

DMZ6005



Depletion-Mode Power MOSFET

General Features

- Depletion Mode (Normally On)
- Proprietary Advanced Planar Technology
- Rugged Polysilicon Gate Cell Structure
- Fast Switching Speed
- RoHS Compliant/Lead Free
- ESD Sensitive

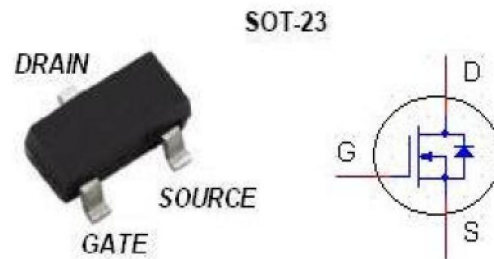
BV_{DSX}	$R_{DS(ON)}$ (Max.)	$I_{DSS,min}$
600V	700 Ω	12mA

Applications

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

Ordering Information

Part Number	Package	Marking
DMZ6005	SOT-23	605



Absolute Maximum Ratings

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

Symbol	Parameter	DMZ6005	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	600	V
V_{DGX}	Drain-to-Gate Voltage ^[1]	600	V
I_D	Continuous Drain Current	0.020	A
I_{DM}	Pulsed Drain Current	0.081	
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	$^{\circ}\text{C}$
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	DMZ6005	Unit
$R_{\theta JA}$	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	600	--	--	V	$V_{GS} = -5V, I_D = 250\mu A$
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	0.1	μA	$V_{DS} = 600V, V_{GS} = -5V$
		--	--	10	μA	$V_{DS} = 600V, V_{GS} = -5V$ $T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Leakage Current	--	--	100	nA	$V_{GS} = +20V, V_{DS} = 0V$
		--	--	-100		$V_{GS} = -20V, V_{DS} = 0V$

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	12	--	--	mA	$V_{GS} = 0V, V_{DS} = 25V$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	500	700	Ω	$V_{GS} = 0V, I_D = 3mA$ [4]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-2.7	--	-1.5	V	$V_{DS} = 3V, I_D = 8\mu A$
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	$V_{GS} = -5V$ $V_{DS} = 25V$ $f = 1.0MHz$
C_{OSS}	Output Capacitance	--	2.6	--		
C_{RSS}	Reverse Transfer Capacitance	--	1.8	--		
Q_G	Total Gate Charge	--	1.55	--	nC	$V_{GS} = -5V \sim 5V$ $V_{DS} = 300V, I_D = 5mA$
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	$V_{GS} = -5V \sim 5V$ $V_{DD} = 300V, I_D = 5mA$ $R_G = 20\Omega$
t_{rise}	Rise Time	--	9	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	14	--		
t_{fall}	Fall Time	--	84	--		

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

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

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 $\leq 2\%$.

Figure 1. Maximum Power Dissipation vs. Case Temperature

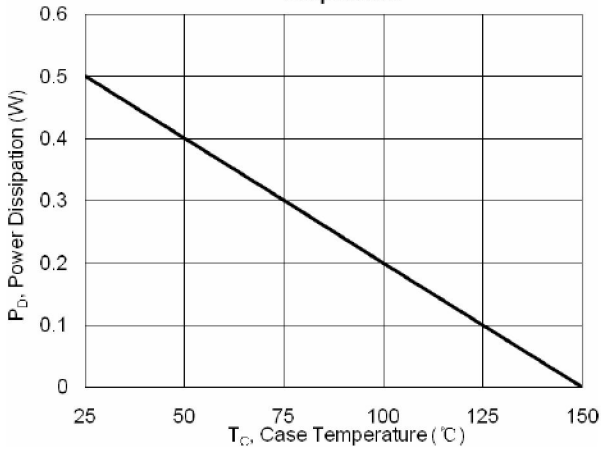


Figure 2. Maximum Continuous Drain Current vs Case Temperature

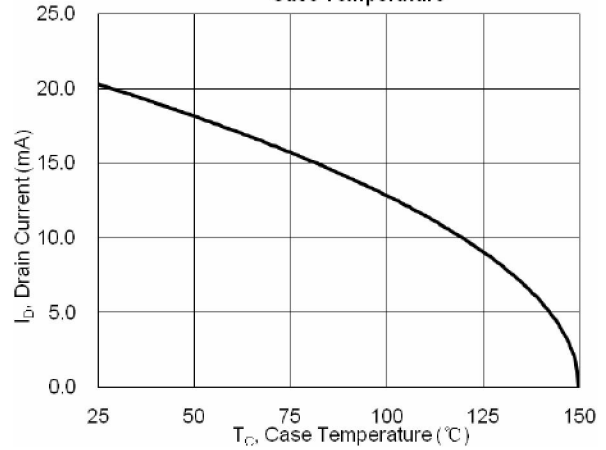


Figure 3. Typical Output Characteristics

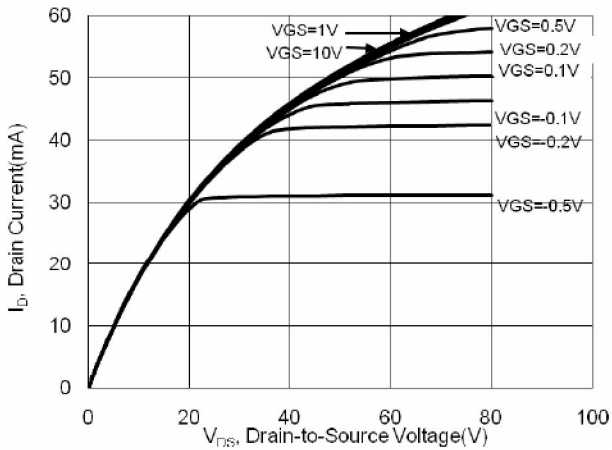


Figure 4. Typical Transfer Characteristics

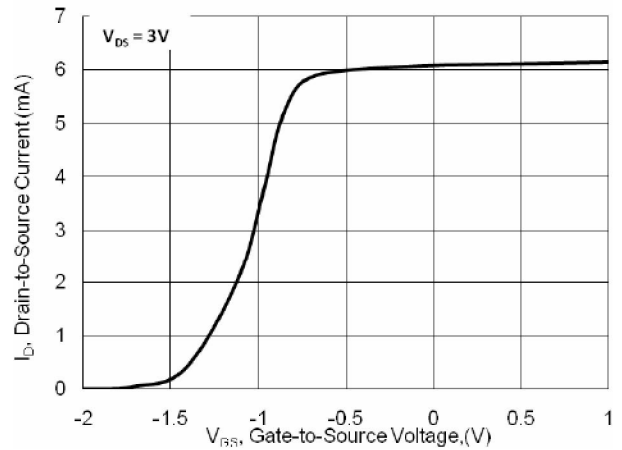


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

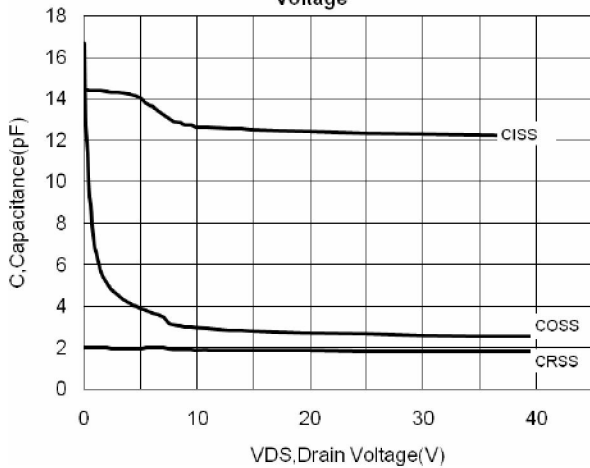


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

