



Micro Commercial Components



Micro Commercial Components  
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# MCP04N60

## N-Channel Enhancement Mode Field Effect Transistor

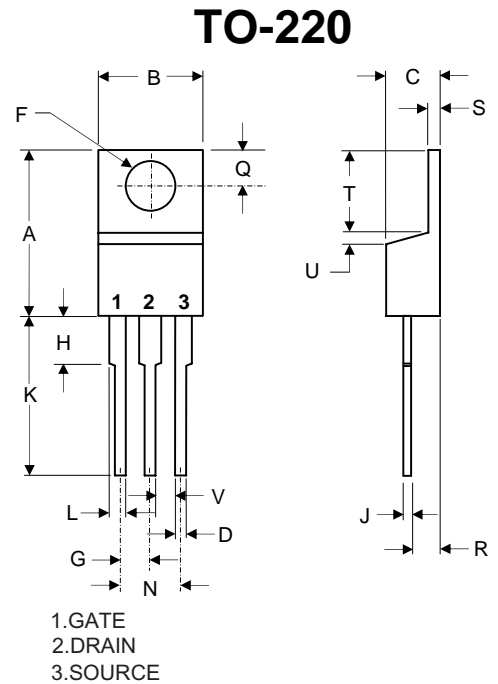
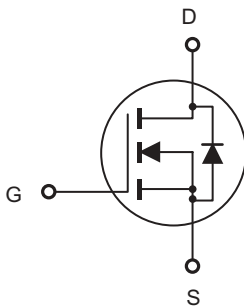
### Features

- 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	600	V
$I_D$	Drain Current-Continuous	4.0	A
$I_S$	Continuous Drain-Source Diode Forward Current	4.0	A
$V_{GSS}$	Gate-source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy(note1)	260	mJ
$R_{\theta JA}$	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



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<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	600			V
Drain-source diode forward voltage(note2)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> =4.0A			1.5	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V			25	μA
Gate-body leakage current, forward(note2)	I <sub>GSSF</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =30V			100	nA
Gate-body leakage current, reverse(note2)	I <sub>GSSR</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V			-100	
<b>On characteristics (note2)</b>						
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A		2.0	3.0	Ω
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =2A	2.5			S
<b>Dynamic characteristics (note 3)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz		540	760	pF
Output capacitance	C <sub>oss</sub>			125	180	
Reverse transfer capacitance	C <sub>rss</sub>			8.0	20	
<b>Switching characteristics</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, V <sub>GS</sub> =10V, I <sub>D</sub> =4.0A		5.0	10	nC
Gate-source charge	Q <sub>gs</sub>			2.7		
Gate-drain charge	Q <sub>gd</sub>			2.0		
Turn-on delay time (note3)	t <sub>d(on)</sub>	V <sub>DD</sub> =300V, V <sub>GS</sub> =10V, R <sub>G</sub> =9.1Ω, I <sub>D</sub> =4.0A		12	20	ns
Turn-on rise time (note3)	t <sub>r</sub>			7.0	10	
Turn-off delay time (note3)	t <sub>d(off)</sub>			19	40	
Turn-off fall time (note3)	t <sub>f</sub>			10	20	

**Notes :**

- L=30mH, I<sub>L</sub>=4 A, V<sub>DD</sub>=100V, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
- Pulse Test : Pulse width≤300μs, duty cycle ≤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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