



CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT

CHM9939AJPT

Dual Enhancement Mode Field Effect Transistor

N-channel: VOLTAGE 30 Volts CURRENT 7 Ampere

P-channel: VOLTAGE 30 Volts CURRENT 3.5 Ampere

Lead free devices

APPLICATION

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

FEATURE

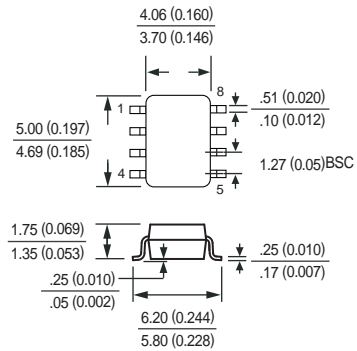
- * Small flat package. (SO-8)
- * Super high dense cell design for extremely low $R_{DS(ON)}$.
- * Lead free product is acquired.
- * High power and current handling capability.

CONSTRUCTION

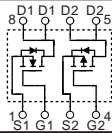
- * N-Channel & P-Channel Enhancement in the package



SO-8



CIRCUIT



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

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DSS}	Drain-Source Voltage	30	-30	V
V_{GSS}	Gate-Source Voltage	± 20	± 20	V
I_D	Maximum Drain Current - Continuous	7.0	-3.5	A
	- Pulsed (Note 3)	30	-14	
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	$^\circ\text{C/W}$
-----------------	--	------	--------------------

2006-02

RATING CHARACTERISTIC CURVES (CHM9939AJPT)

N-Channel 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	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		3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=7\text{A}$		24	30	m Ω
		$V_{GS}=4.5\text{V}, I_D=3.5\text{A}$		32	42	
g_{FS}	Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 7\text{ A}$		10		S

SWITCHING CHARACTERISTICS (Note 4)

Q_g	Total Gate Charge	$V_{DS}=15\text{V}, I_D=2\text{A}$ $V_{GS}=10\text{V}$		20	24	nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			6		
t_{on}	Turn-On Time	$V_{DD}= 25\text{V}$ $I_D = 1.0\text{A}, V_{GS} = 10\text{ V}$ $R_{GEN} = 6\ \Omega$		16	24	nS
t_r	Rise Time			7	14	
t_{off}	Turn-Off Time			47	60	
t_f	Fall Time			10	15	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I_S	Drain-Source Diode Forward Current	(Note 1)			2.3	A
V_{SD}	Drain-Source Diode Forward Voltage	$I_S = 2.0\text{A}, V_{GS} = 0\text{ V}$ (Note 2)			1.1	V

RATING CHARACTERISTIC CURVES (CHM9939AJPT)

P-Channel 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	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$			-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	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1		-3	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = -10\text{ V}, I_D = -3.5\text{ A}$		60	100	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -2\text{ A}$		110	160	
g_{FS}	Forward Transconductance	$V_{DS} = -15\text{ V}, I_D = -3.5\text{ A}$	3	4.5		S

SWITCHING CHARACTERISTICS (Note 4)

Q_g	Total Gate Charge	$V_{DS} = -10\text{ V}, I_D = -3.5\text{ A}$ $V_{GS} = -10\text{ V}$		16	21	nC
Q_{gs}	Gate-Source Charge			2		
Q_{gd}	Gate-Drain Charge			4.5		
t_{on}	Turn-On Time	$V_{DD} = -15\text{ V}$ $I_D = -1.0\text{ A}, V_{GS} = -10\text{ V}$ $R_{GEN} = 6\ \Omega$		20	28	nS
t_r	Rise Time			7	14	
t_{off}	Turn-Off Time			37	50	
t_f	Fall Time			23	32	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

I_S	Drain-Source Diode Forward Current	(Note 1)			-1.7	A
V_{SD}	Drain-Source Diode Forward Voltage	$I_S = -1.7\text{ A}, V_{GS} = 0\text{ V}$ (Note 2)			-1.2	V