



CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT

N-Channel Enhancement Mode Field Effect Transistor

VOLTAGE 30 Volts CURRENT 55 Ampere

CHM6031LPAPT

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.

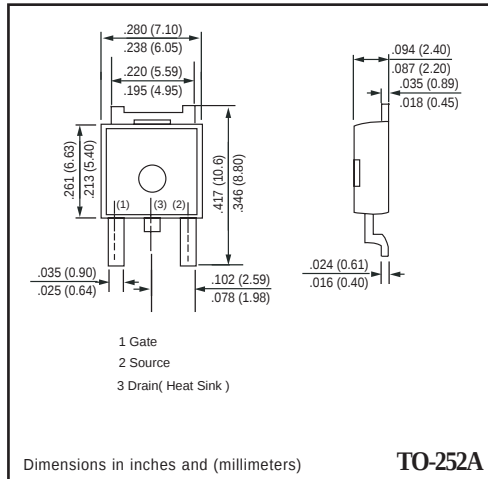
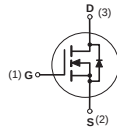
#### CONSTRUCTION

- \* N-Channel Enhancement



TO-252A

#### CIRCUIT



#### Absolute Maximum Ratings

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

| Symbol    | Parameter                                             | CHM6031LPAPT | Units            |
|-----------|-------------------------------------------------------|--------------|------------------|
| $V_{DS}$  | Drain-Source Voltage                                  | 30           | V                |
| $V_{GS}$  | Gate-Source Voltage                                   | $\pm 20$     | V                |
| $I_D$     | Maximum Drain Current - Continuous                    | 55           | A                |
|           | - Pulsed (Note 3)                                     | 140          |                  |
| $P_D$     | Maximum Power Dissipation at $T_c = 25^\circ\text{C}$ | 50           | 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 | $^\circ\text{C/W}$ |
|-----------------|--------------------------------------------------|----|--------------------|

2006-02

## RATING CHARACTERISTIC CURVES ( CHM6031LPAPT )

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|--------|-----------|------------|-----|-----|-----|-------|
|--------|-----------|------------|-----|-----|-----|-------|

### OFF CHARACTERISTICS

|            |                                 |                                                     |    |  |      |               |
|------------|---------------------------------|-----------------------------------------------------|----|--|------|---------------|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage  | $V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$ | 30 |  |      | V             |
| $I_{DSS}$  | Zero Gate Voltage Drain Current | $V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$         |    |  | 1    | $\mu\text{A}$ |
| $I_{GSSF}$ | 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            | $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ | 1 | 1.6 | 3  | V                |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance | $V_{GS}=10\text{V}, I_D=5\text{A}$              |   | 8.5 | 11 | $\text{m}\Omega$ |
|              |                                   | $V_{GS}=4.5\text{V}, I_D=5\text{A}$             |   | 12  | 15 |                  |
| $g_{FS}$     | Forward Transconductance          | $V_{DS} = 10\text{V}, I_D = 26\text{A}$         |   | 32  |    | S                |

### SWITCHING CHARACTERISTICS (Note 4)

|           |                    |                                                                                              |  |     |     |    |
|-----------|--------------------|----------------------------------------------------------------------------------------------|--|-----|-----|----|
| $Q_g$     | Total Gate Charge  | $V_{DS}=24\text{V}, I_D=48\text{A}$<br>$V_{GS}=5\text{V}$                                    |  | 27  | 33  | nC |
| $Q_{gs}$  | Gate-Source Charge |                                                                                              |  | 6   |     |    |
| $Q_{gd}$  | Gate-Drain Charge  |                                                                                              |  | 14  |     |    |
| $t_{on}$  | Turn-On Time       | $V_{DD}= 15\text{V}$<br>$I_D=55\text{A}, V_{GS}= 10\text{ V}$<br>$R_{GEN}= 24\text{ }\Omega$ |  | 10  | 16  | nS |
| $t_r$     | Rise Time          |                                                                                              |  | 190 | 250 |    |
| $t_{off}$ | Turn-Off Time      |                                                                                              |  | 55  | 90  |    |
| $t_f$     | Fall Time          |                                                                                              |  | 130 | 200 |    |

### DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

|          |                                    |                                         |  |      |     |   |
|----------|------------------------------------|-----------------------------------------|--|------|-----|---|
| $I_S$    | Drain-Source Diode Forward Current |                                         |  |      | 55  | A |
| $V_{SD}$ | Drain-Source Diode Forward Voltage | $I_S = 26\text{A}, V_{GS} = 0\text{ V}$ |  | 0.93 | 1.3 | V |