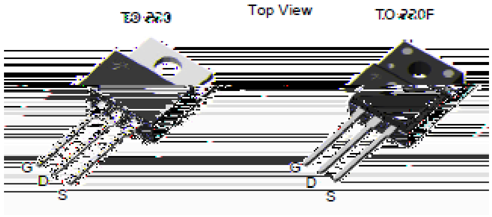
TMP4N65AZ(G)/TMPF4N65AZ(G)

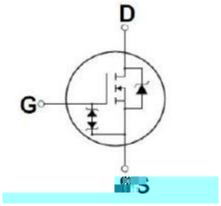
Features

- Low gate charge
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant
- Halogen free package
- JEDEC Qualification
- Improved ESD performance

N-channel MOSFET

BV_{DSS}	I_D	$R_{DS(on)}$
650V	4.0A	< 2.4Ω





Device	Package	Marking	Remark
TMP4N65AZ / TMPF4N65AZ	TO-220 / TO-220F	TMP4N65AZ / TMPF4N65AZ	RoHS
TMP4N65AZG / TMPF4N65AZG	TO-220 / TO-220F	TMP4N65AZG / TMPF4N65AZG	Halogen Free

Absolute Maximum Ratings

Parameter		Symbol	TMP4N65AZ(G)	TMPF4N65AZ(G)	Unit
Drain-Source Voltage		V_{DSS}	650		V
Gate-Source Voltage		V_{GS}	30		V
Continuous Drain Current	T_C = 25	I_D	4	4 *	A
	T_C = 100		2.63	2.63 *	A
Pulsed Drain Current (Note 1)		I_{DM}	16	16 *	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	206		mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	4		A
Repetitive Avalanche Energy (Note 1)		E_{AR}	9.84		mJ
Power Dissipation	T_C = 25	P_D	98.4	32.8	W
	Derate above 25		0.78	0.26	W/
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5		V/ns
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150		
Maximum lead temperature for soldering purposes,		T_L	300		

* Limited only by maximum junction temperature

Thermal Characteristics

Parameter	Symbol	TMP4N65AZ(G)	TMPF4N65AZ(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	1.27	3.8	/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	/W

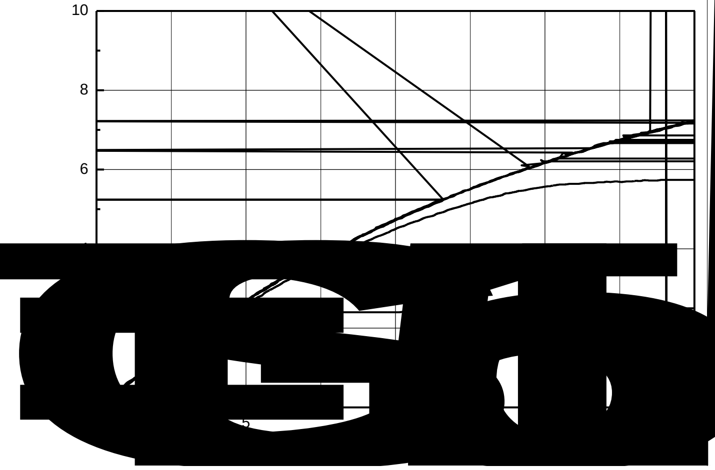
Electrical Characteristics : T_C=25 , unless otherwise noted

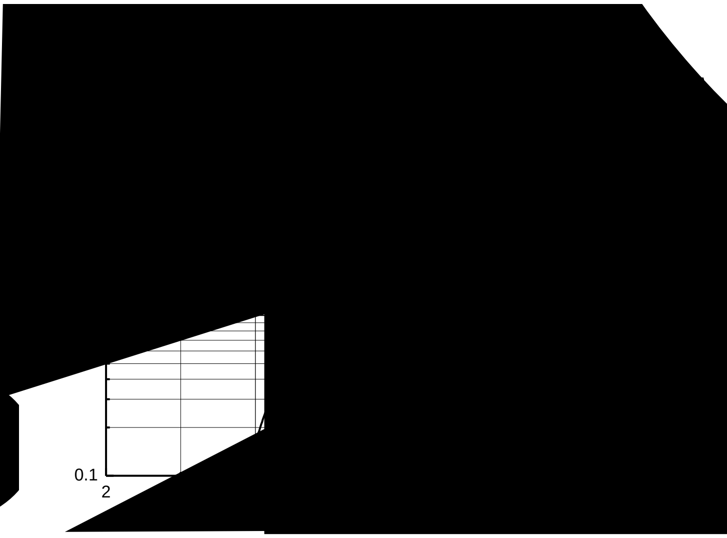
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 520 V, T_C = 125°C	--	--	10	µA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	µA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	µA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA				

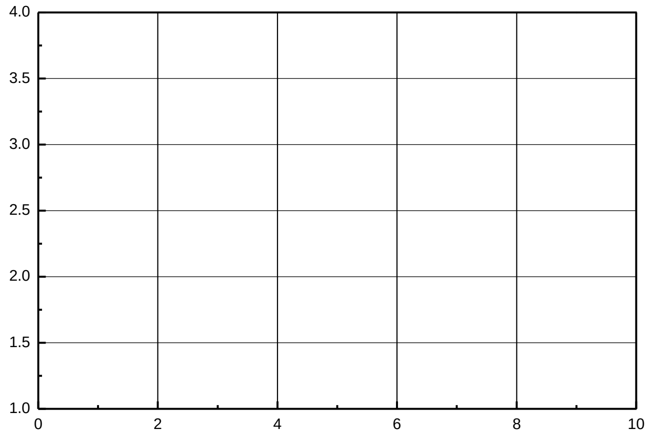
Note :

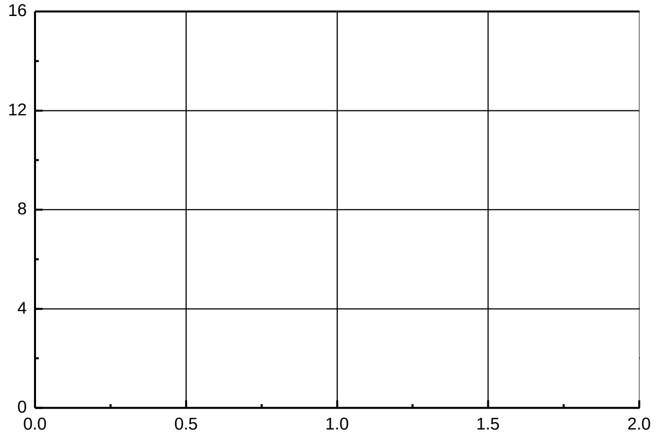
1. Repeated rating : Pulse width limited by safe operating area
2. L=23.8mH, I_{AS} = 4.0A, V_{DD} = 50V, R_G = 25 , Starting T_J= 25
3 I_{SD} 4.0A, di/dt µs , V_{DD} $_{DS}$, Starting T_J= 25
µ
5. Essentially Independent of Operating Temperature Typical Characteristics

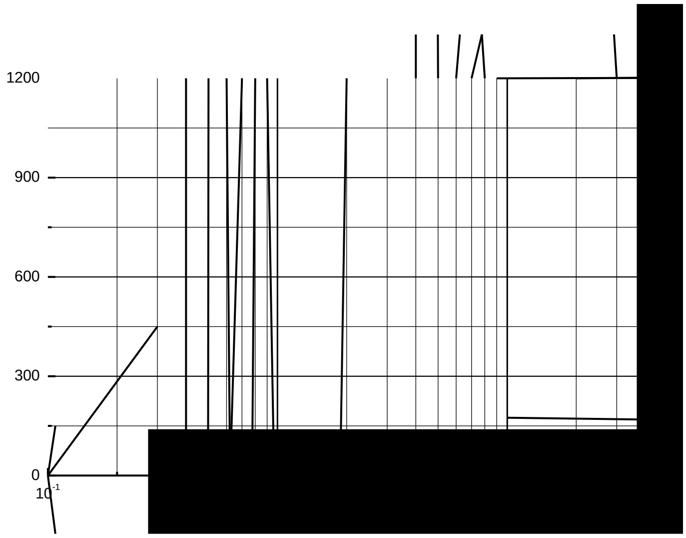
GS

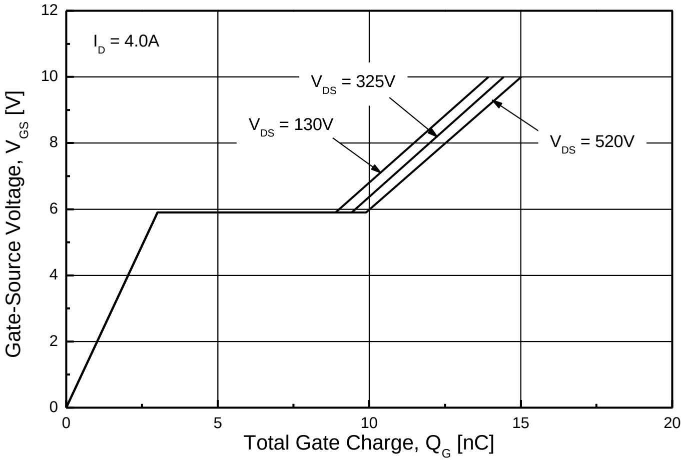

10
8
6
5

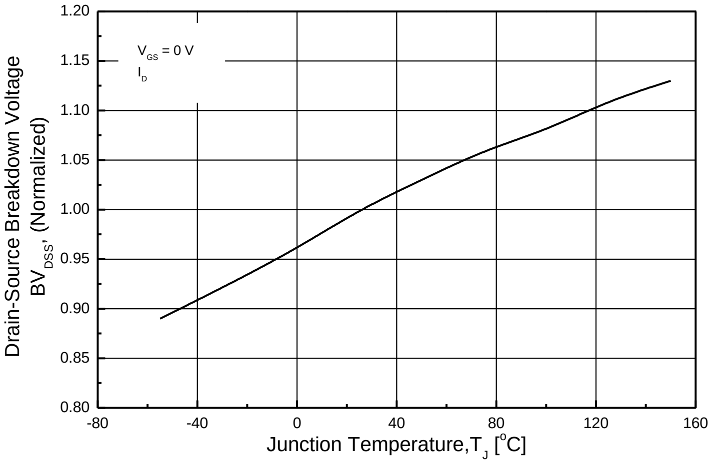

0.1
2

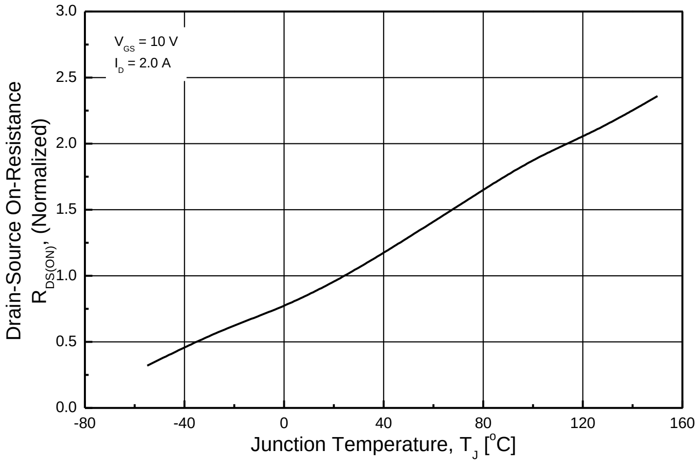

4.0
3.5
3.0
2.5
2.0
1.5
1.0
0
2
4
6
8
10

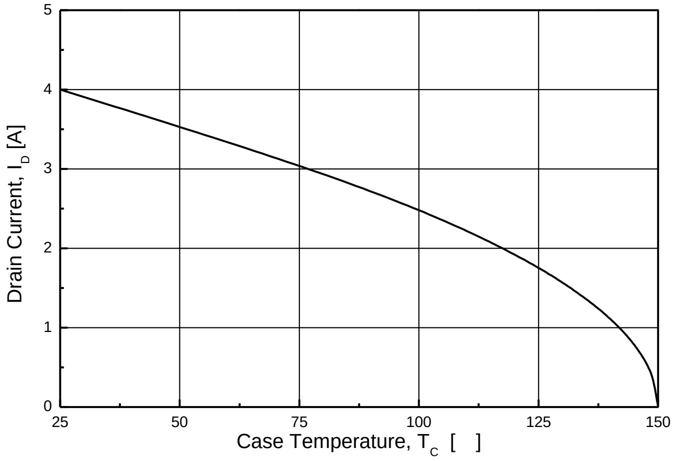

16
12
8
4
0
0.0
0.5
1.0
1.5
2.0

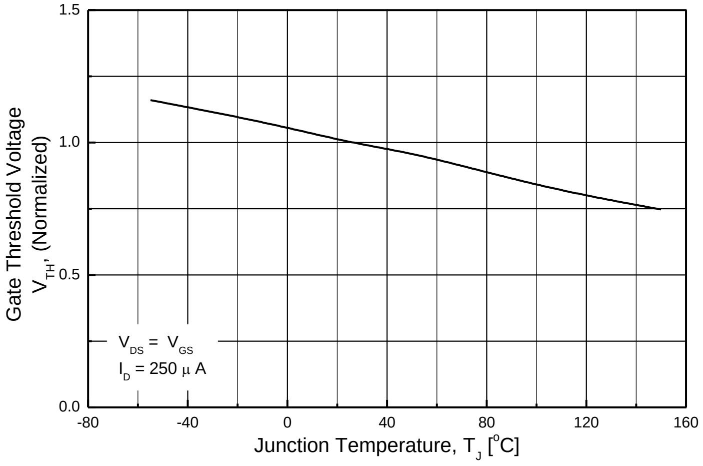

1200
900
600
300
0
10-1

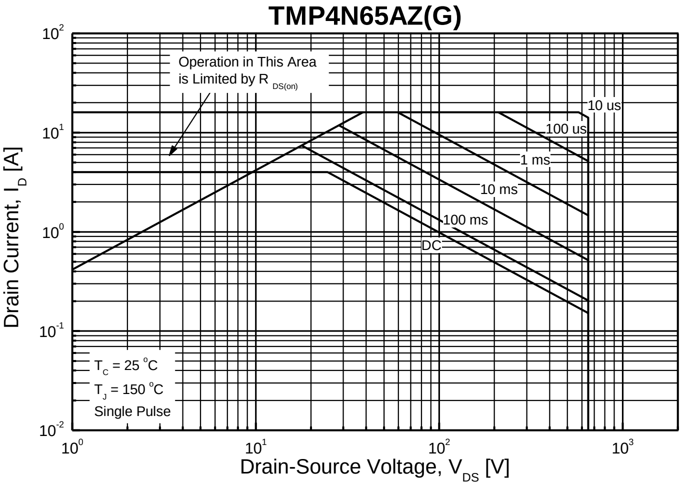

I_D = 4.0A
V_DS = 325V
V_DS = 130V
V_DS = 520V
Gate-Source Voltage, V_GS [V]
12
10
8
6
4
2
0
0
5
10
15
20
Total Gate Charge, Q_G [nC]

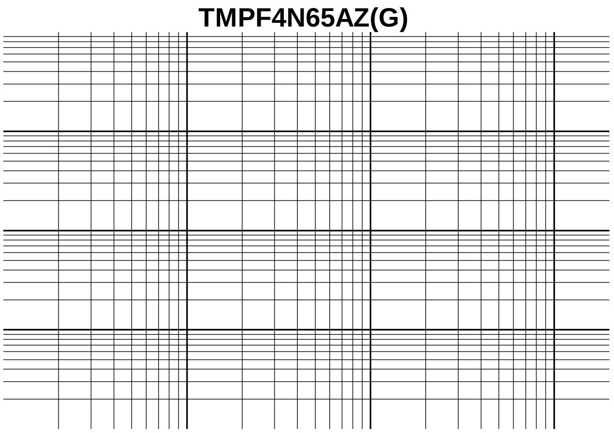

Drain-Source Breakdown Voltage
BV_{DSS}, (Normalized)
V_{GS} = 0 V
I_D
1.20
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80
-80
-40
0
40
80
120
160
Junction Temperature,T_J [°C]

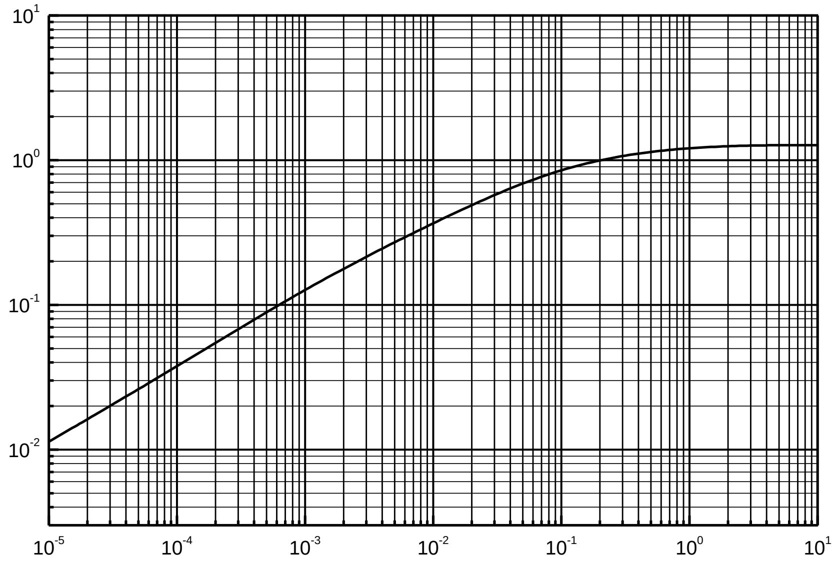

Drain-Source On-Resistance
$R_{DS(ON)}$, (Normalized)
V_{GS} = 10 V
I_D = 2.0 A
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-80
-40
0
40
80
120
160
Junction Temperature, T_J [°C]


Drain Current, I_D [A]
5
4
3
2
1
0
25
50
75
100
125
150
Case Temperature, T_C [ ]

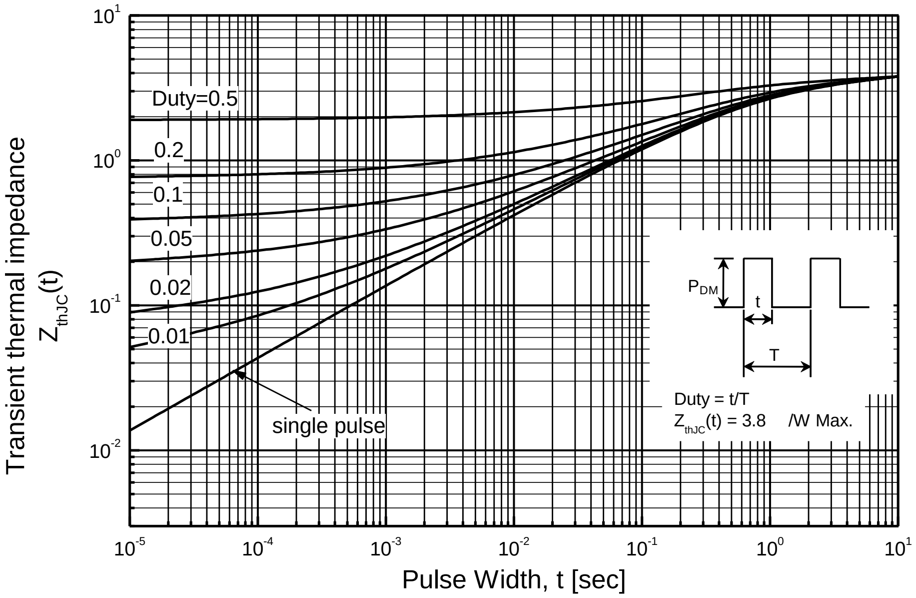

Gate Threshold Voltage
V_{TH}, (Normalized)
V_{DS} = V_{GS}
I_D = 250 μ A
1.5
1.0
0.5
0.0
-80
-40
0
40
80
120
160
Junction Temperature, T_J [°C]


TMP4N65AZ(G)
Drain Current, I_D [A]
Operation in This Area
is Limited by $R_{DS(on)}$
10 us
100 us
1 ms
10 ms
100 ms
DC
T_C = 25 °C
T_J = 150 °C
Single Pulse
10^2
10^1
10^0
10^{-1}
10^{-2}
10^0
10^1
10^2
10^3
Drain-Source Voltage, V_{DS} [V]


TMPF4N65AZ(G)

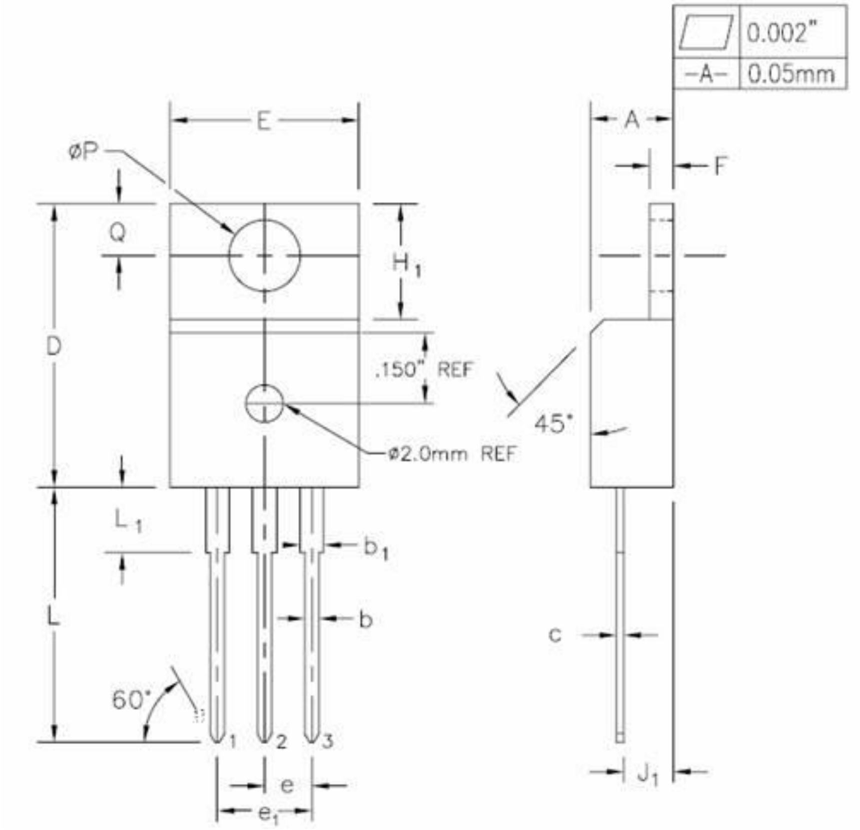


TMP4N65AZ(G)



TMPF4N65AZ(G)

TO-220AB-3L MECHANICAL DATA



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.170	0.180	4.32	4.57	
b	0.028	0.036	0.71	0.91	
b1	0.045	0.055	1.15	1.39	
c	0.014	0.021	0.36	0.53	
D	0.590	0.610	14.99	15.49	
E	0.395	0.410	[illegible]	10.41	
e	0.100 TYP.		2.54 TYP.		
e1	0.200 BSC		5.08 BSC		
F	0.048	0.054	1.22	1.37	
H1	0.235	0.255	5.97	6.47	
J1	0.100	0.110	2.54	2.79	
L	0.530	0.550	13.47	13.97	
L1	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	
Q	0.102	0.112	2.60	2.84	

TO-220F-3L MECHANICAL DATA