



CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT

Dual Enhancement Mode Field Effect Transistor

N-channel: VOLTAGE 30 Volts CURRENT 7 Ampere

P-channel: VOLTAGE 30 Volts CURRENT 6 Ampere

CHM8938JPT

Lead free devices

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 $R_{DS(ON)}$.
- * Lead free product is acquired.
- * High power and current handling capability.

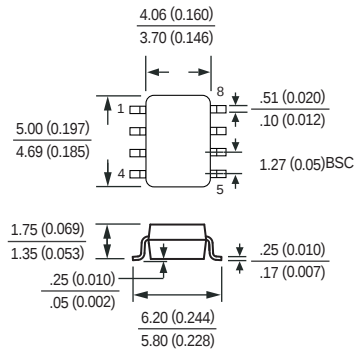
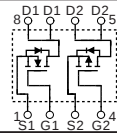
CONSTRUCTION

- * N-Channel & P-Channel Enhancement in the package



SO-8

CIRCUIT



Dimensions in millimeters

SO-8

Absolute Maximum Ratings

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

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Maximum Drain Current - Continuous	7.0	-6.0	A
	- Pulsed (Note 3)	20	-20	
P_D	Maximum Power Dissipation	2000		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 testing

Thermal characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	62.5	$^\circ\text{C/W}$
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2006-02

RATING CHARACTERISTIC CURVES (CHM8938JPT)

N-Channel 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	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			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	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{ V}, I_D=7\text{ A}$		21	26	$\text{m}\Omega$
		$V_{GS}=4.5\text{ V}, I_D=6\text{ A}$		30	38	
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 7\text{ A}$		15		S

SWITCHING CHARACTERISTICS (Note 4)

Q_g	Total Gate Charge	$V_{DS}=15\text{ V}, I_D=7\text{ A}$ $V_{GS}=10\text{ V}$		21	27	nC
Q_{gs}	Gate-Source Charge			2.6		
Q_{gd}	Gate-Drain Charge			4.4		
t_{on}	Turn-On Time	$V_{DD}= 15\text{ V}$ $I_D = 1.0\text{ A}, V_{GS} = 10\text{ V}$ $R_{GEN}= 6\text{ }\Omega$		15	30	nS
t_r	Rise Time			14	28	
t_{off}	Turn-Off Time			94	150	
t_f	Fall Time			39	60	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I_S	Drain-Source Diode Forward Current	(Note 1)			1.3	A
V_{SD}	Drain-Source Diode Forward Voltage	$I_S = 1.3\text{ A}, V_{GS} = 0\text{ V}$ (Note 2)			1.2	V

RATING CHARACTERISTIC CURVES (CHM8938JPT)

P-Channel 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	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$			-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	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1		-3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		30	38	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -4\text{ A}$		44	57	
g_{FS}	Forward Transconductance	$V_{DS} = -5\text{ V}, I_D = -5\text{ A}$		10		S

SWITCHING CHARACTERISTICS (Note 4)

Q_g	Total Gate Charge	$V_{DS} = -15\text{ V}, I_D = -5\text{ A}$ $V_{GS} = -10\text{ V}$		20	25	nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			5		
t_{on}	Turn-On Time	$V_{DD} = -15\text{ V}$ $I_D = -1.0\text{ A}, V_{GS} = -10\text{ V}$ $R_{GEN} = 6\text{ }\Omega$		10	20	nS
t_r	Rise Time			4	10	
t_{off}	Turn-Off Time			58	80	
t_f	Fall Time			23	30	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I_S	Drain-Source Diode Forward Current	(Note 1)			-1.3	A
V_{SD}	Drain-Source Diode Forward Voltage	$I_S = -1.3\text{ A}, V_{GS} = 0\text{ V}$ (Note 2)			-1.2	V