



Halogens free devices

# CHENMKO ENTERPRISE CO.,LTD

## SURFACE MOUNT

### N-Channel Enhancement Mode Field Effect Transistor

VOLTAGE 30 Volts CURRENT 9 Ampere

**CHM4416JGP**

**APPLICATION**

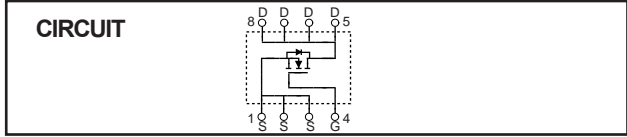
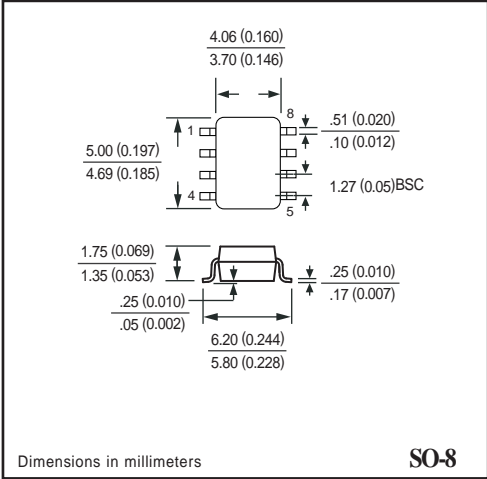
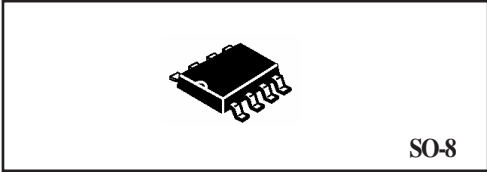
- \* Servo motor control.
- \* Power MOSFET gate drivers.
- \* Other switching applications.

**FEATURE**

- \* Small flat package. (SO-8 )
- \* Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- \* High power and current handling capability.
- \* Lead free product is acquired.

**CONSTRUCTION**

- \* N-Channel Enhancement



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

| Symbol    | Parameter                          | CHM4416JGP | Units            |
|-----------|------------------------------------|------------|------------------|
| $V_{DSS}$ | Drain-Source Voltage               | 30         | V                |
| $V_{GSS}$ | Gate-Source Voltage                | $\pm 20$   | V                |
| $I_D$     | Maximum Drain Current - Continuous | 9          | A                |
|           | - Pulsed (Note 3)                  | 50         |                  |
| $P_D$     | Maximum Power Dissipation          | 2500       | mW               |
| $T_J$     | 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 | $^\circ\text{C/W}$ |
|-----------------|--|----|--------------------|

## ELECTRICAL CHARACTERISTIC ( CHM4416JGP )

**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  | $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$ | 30 |  |      | V             |
| $I_{DSS}$  | Zero Gate Voltage Drain Current | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$   |    |  | 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            | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$ | 1 |    | 3  | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10\text{V}, I_D=9\text{A}$        |   | 15 | 18 | m $\Omega$ |
|              |                                   | $V_{GS}=4.5\text{V}, I_D=7.3\text{A}$     |   | 23 | 28 |            |
| $g_{FS}$     | Forward Transconductance          | $V_{DS} = 15\text{V}, I_D = 9\text{A}$    |   | 14 |    | S          |

### SWITCHING CHARACTERISTICS (Note 4)

|           |                    |  |  |    |    |    |
|-----------|--------------------|--|--|----|----|----|
| $Q_g$     | Total Gate Charge  | $V_{DS}=15\text{V}, I_D=9\text{A}$<br>$V_{GS}=5\text{V}$                                   |  | 15 | 20 | nC |
| $Q_{gs}$  | Gate-Source Charge |  |  | 3  |    |    |
| $Q_{gd}$  | Gate-Drain Charge  |  |  | 7  |    |    |
| $t_{on}$  | Turn-On Time       | $V_{DD}= 15\text{V}$<br>$I_D = 1.0\text{A}, V_{GS} = 10\text{ V}$<br>$R_{GEN} = 6\ \Omega$ |  | 17 | 25 | nS |
| $t_r$     | Rise Time          |  |  | 17 | 20 |    |
| $t_{off}$ | Turn-Off Time      |  |  | 48 | 62 |    |
| $t_f$     | Fall Time          |  |  | 12 | 20 |    |

### DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

|          |                                    |   |  |  |     |   |
|----------|------------------------------------|---|--|--|-----|---|
| $I_S$    | Drain-Source Diode Forward Current | (Note 1)  |  |  | 2.1 | A |
| $V_{SD}$ | Drain-Source Diode Forward Voltage | $I_S = 2.1\text{A}, V_{GS} = 0\text{ V}$ (Note 2) |  |  | 1.0 | V |

# RATING CHARACTERISTIC CURVES ( CHM4416JGP )

## Typical Electrical Characteristics

Figure 1. Output Characteristics

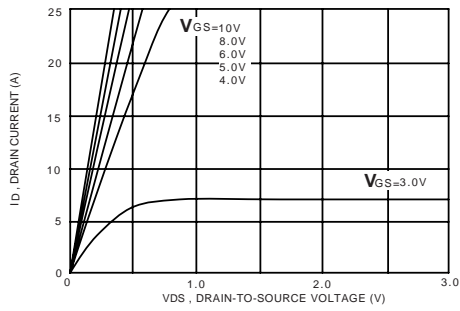


Figure 2. Transfer Characteristics

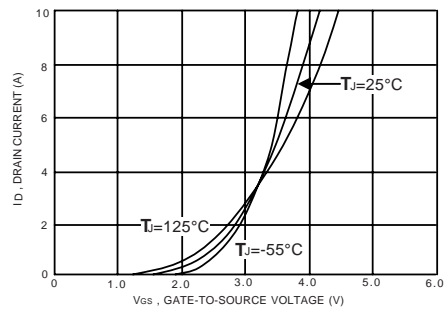


Figure 3. Gate Charge

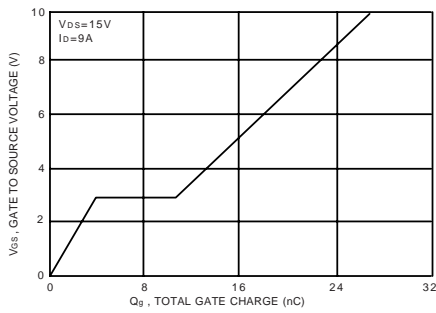


Figure 4. On-Resistance Variation with Temperature

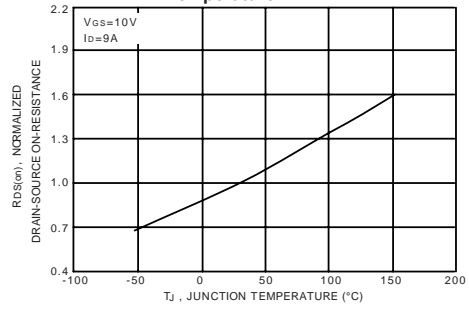


Figure 5. Gate Threshold Variation with Temperature

