Depletion-Mode Power MOSFET

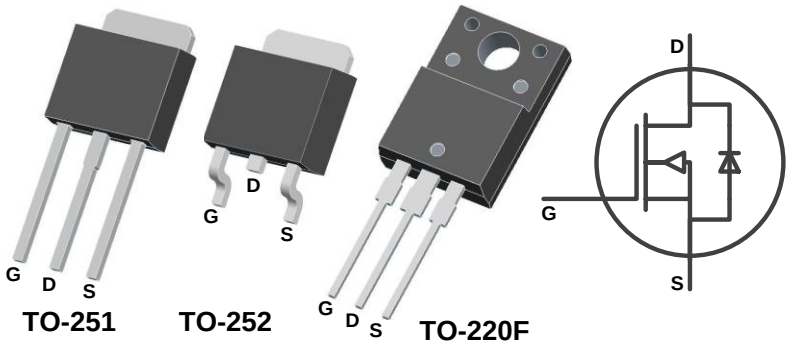
General Features

- 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.)	$I_{DSS,min}$
450V	2.2 Ω	2A

Applications

- Suppressing surge current
- Normally-on Switches
- Converters
- Synchronous Rectification
- Linear Amplifier
- Constant Current Source



Ordering Information

Part Number	Package	Marking	Remark
DMU4523D	TO-251	4523D	Halogen Free
DMD4523D	TO-252	4523D	Halogen Free
DMA4523D	TO-220F	DMA4523D	RoHS

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	DMU4523D/DMD4523D	DMA4523D	Unit
V_{DSX}	Drain-to-Source Voltage[1]	450		V
V_{DGX}	Drain-to-Gate Voltage[1]	450		V
I_D	Continuous Drain Current	2.5		A
I_{DM}	Pulsed Drain Current[2]	10		
P_D	Power Dissipation	89	22	W
	Derating Factor above 25℃	0.71	0.18	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.

Thermal Characteristics

Symbol	Parameter	DMU4523D/DMD4523D	DMA4523D	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.4	5.5	K/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	60	

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	450	--	--	V	V_{GS}=-5V, I_D=250μA
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	0.1	μA	V_{DS}=450V， V_{GS}= -5V
		--	--	1	mA	V_{DS}=450V， V_{GS}= -5V T_J=125℃
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℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
I_{DSS}	Saturated Drain-to-Source Current	2	--	--	A	V_{GS}=0V, V_{DS}=25V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	--	2.2	Ω	V_{GS}=0V， I_D=2A [3]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-2.4	--	-1.2	V	V_{DS} =3V, I_D=8μA
gfs	Forward Transconductance	--	7.7	--	S	V_{DS} =10V, I_D=2A

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{ISS}	Input Capacitance	--	423	--	pF	V_{GS}=-5V V_{DS}=25V f=1.0MHz
C_{OSS}	Oput Capacitance	--	47	--		
C_{RSS}	Reverse Transfer Capacitance	--	13	--		
Q_G	Total Gate Charge	--	14.7	--	nC	V_{GS}=-5V~5V V_{DS}=225V, I_D=2A
Q_{GS}	Gate-to-Source Charge	--	2.1	--		
Q_{GD}	Gate-to-Drain (Miller) Charge	--	7.0	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	30	--	ns	V_{GS} = -5V~5V V_{DD} =225V, I_D=2A R_G = 20Ohm
t_{rise}	Rise Time	--	150	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	180	--		
t_{fall}	Fall Time	--	170	--		

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} =1.0 A, 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

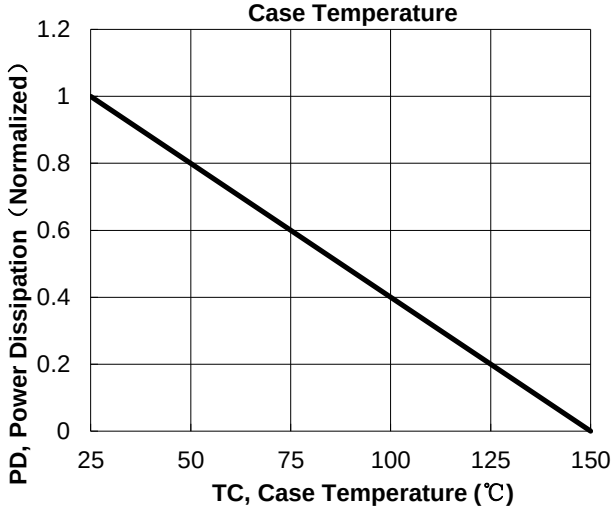


Figure 2. Maximum Continuous Drain Current vs Case Temperature

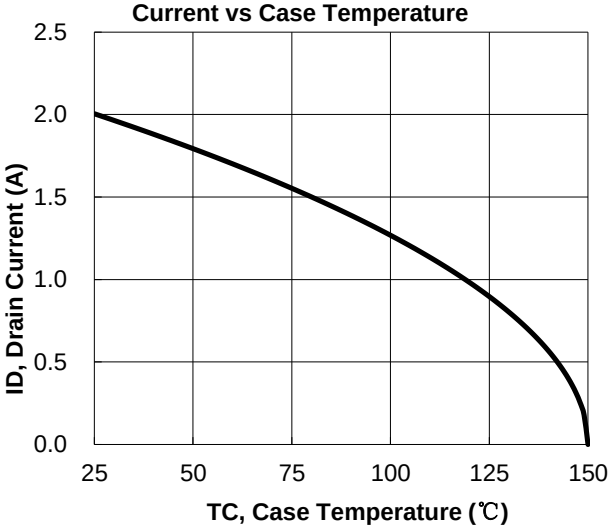


Figure 3. Typical Output Characteristics

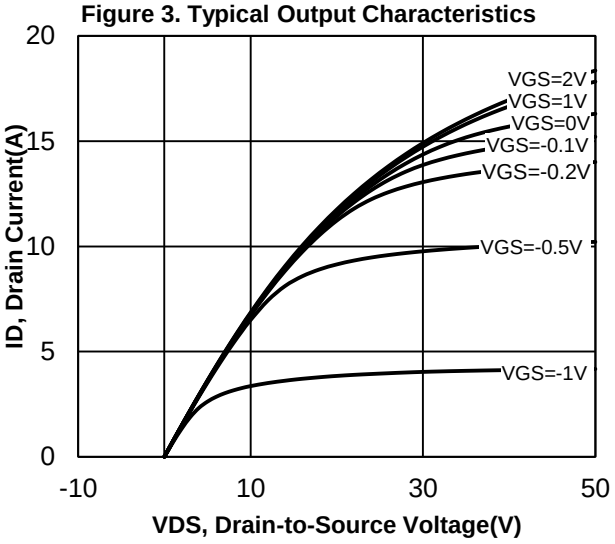


Figure 4. Typical Transfer Characteristics

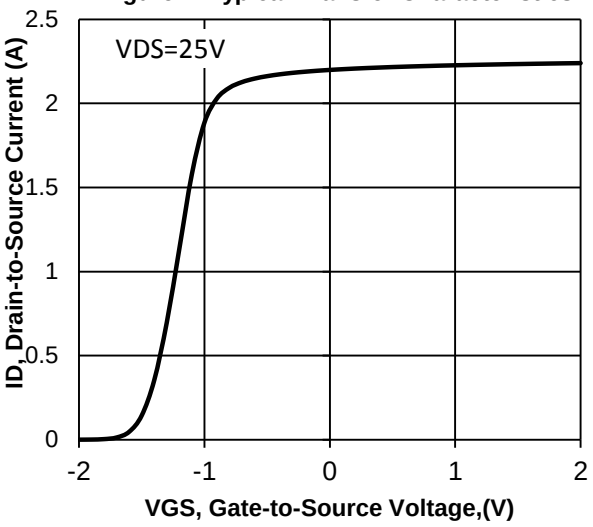


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

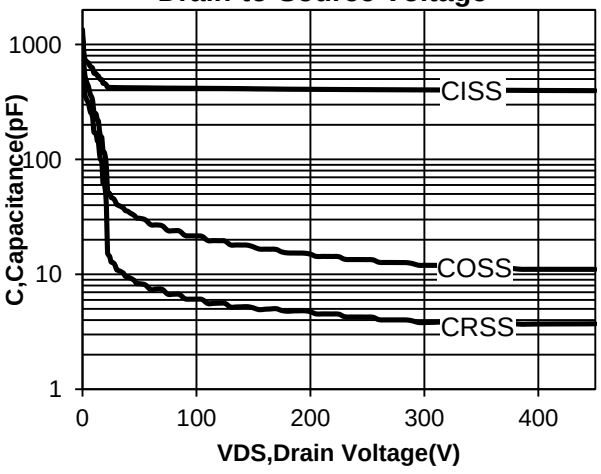
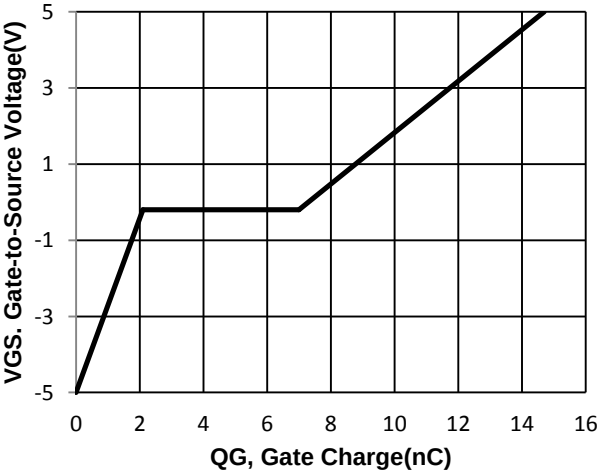
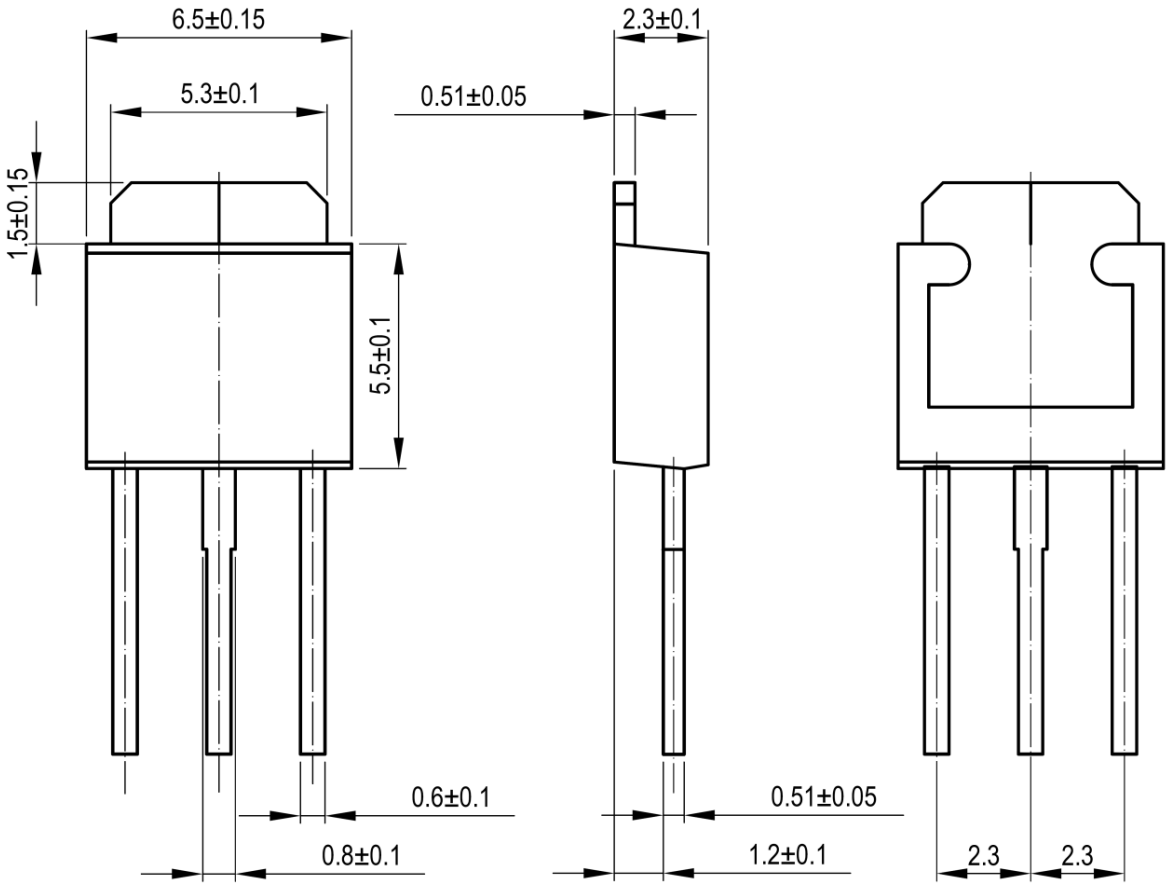


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

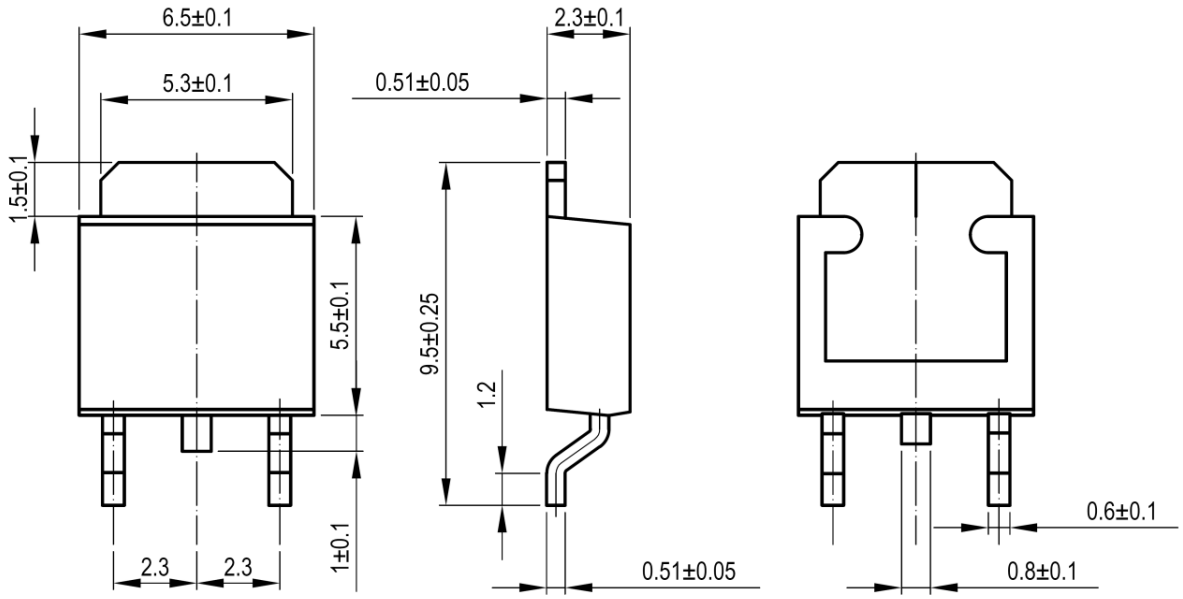


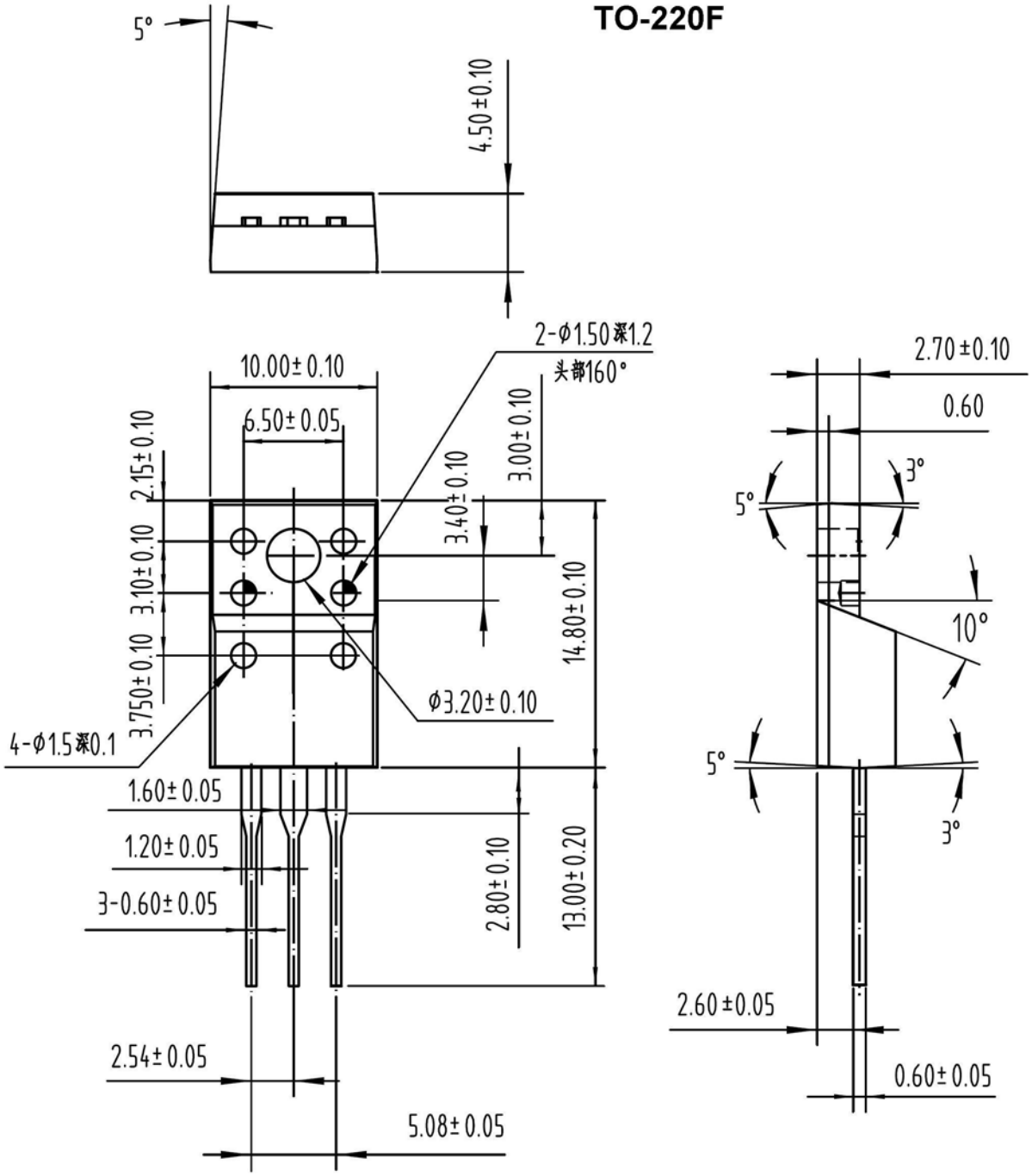
Package Dimensions

TO-251



TO-252


6.5±0.1
5.3±0.1
1.5±0.1
5.5±0.1
1±0.1
2.3
2.3
2.3±0.1
0.51±0.05
9.5±0.25
1.2
0.51±0.05
0.6±0.1
0.8±0.1



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