CHENMKO ENTERPRISE CO.,LTD

2N7002M1PT

SURFACE MOUNT
N-Channel Enhancement Mode Field Effect Transistor

VOLTAGE 60 Volts CURRENT 0.115 Ampere

Lead free devices

APPLICATION

* Servo motor control.
* Power MOSFET gate drivers.
* Other switching applications.

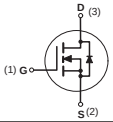
FEATURE

* Small surface mounting type. (FBPT-723)
* High density cell design for low $R_{DS(ON)}$.
* Suitable for high packing density.
* Rugged and reliable.
* High saturation current capability.
* Voltage controlled small signal switch.

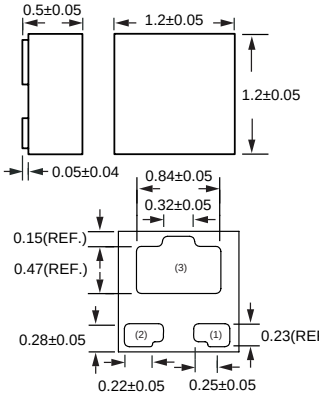
CONSTRUCTION

* N-Channel Enhancement

CIRCUIT



FBPT-723



Dimensions in millimeters

FBPT-723

Absolute Maximum Ratings

T_A = 25°C unless otherwise noted

Symbol	Parameter	2N7002M1PT	Units
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Maximum Drain Current - Continuous	115	mA
P_D	Maximum Power Dissipation	150	mW
T_J,T_{STG}	Operating Temperature Range	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C

Thermal characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	625	°C/W

2006-12

RATING CHARACTERISTIC CURVES (2N7002M1PT)

Electrical Characteristics T_A = 25°C unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 10 µA	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60 V, V_{GS} = 0 V			1	µA
		T_C=125°C			0.5	mA
I_{GSSF}	Gate - Body Leakage, Forward	V_{GS} = 15 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate - Body Leakage, Reverse	V_{GS} = -15 V, V_{DS} = 0 V			-100	nA
ON CHARACTERISTICS (Note 1)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 µA	1		2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 500 mA		1.2	7.5	Ω
		V_{GS} = 5.0 V, I_D = 50 mA		1.7	7.5	
$V_{DS(ON)}$	Drain-Source On-Voltage	V_{GS} = 10 V, I_D = 500mA			3.75	V
		V_{GS} = 5.0 V, I_D = 50 mA			0.375	
$I_{D(ON)}$	On-State Drain Current	V_{GS} = 10 V, V_{DS} = 7.0$V_{DS(on)}$	500			mA
g_{FS}	Forward Transconductance	V_{DS} = 10 $V_{DS(on)}$, I_D = 200 mA	80			mS
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz			50	pF
C_{oss}	Output Capacitance				25	
C_{rss}	Reverse Transfer Capacitance				5	
t_{on}	Turn-On Time	V_{DD} = 25 V, R_G = 25 Ω, I_D = 500 mA V_{GS} = 10 V, R_L = 50 Ω			20	nS
t_{off}	Turn-Off Time				40	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 200 mA (Note 1)		0.85	1.2	V

Note:
1. Pulse Test: Pulse Width < 300µs, Duty Cycle < 2.0%.

RATING CHARACTERISTIC CURVES (2N7002M1PT)

Typical Electrical Characteristics

Figure 1. Output Characteristics

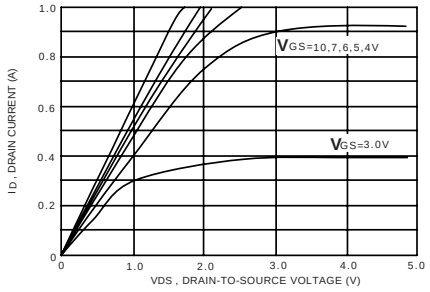


Figure 2. Capacitance Characteristics

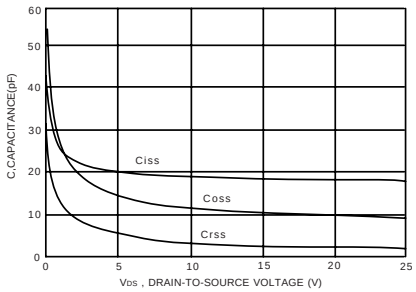


Figure 5. Gate Threshold Variation with Temperature

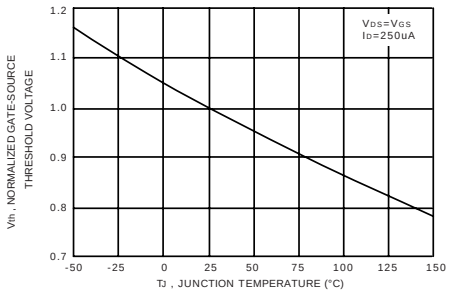


Figure 4. On-Resistance Variation with Temperature