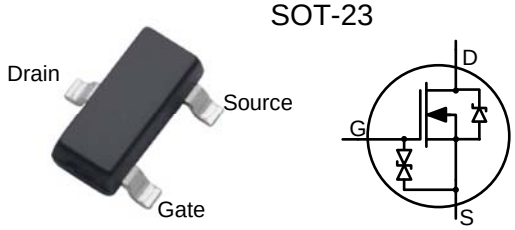
Depletion-Mode Power MOSFET

General Features

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

BV_{DSX}	$R_{DS(ON)}$ (Max.)	$I_{DSS,min}$
600V	700 Ω	5mA

SOT-23



Applications

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

Ordering Information

Part Number	Package	Marking	Remark
DMZ6005E	SOT-23	605E	Halogen Free

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	DMZ6005E	Unit
V_{DSX}	Drain-to-Source Voltage[1]	600	V
V_{DGX}	Drain-to-Gate Voltage[1]	600	V
I_D	Continuous Drain Current	0.02	A
I_{DM}	Pulsed Drain Current[2]	0.08	
P_D	Power Dissipation	0.50	W
V_{GS}	Gate-to-Source Voltage	±20	V
$V_{ESD(G-S)}$	Gate Source ESD HBM, C=100pF, R=1.5k Ω	700	V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J and T_{STG}	Operating and StorageTemperatureRange	-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	DMZ6005E	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	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	600	--	--	V	V_{GS}=-5V, I_D=250μA
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	0.1	μA	V_{DS}=600V，V_{GS}= -5V
		--	--	10	μA	V_{DS}=600V，V_{GS}= -5V T_J=125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	20	uA	V_{GS}=+20V, V_{DS}=0V
		--	--	-20		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	5	--	25	mA	V_{GS}=0V, V_{DS}=25V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	500	700	Ω	V_{GS}=0V，I_D=3mA [3]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-3.0	--	-1.8	V	V_{DS} =3V, I_D=8μA
gfs	Forward Transconductance	--	15.4	--	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	--	12.3	--	pF	V_{GS}=-5V V_{DS}=25V f=1.0MH_Z
C_{OSS}	Oput Capacitance	--	2.6	--		
C_{RSS}	Reverse Transfer Capacitance	--	1.8	--		
Q_G	Total Gate Charge	--	1.55	--	nC	V_{GS}=-5V~5V V_{DS}=300V, I_D=7mA
Q_{GS}	Gate-to-Source Charge	--	0.12	--		
Q_{GD}	Gate-to-Drain (Miller) Charge	--	0.56	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	4	--	ns	V_{GS} = -5V~5V V_{DD} = 300V, I_D=7mA R_G = 20Ohm
t_{rise}	Rise Time	--	9	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	14	--		
t_{fall}	Fall Time	--	84	--		

Source-Drain Diode Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_{SD} =3.0 mA, V_{GS} = -10 V

NOTE：

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

Figure 1. Maximum Power Dissipation vs. Case Temperature

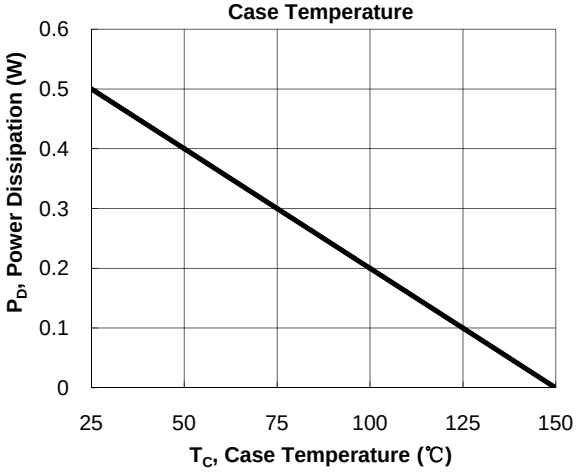


Figure 2. Maximum Continuous Drain Current vs Case Temperature

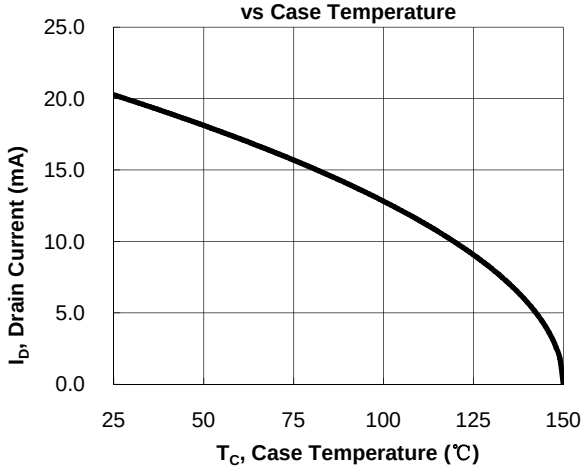


Figure 3. Typical Output Characteristics

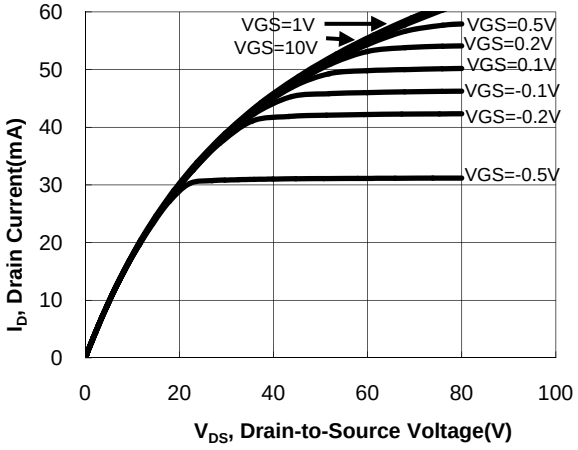


Figure 4. Typical Transfer Characteristics

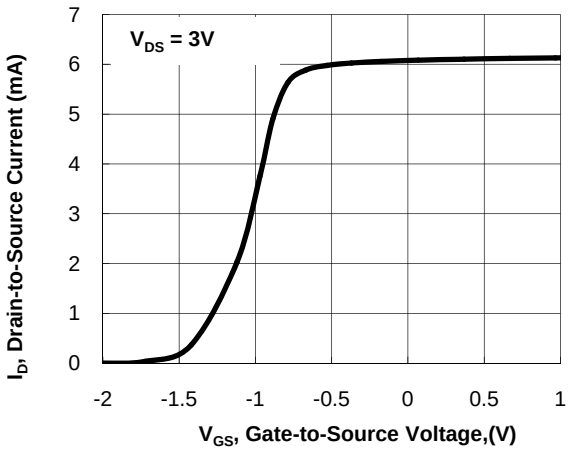


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

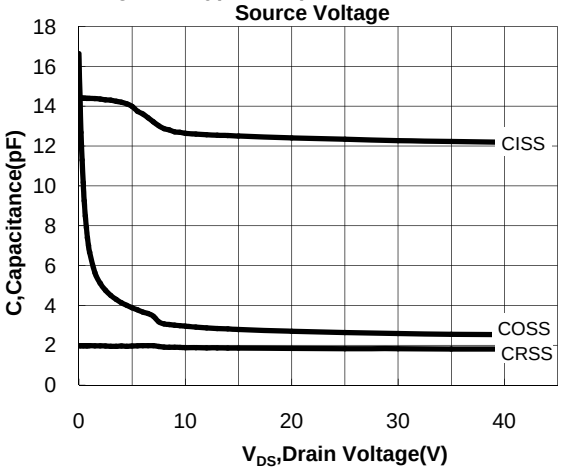
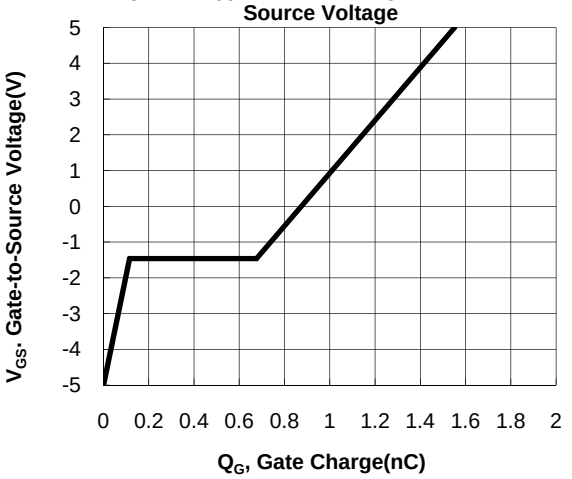
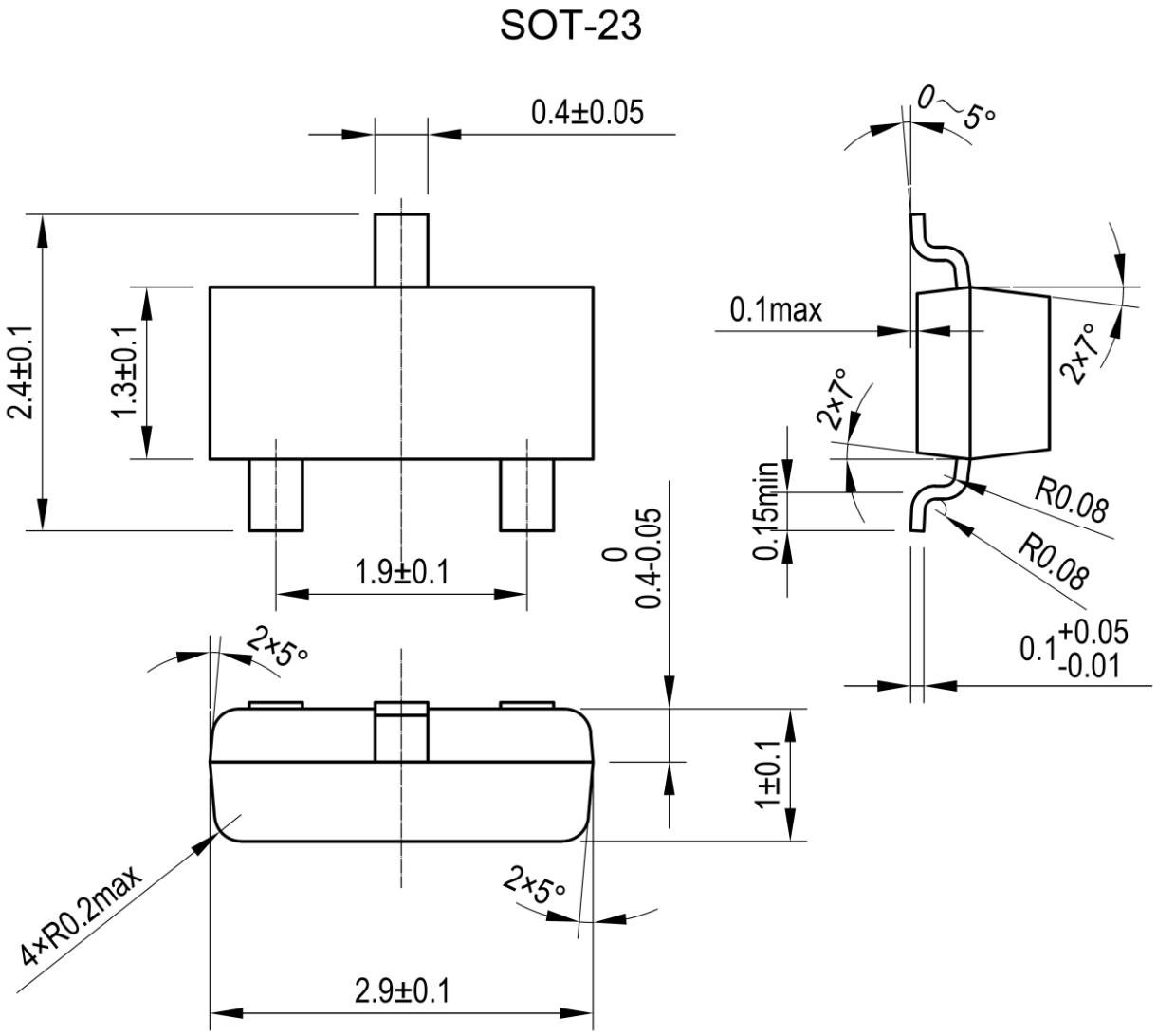


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage



Package Dimensions



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