CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT
N-Channel Enhancement Mode Field Effect Transistor
VOLTAGE 60 Volts   CURRENT 115 mAmpere
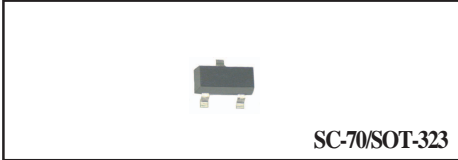
2N7002EPT

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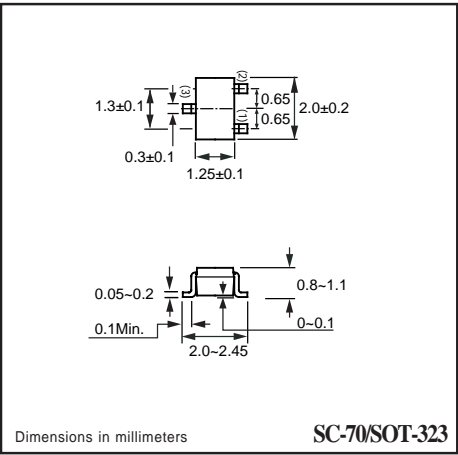
* Servo motor control.
* Power MOSFET gate drivers.
* Other switching applications.

FEATURE
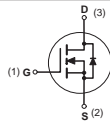
* Small surface mounting type. (SC-70/SOT-323)
* High density cell design for low R$_{DS(ON)}$.
* Suitable for high packing density.
* Rugged and reliable.
* High saturation current capability.
* Voltage controlled small signal switch.

CIRCUIT

SC-70/SOT-323

Dimensions in millimeters   SC-70/SOT-323

Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter		2N7002EPT	Units
V$_{DSS}$	Drain-Source Voltage		60	V
V$_{GSS}$	Gate-Source Voltage		±20	V
I$_D$	Maximum Drain Current - Continuous	T$_A$= 25°C	115	mA
P$_D$	Maximum Power Dissipation	T$_A$= 25°C	200	mW
T$_J$	Operating Temperature Range		-55 to 150	°C
T$_{STG}$	Storage Temperature Range		-55 to 150	°C

Thermal characteristics

R$_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	625	°C/W

2009-09

ELECTRICAL CHARACTERISTIC (2N7002EPT)

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_J=125°C			0.5	mA
I_{GSSF}	Gate - Body Leakage, Forward	V_{GS} = 15 V, V_{DS} = 0 V				10	nA
I_{GSSR}	Gate - Body Leakage, Reverse	V_{GS} = -15 V, V_{DS} = 0 V				-10	nA
ON CHARACTERISTICS (Note 1)							
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 µA		1.0	1.5	2.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 5 V, I_D = 50 mA	T_C=25°C		3.2	7.5	Ω
		V_{GS} = 10 V, I_D = 500 mA	T_C=125°C		4.4	13.5	
$I_{D(ON)}$	On-State Drain Current	V_{GS} = 10V, V_{DS} = 7.5 $V_{DS(on)}$		500	1000		mA
g_{FS}	Forward Transconductance	V_{DS} = 10 V , I_D = 200 m A		80			mS
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz			22	50	pF
C_{oss}	Output Capacitance				11	25	
C_{rss}	Reverse Transfer Capacitance				2.0	5	
t_{on}	Turn-On Time (Note 4)	V_{DD} = 30 V, R_L = 150 Ω, I_D = 200 mA, V_{gen} = 10 V, R_{GEN} = 25 Ω			7.0	20	nS
t_r	Turn-Off Time (Note 4)				11	20	

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

RATING CHARACTERISTIC CURVES (2N7002EPT)

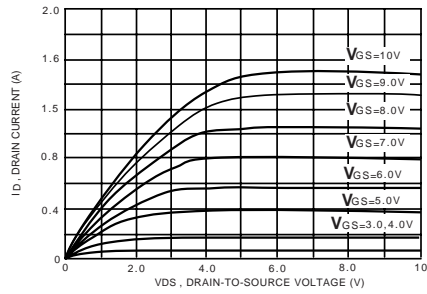**Typical Electrical Characteristics**

Figure 1. Output Characteristics

I D , DRAIN CURRENT (A)

VDS , DRAIN-TO-SOURCE VOLTAGE (V)

V_{GS}=10V
V_{GS}=9.0V
V_{GS}=8.0V
V_{GS}=7.0V
V_{GS}=6.0V
V_{GS}=5.0V
V_{GS}=3.0,4.0V

Figure 2. Transfer Characteristics

I D , DRAIN CURRENT (A)
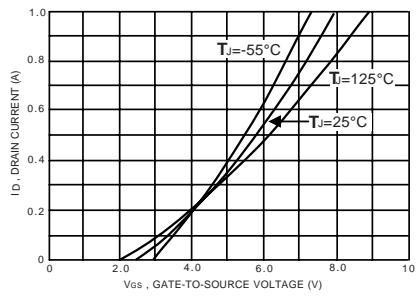
V_{GS} , GATE-TO-SOURCE VOLTAGE (V)

T_J=-55°C
T_J=125°C
T_J=25°C

Figure3. On-Resistance Variation with Temperature

RDS(on) , NORMALIZED DRAIN-SOURCE ON-RESISTANCE

TJ , JUNCTION TEMPERATURE (°C)

V_{GS}=10V
I_D=200mA