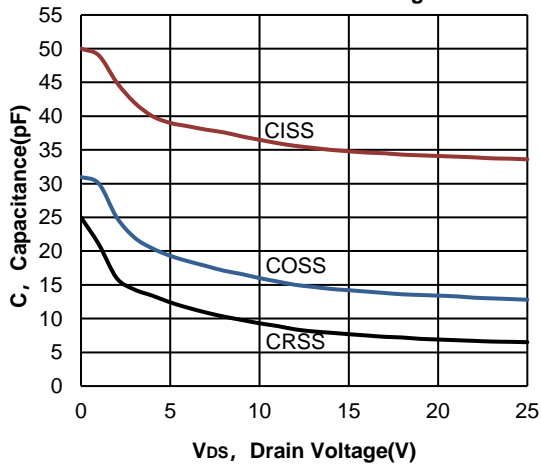
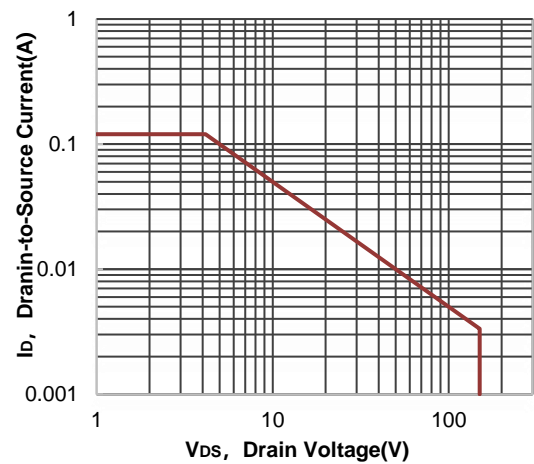
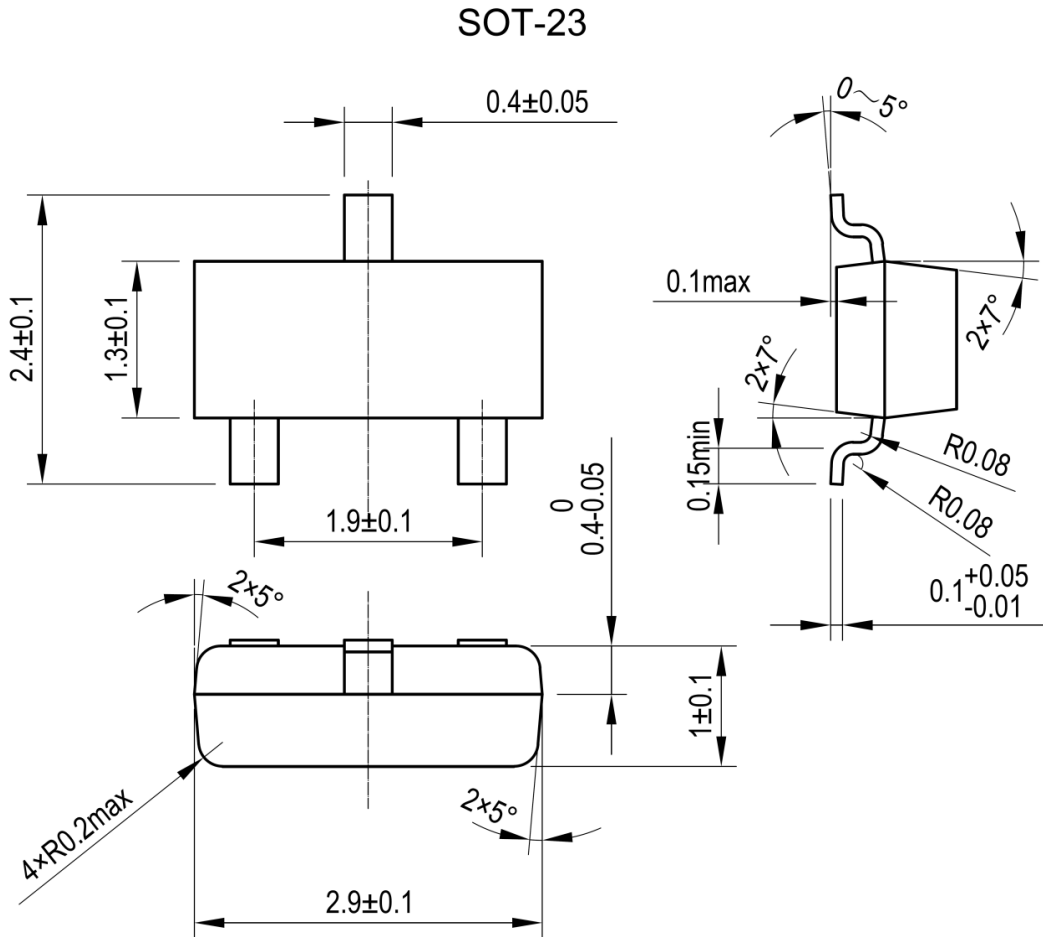


Figure 6. Maximum Forward Safe Operating Area



Package Dimensions





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