



CHENMKO ENTERPRISE CO.,LTD

CHM4204PAPT

SURFACE MOUNT

N-Channel Enhancement Mode Field Effect Transistor

VOLTAGE 40 Volts CURRENT 24 Ampere

Lead free devices

APPLICATION

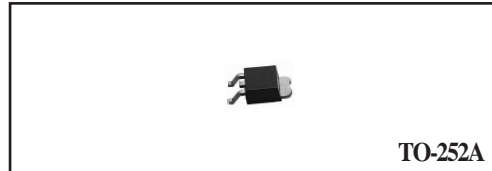
- * Servo motor control.
- * Power MOSFET gate drivers.
- * Other switching applications.

FEATURE

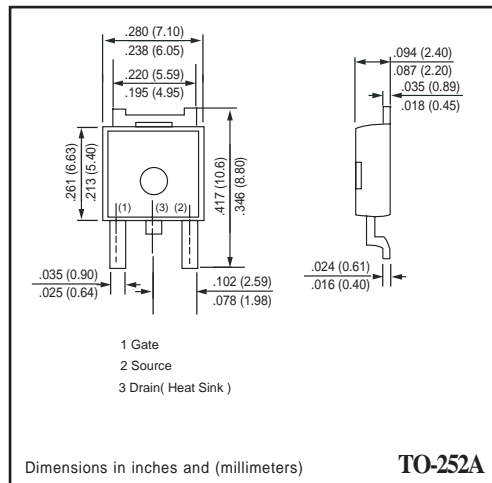
- * Small package. (TO-252A)
- * Super high dense cell design for extremely low $R_{DS(ON)}$.
- * High power and current handling capability.

CONSTRUCTION

- * N-Channel Enhancement

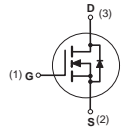


TO-252A



TO-252A

CIRCUIT



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	CHM4204PAPT	Units
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Maximum Drain Current - Continuous	24	A
	- Pulsed (Note 3)	90	
P_D	Maximum Power Dissipation at $T_c = 25^\circ\text{C}$	31	W
T_J	Operating Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

- Note : 1. Surface Mounted on FR4 Board , $t \leq 10\text{sec}$
 2. Pulse Test , Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
 3. Repetitive Rating , Pulse width limited by maximum junction temperature
 4. Guaranteed by design , not subject to production trsting

Thermal characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	50	$^\circ\text{C/W}$
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RATING CHARACTERISTIC CURVES (CHM4204PAPT)

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
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OFF CHARACTERISTICS

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 32\text{ V}, V_{GS} = 0\text{ V}$			1	μA
I_{GSSF}	Gate-Body Leakage	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			+100	nA
I_{GSSR}	Gate-Body Leakage	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$			-100	nA

ON CHARACTERISTICS (Note 2)

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1		4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=6\text{A}$ $V_{GS}=4.5\text{V}, I_D=5\text{A}$		24 34	30 45	$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 6\text{ A}$		10		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		1050		pF
C_{oss}	Output Capacitance			155		
C_{riss}	Reverse Transfer Capacitance			95		

SWITCHING CHARACTERISTICS (Note 4)

Q_g	Total Gate Charge	$V_{DS}=20\text{V}, I_D=6\text{A}$ $V_{GS}=10\text{V}$		20.5	27	nC
Q_{gs}	Gate-Source Charge			3.5		
Q_{gd}	Gate-Drain Charge			4.0		
t_{on}	Turn-On Time	$V_{DD} = 20\text{ V}$ $I_D = 6\text{ A}, V_{GS} = 10\text{ V}$ $R_{GEN} = 3\ \Omega$		14	30	nS
t_r	Rise Time			10	20	
t_{off}	Turn-Off Time			17	35	
t_f	Fall Time			18	35	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I_S	Drain-Source Diode Forward Current			24	A
V_{SD}	Drain-Source Diode Forward Voltage	$I_S = 1\text{ A}, V_{GS} = 0\text{ V}$		1.2	V

RATING CHARACTERISTIC CURVES (CHM4204PAPT)

Typical Electrical Characteristics

Figure 1. Output Characteristics

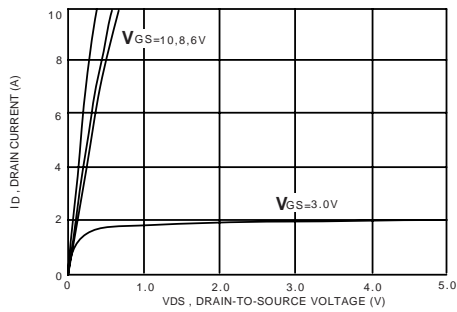


Figure 2. Transfer Characteristics

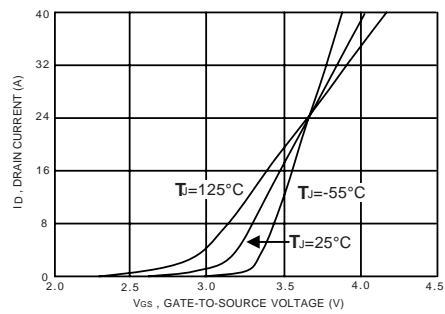


Figure 3. Gate Charge

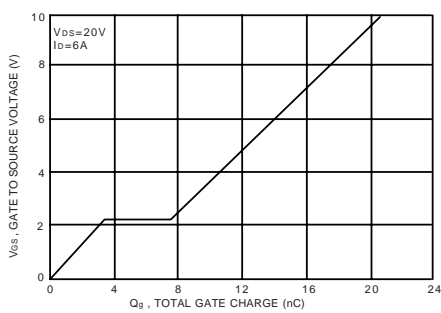


Figure 4. On-Resistance Variation with Temperature

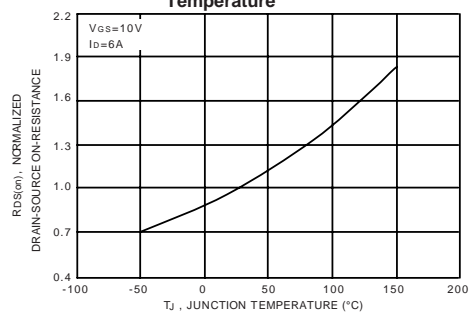


Figure 5. Gate Threshold Variation with Temperature

