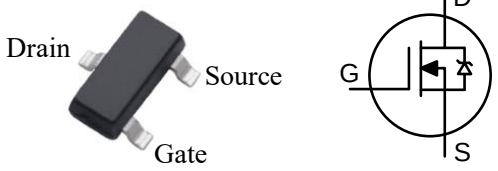
150V Depletion-Mode Power MOSFET

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.)
150V	25Ω	100mA

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℃ unless otherwise specified

Symbol	Parameter	DMZ12C15A	Unit
V_{DSX}	Drain-to-Source Voltage[1]	150	V
V_{DGX}	Drain-to-Gate Voltage[1]	150	V
I_D	Continuous Drain Current	0.1	A
I_{DM}	Pulsed Drain Current[2]	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	℃
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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	250	K/W

Electrical Characteristics

OFF Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	150	--	--	V	V_{GS}=-10V, I_D=250μA
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	200	nA	V_{DS}=150V, V_{GS}=-10V
		--	--	100	uA	V_{DS}=150V, V_{GS}=-10V T_J=125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	±100	nA	V_{GS}=±20V, V_{DS}=0V

ON Characteristics

T_A=25℃ 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	--	14	25	Ω	V_{GS}=0V, I_D=50mA[3]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-2.5	--	-5.0	V	V_{DS}=3V, I_D=8μA
gfs	Forward Transconductance	--	85	--	mS	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	--	33.2	--	pF	V_{GS}=-10V V_{DS}=25V f=1.0MHz
C_{oss}	Output Capacitance	--	12.8	--		
C_{rss}	Reverse Transfer Capacitance	--	6.5	--		
Qg	Total Gate Charge	--	1.1	--	nC	V_{GS}=-10V~5V V_{DD}=25V, I_D=80mA
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}=-10V~0V V_{DD}=25V, I_D=80mA R_G=10Ω
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℃ munless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_{SD}=50mA, V_{GS}=-10V

NOTE:

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] Pulse width≤380μs; duty cycle≤2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

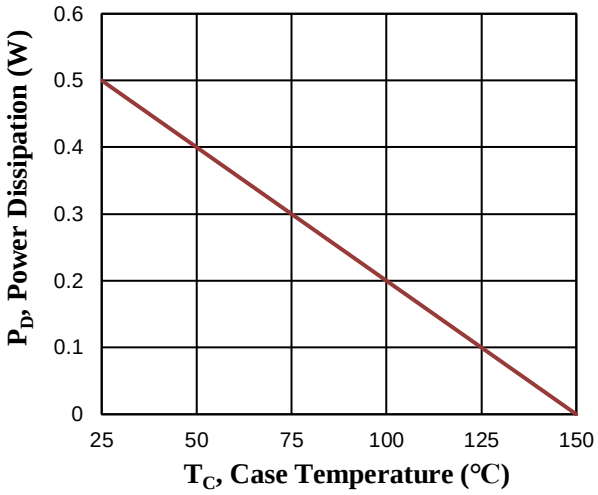


Figure 2. Maximum ContinuousDrain Current vs. Case Temperature

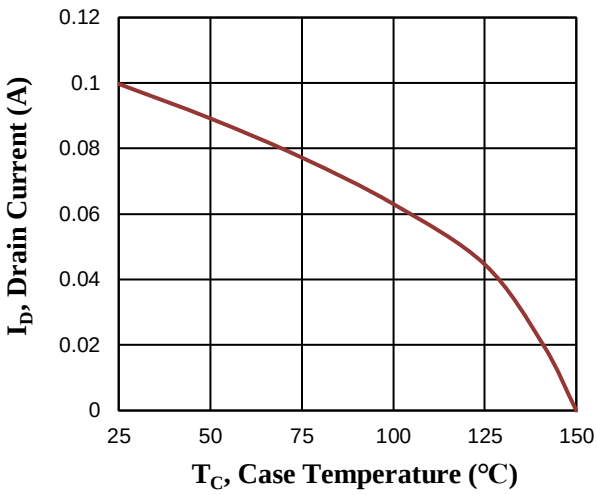


Figure 3. Typical Output Characteristics

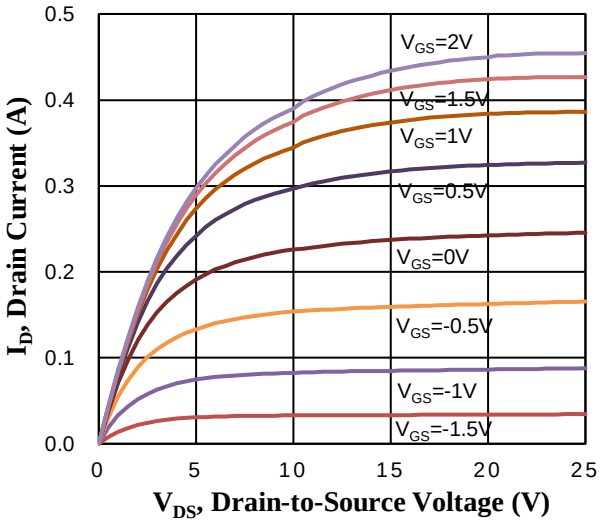


Figure 4. Typical Transfer Characteristics

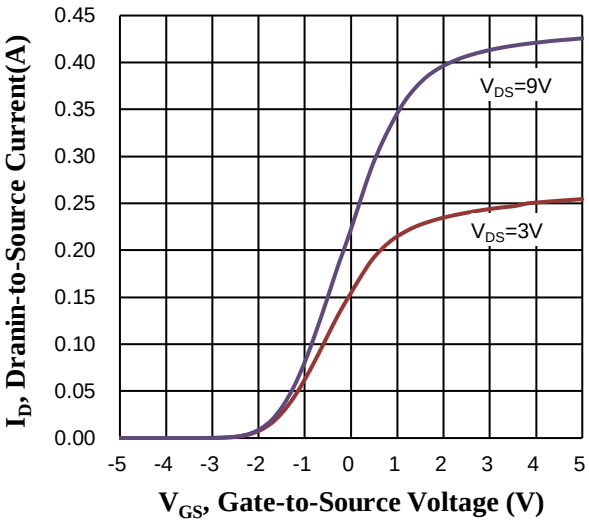


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

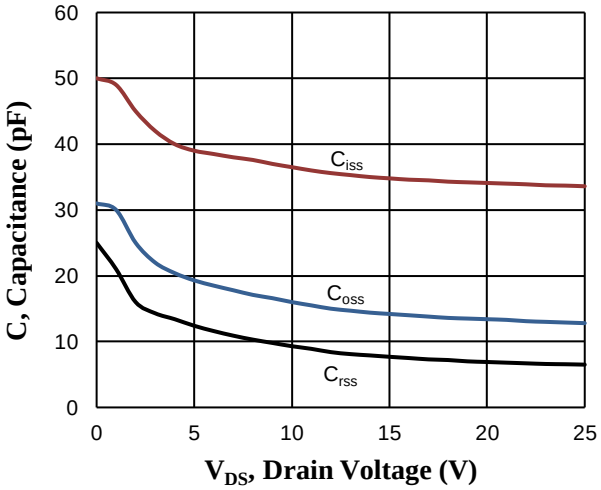
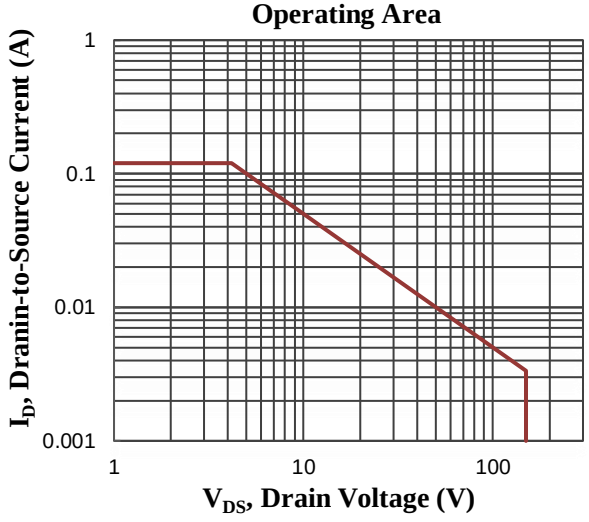
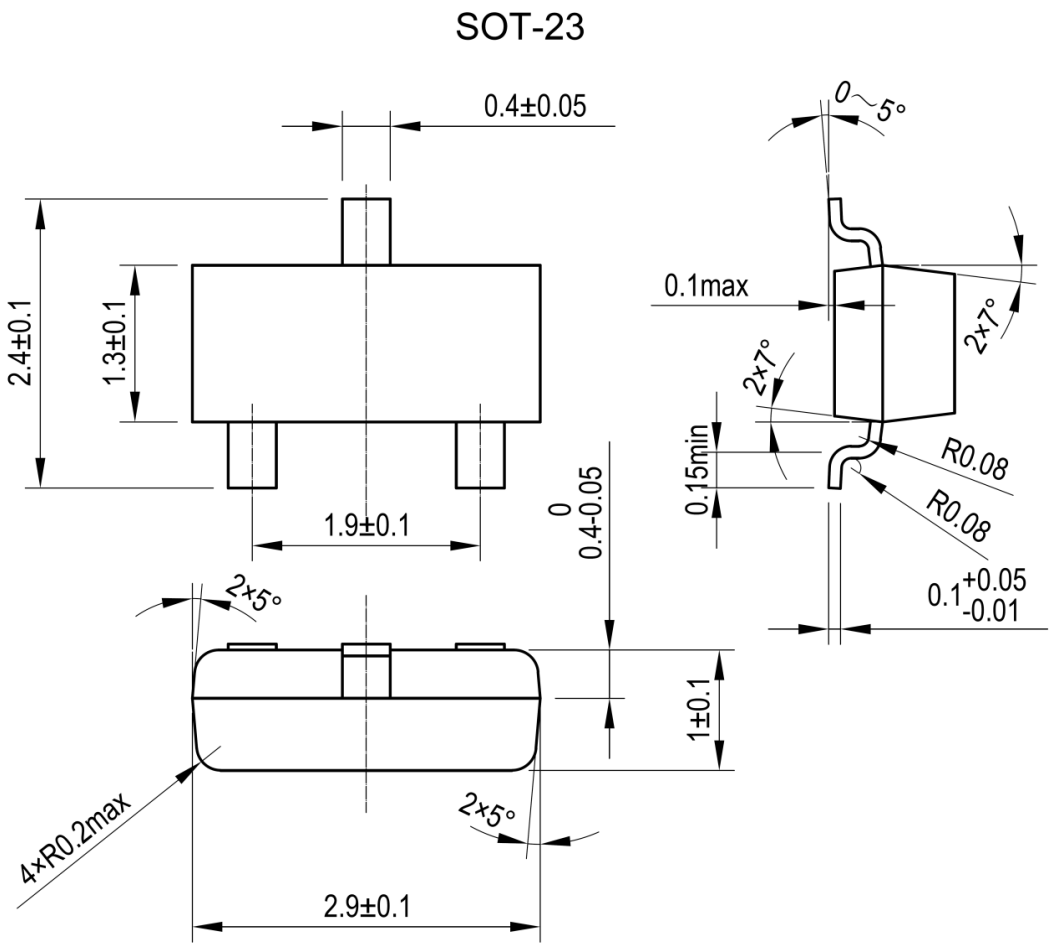


Figure 6. Maximum Forward Safe Operating Area



Package Dimensions



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