



**ZBMCC**

ZIBO MICRO COMMERCIAL  
COMPONENTS CORP.



ADD:ZhangLiu Road No.6  
Zhangdian Zibo Shandong  
P.C.:255000  
Tel:+86-533-3032000/3032005  
Fax:+86-533-3112884

# MCP04N65

## N-Channel Enhancement Mode Field Effect Transistor

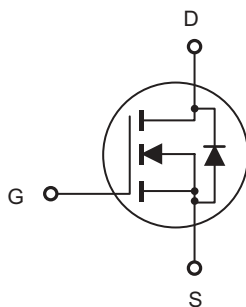
### Features

- High Current Rating
- Lower Capacitance
- Halogen free available upon request by adding suffix "-HF"
- Lower  $R_{DS(ON)}$
- Lower Total Gate Charge
- Tighter VSD Specifications
- Avalanche Energy Specified
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

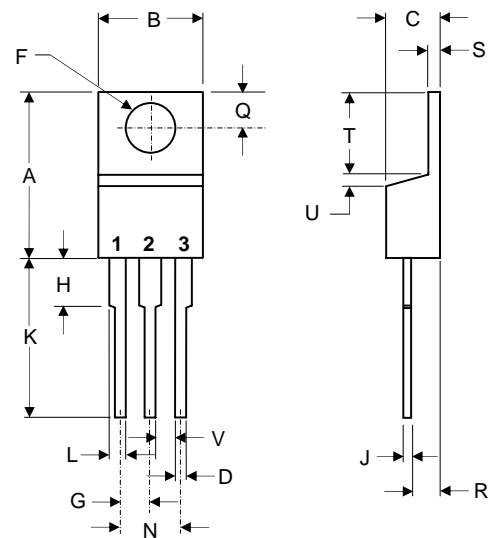
### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	650	V
$I_D$	Drain Current-Continuous	4.0	A
$I_{DM}$	Pulsed Drain Current	16	A
$V_{GSS}$	Gate-source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy(note1)	80	mJ
$P_D$	Total Power Dissipation	2.0	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	$^{\circ}C/W$
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$
$T_L$	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	$^{\circ}C$

### Internal Block Diagram



### TO-220



- 1.GATE
- 2.DRAIN
- 3.SOURCE

DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	.560	.625	14.22	15.88	
B	.380	.420	9.65	10.67	
C	.140	.190	3.56	4.82	
D	.020	.045	0.51	1.14	
F	.139	.161	3.53	4.09	∅
G	.190	.110	2.29	2.79	
H	---	.250	---	6.35	
J	.012	.025	0.30	0.64	
K	.500	.580	12.70	14.73	
L	.045	.060	1.14	1.52	
N	.190	.210	4.83	5.33	
Q	.100	.135	2.54	3.43	
R	.080	.115	2.04	2.92	
S	.045	.055	1.14	1.39	
T	.230	.270	5.84	6.86	
U	-----	.050	-----	1.27	
V	.045	-----	1.15	-----	

**Electrical characteristics ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Drain-source diode forward voltage(note2)	$V_{SD}$	$V_{GS} = 0V, I_S = 4.0A$			1.5	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 600V, V_{GS} = 0V$			25	$\mu A$
Gate-body leakage current, forward(note2)	$I_{GSSF}$	$V_{DS} = 0V, V_{GS} = 30V$			100	nA
Gate-body leakage current, reverse(note2)	$I_{GSSR}$	$V_{DS} = 0V, V_{GS} = -30V$			-100	
<b>On characteristics (note2)</b>						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0		4.0	V
Static drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2.0A$			3.0	$\Omega$

<b>Dynamic characteristics (note 3)</b>						
Input capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$			760	pF
Output capacitance	$C_{oss}$				180	
Reverse transfer capacitance	$C_{rss}$				20	
<b>Switching characteristics</b>						
Total gate charge	$Q_g$	$V_{DS} = 480V, V_{GS} = 10V, I_D = 4.0A$		5.0	10	nC
Gate-source charge	$Q_{gs}$			2.7		
Gate-drain charge	$Q_{gd}$			2.0		
Turn-on delay time (note3)	$t_{d(on)}$	$V_{DD} = 300V, V_{GS} = 10V,$ $R_G = 9.1\Omega, I_D = 4.0A$			20	ns
Turn-on rise time (note3)	$t_r$				10	
Turn-off delay time (note3)	$t_{d(off)}$				40	
Turn-off fall time (note3)	$t_f$				20	

**Notes :**

- $L = 10mH, I_L = 4A, V_{DD} = 50V, V_{GS} = 10V, R_G = 25\Omega, \text{Starting } T_J = 25^{\circ}\text{C}.$
- Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- These parameters have no way to verify.



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### Ordering Information :

Device	Packing
Part Number-BP	Bulk; 1Kpcs/Box

Note : Adding "-HF" suffix for halogen free, eg. Part Number-BP-HF

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