

Depletion-Mode Power MOSFET

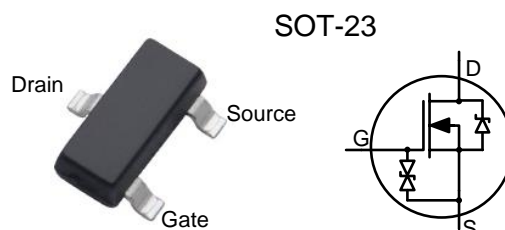
General Features

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

BV_{DSX}	R_{DS(ON)} (Max.)	I_{DSS,min}
600V	150 Ω	50mA

Applications

- Normally-on Switches
- SMPS Start-up Circuit
- Linear Amplifier
- Converters
- Constant Current Source
- Telecom



Ordering Information

Part Number	Package	Marking	Remark
DMZ6012E	SOT-23	612	Halogen Free

Absolute Maximum Ratings

TA=25°C unless otherwise specified

Symbol	Parameter	DMZ6012E	Unit
V _{DSX}	Drain-to-Source Voltage ^[1]	600	V
V _{DGX}	Drain-to-Gate Voltage ^[1]	600	V
I _D	Continuous Drain Current	0.04	A
I _{DM}	Pulsed Drain Current ^[2]	0.16	
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.

Thermal Characteristics

Symbol	Parameter	DMZ6012E	Unit
R _{θJA}	Thermal Resistance, Junction-to-Ambient	250	K/W

Electrical Characteristics

OFF Characteristics

TA=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV _{DSX}	Drain-to-Source Breakdown Voltage	600	--	--	V	V _{GS} =-5V, I _D =250μA
I _{D(OFF)}	Drain-to-Source Leakage Current	--	--	1	μA	V _{DS} =600V, V _{GS} =-5V
		--	--	100	μA	V _{DS} =600V, 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

TA=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
I _{DSS}	Saturated Drain-to-Source Current	50	--	--	mA	V _{GS} =0V, V _{DS} =25V
R _{DS(ON)}	Static Drain-to-Source On-Resistance	--	110	150	Ω	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 =8μA
gfs	Forward Transconductance	--	77	--	mS	V _{DS} =10V, I _D =5mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C _{ISS}	Input Capacitance	--	62	--	pF	V _{GS} =-5V V _{DS} =25V f=1.0MHz
C _{OSS}	Output Capacitance	--	13	--		
C _{RSS}	Reverse Transfer Capacitance	--	9	--		
Q _G	Total Gate Charge	--	8	--	nC	V _{GS} =-5V~5V V _{DS} =300V, I _D =7mA
Q _{GS}	Gate-to-Source Charge	--	0.6	--		
Q _{GD}	Gate-to-Drain (Miller) Charge	--	3	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
t _{d(ON)}	Turn-on Delay Time	--	10	--	ns	V _{GS} = -5V~5V V _{DD} = 300V, I _D =7mA R _G = 20 Ω
t _{rise}	Rise Time	--	22	--		
t _{d(OFF)}	Turn-off Delay Time	--	35	--		
t _{fall}	Fall Time	--	210	--		

Source-Drain Diode Characteristics

TA=25°C unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
V _{SD}	Diode Forward Voltage	--	--	1.2	V	I _{SD} = 100 mA, V _{GS} = -10 V

NOTE:[1] T_J=+25°C to +150°C

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

[3] Pulse width ≤ 380 μs; duty cycle ≤ 2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

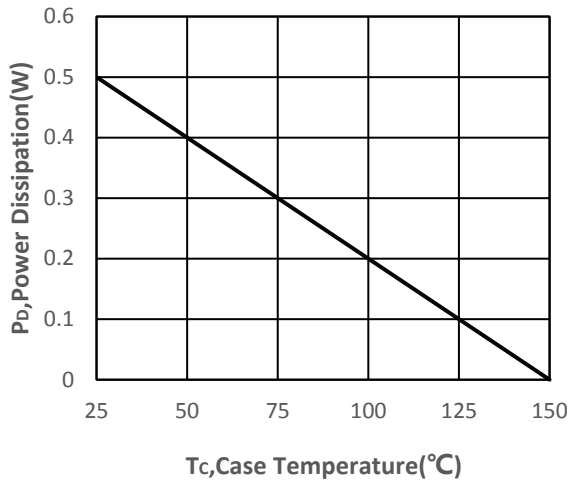


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

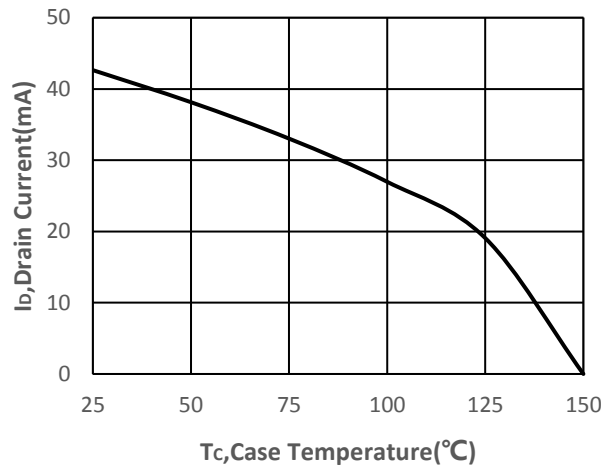


Figure 3. Typical Output Characteristics

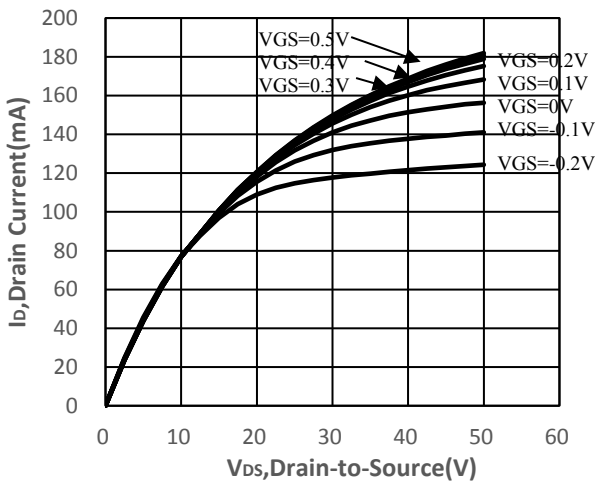


Figure 4. Typical Transfer Characteristics

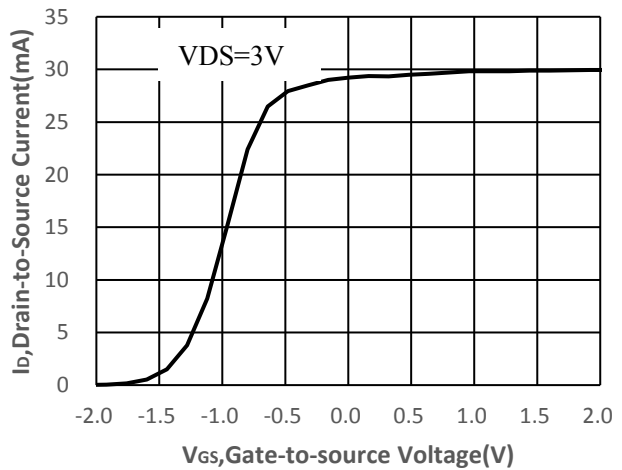


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

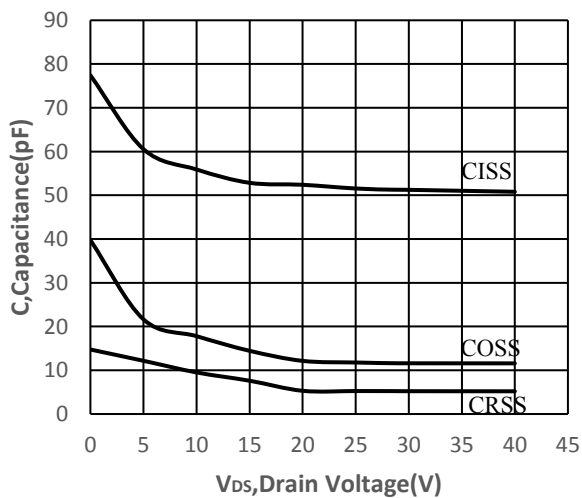
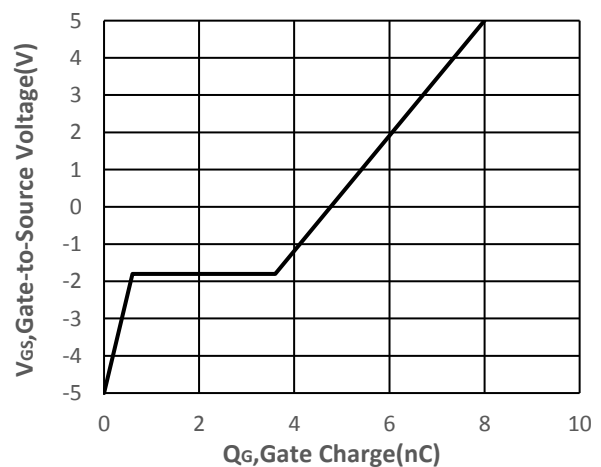
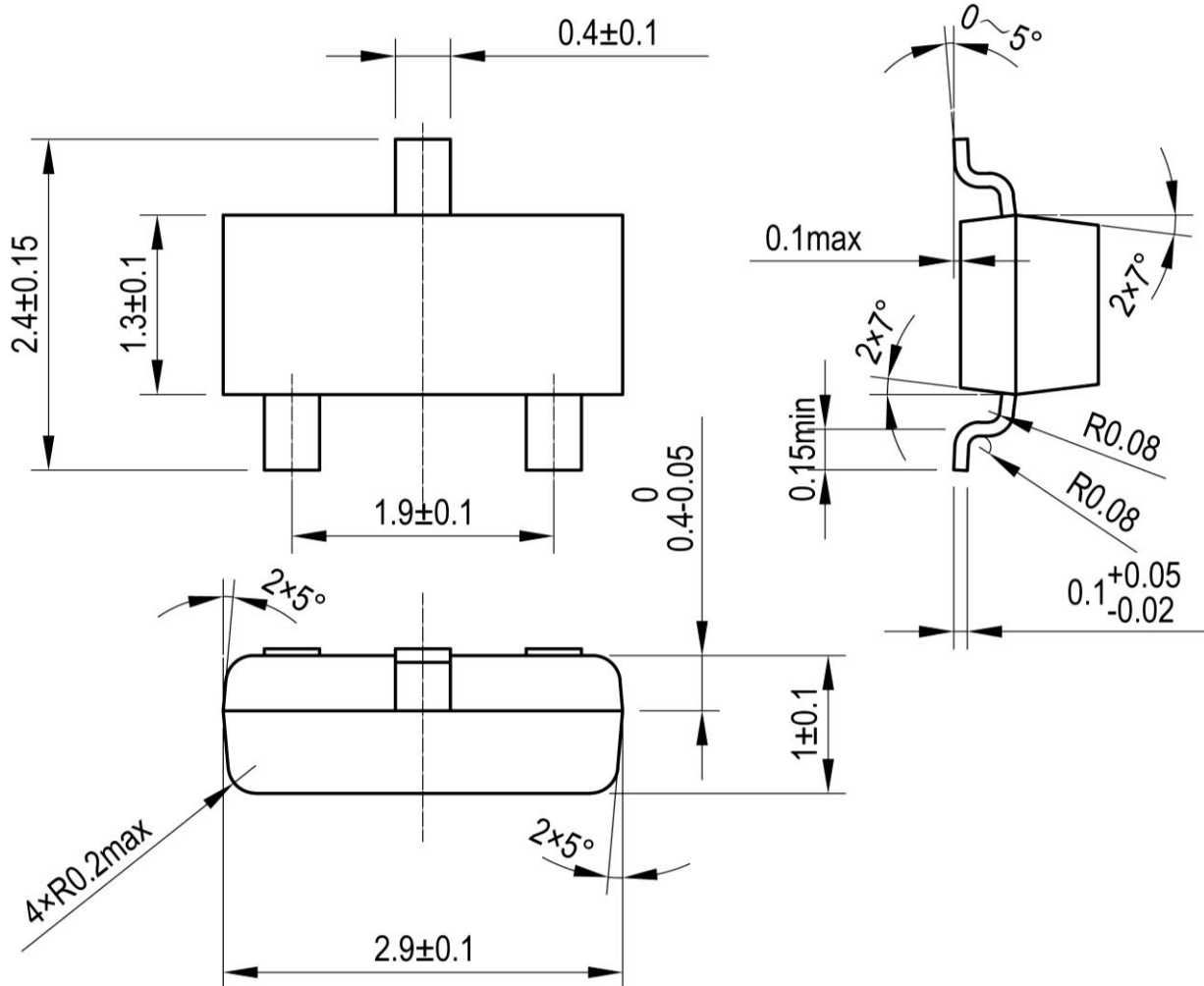


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage



Package Dimensions
SOT-23




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