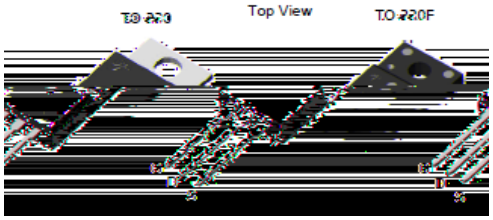
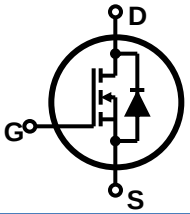
TMP6N65/TMPF6N65
TMP6N65G/TMPF6N65G

Features

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

V_{DSS} = 715 V @T_{jmax}
I_D = 5.5A
$R_{DS(on)}$ = 1.6 Ω(max) @ V_{GS}= 10 V





Device	Package	Marking	Remark
TMP6N65 / TMPF6N65	TO-220 / TO-220F	TMP6N65 / TMPF6N65	RoHS
TMP6N65G / TMPF6N65G	TO-220 / TO-220F	TMP6N65G / TMPF6N65G	Halogen Free

Absolute Maximum Ratings

Parameter		Symbol	TMP6N65(G)	TMPF6N65(G)	Unit
Drain-Source Voltage		V_{DSS}	650		V
Gate-Source Voltage		V_{GS}	±30		V
Continuous Drain Current	T_C = 25 ℃	I_D	5.5	5.5 *	A
	T_C = 100 ℃		3.46	3.46 *	A
Pulsed Drain Current (Note 1)		I_{DM}	22	22*	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	196.6		mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	5.5		A
Repetitive Avalanche Energy (Note 1)		E_{AR}	12		mJ
Power Dissipation	T_C = 25 ℃	P_D	120	39	W
	Derate above 25 ℃		0.96	0.31	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, 1/8" from case for 5 seconds		T_L	300		℃

* Limited only by maximum junction temperature

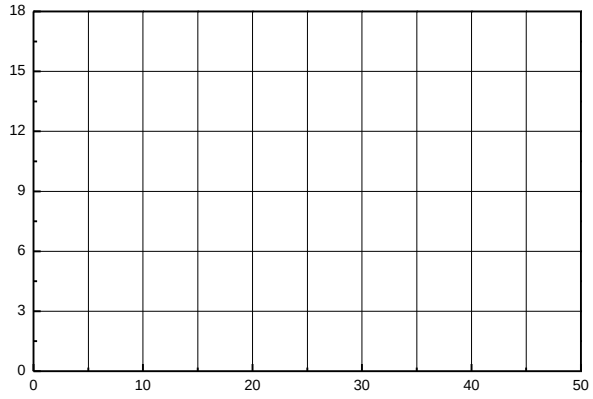
Thermal Characteristics

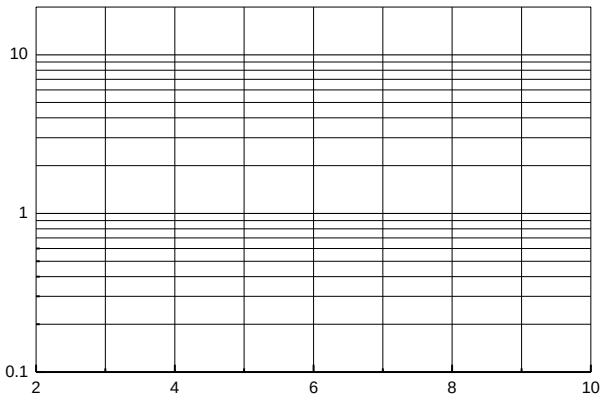
Parameter	Symbol	TMP6N65(G)	TMPF6N65(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	1.04	3.2	℃/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	℃/W

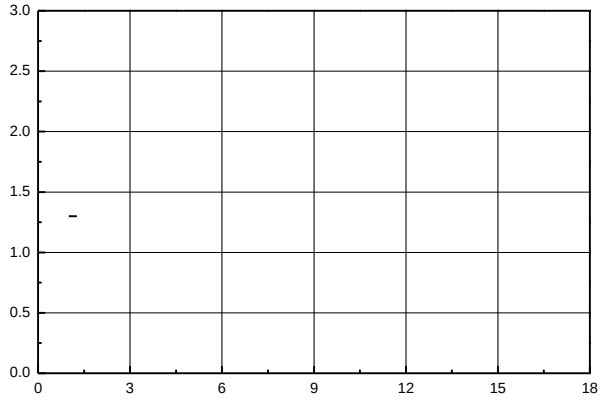
Electrical Characteristics : T_C=25℃, unless otherwise noted

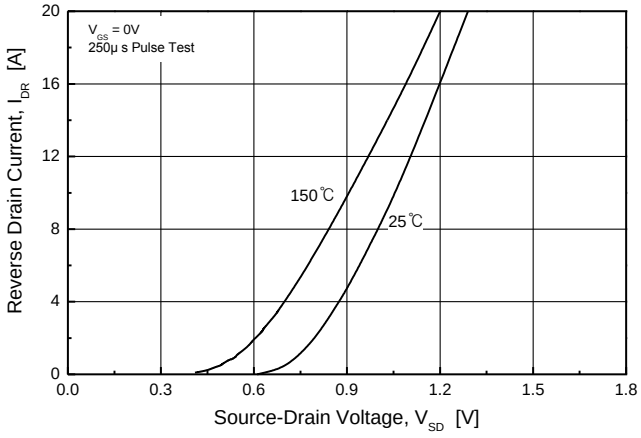
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 520 V, T_C = 125°C	--	--	10	µA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 2.75 A	--	R 1.28	1.6	

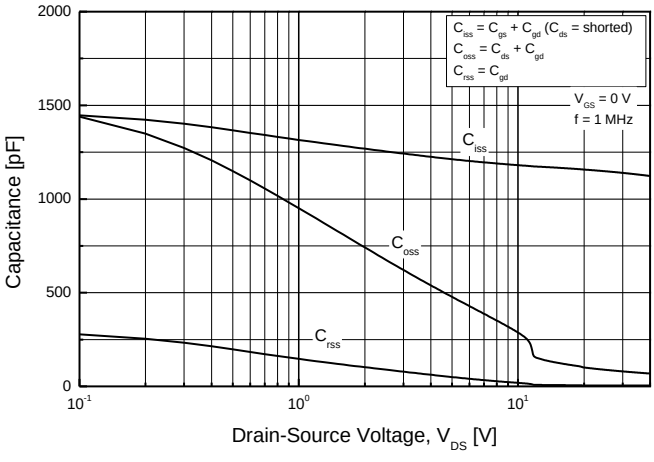
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=12mH, I_{AS} = 5.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25℃
3 I_{SD} ≤ 5.5A, di/dt ≤ 200A/µs , V_{DD} ≤ BV_{DS}, Starting T_J= 25 ℃
4. Pulse Test :Pulse width ≤ 300µs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

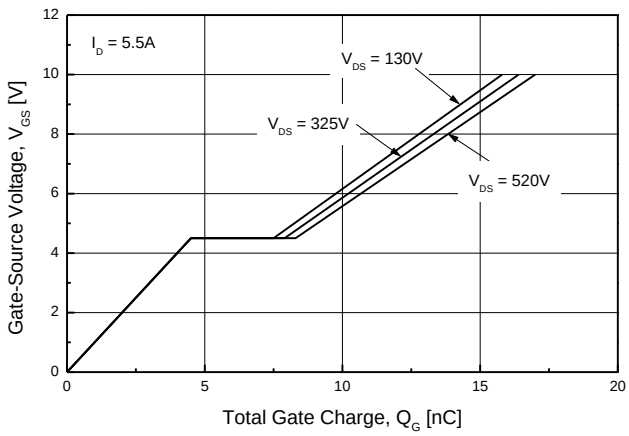

18
15
12
9
6
3
0
0
10
20
30
40
50

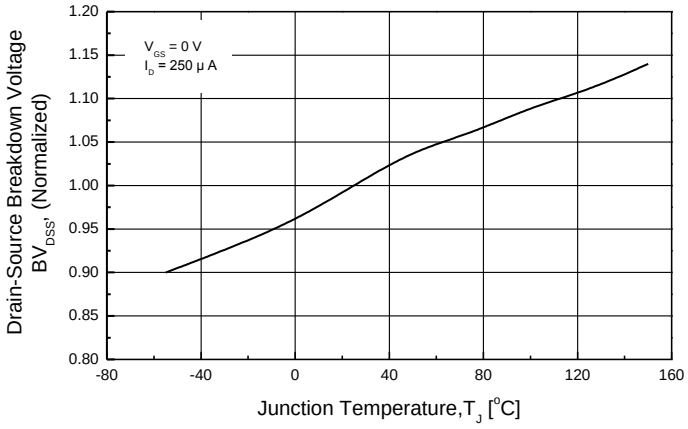

10
1
0.1
2
4
6
8
10

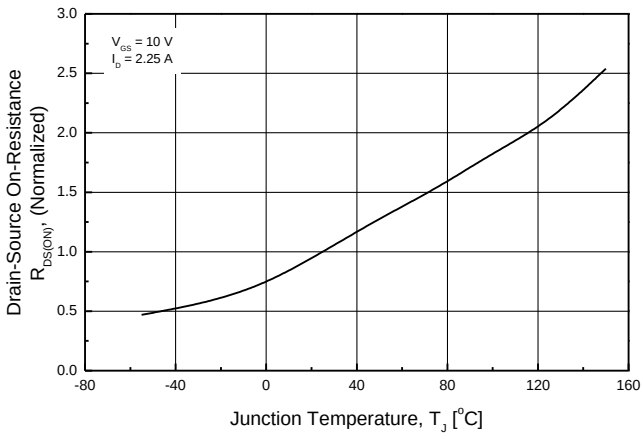

3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
3
6
9
12
15
18

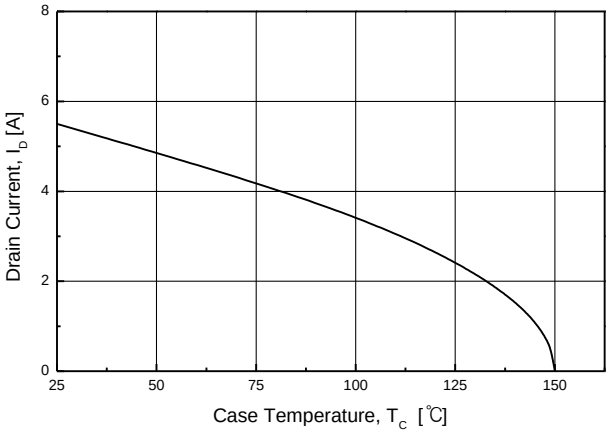

V_{GS} = 0V
250μ s Pulse Test
150℃
25℃
Reverse Drain Current, I_{DR} [A]
Source-Drain Voltage, V_{SD} [V]
20
16
12
8
4
0
0.0
0.3
0.6
0.9
1.2
1.5
1.8

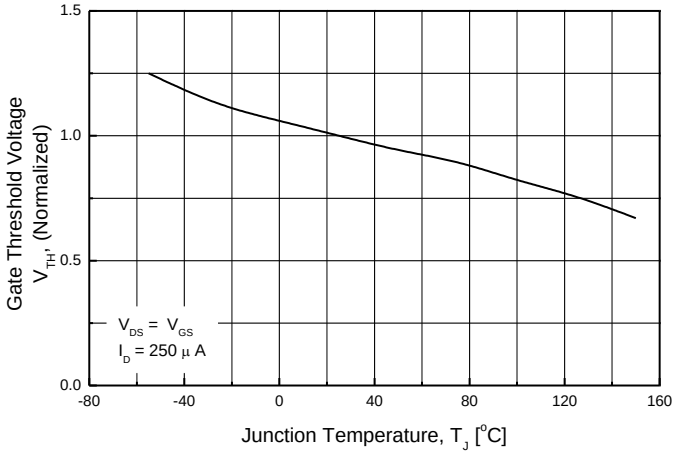

C_{iss} = C_{gs} + C_{gd} (C_{ds} = shorted)
C_{oss} = C_{ds} + C_{gd}
C_{rss} = C_{gd}
V_{GS} = 0 V
f = 1 MHz
C_{iss}
C_{oss}
C_{rss}
Capacitance [pF]
Drain-Source Voltage, V_{DS} [V]
2000
1500
1000
500
0
10^{-1}
10^{0}
10^{1}


I_D = 5.5A
V_{DS} = 130V
V_{DS} = 325V
V_{DS} = 520V
Gate-Source Voltage, V_{GS} [V]
Total Gate Charge, Q_G [nC]
12
10
8
6
4
2
0
0
5
10
15
20

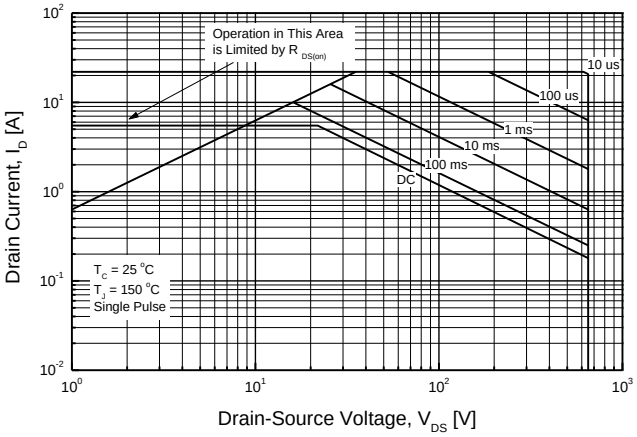








TMP6N65(G)



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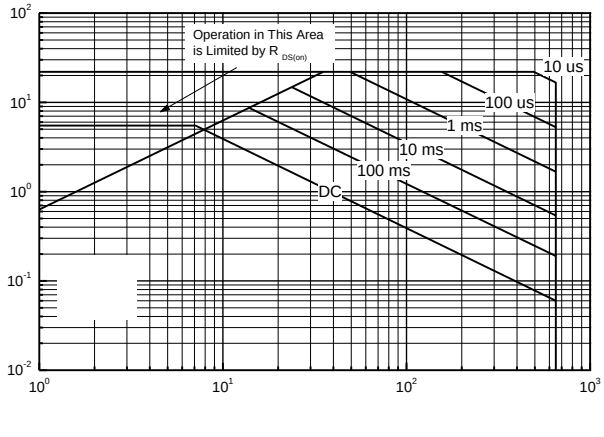

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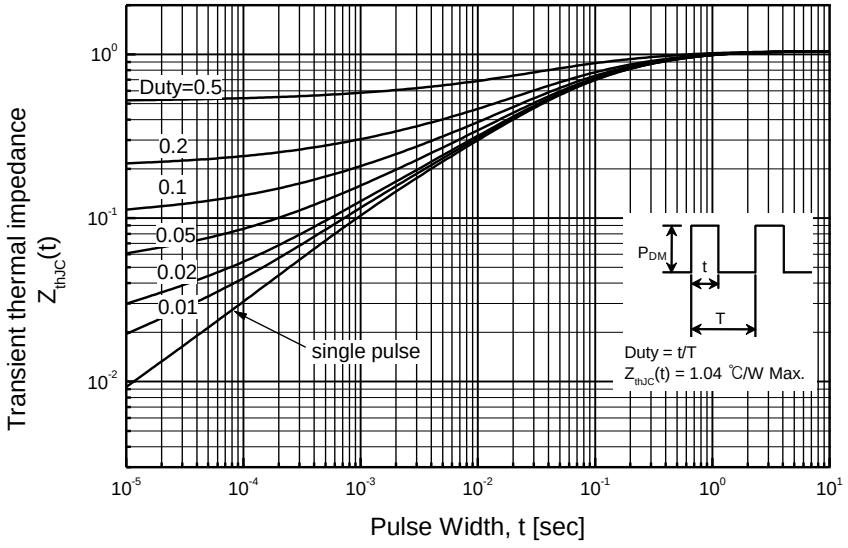

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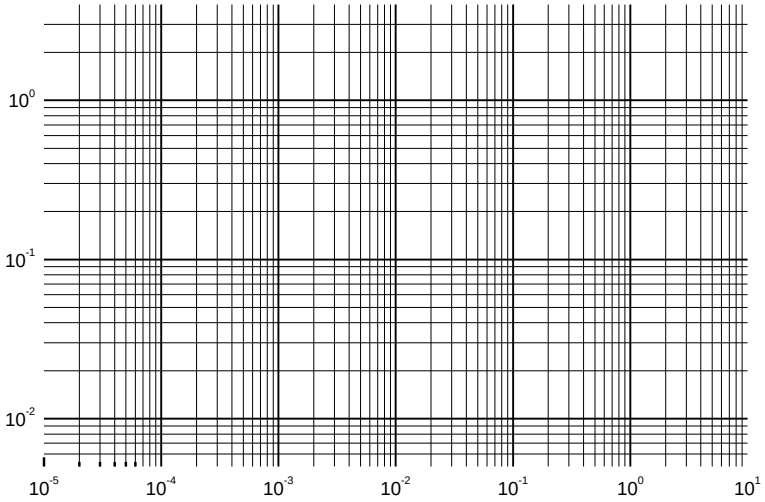
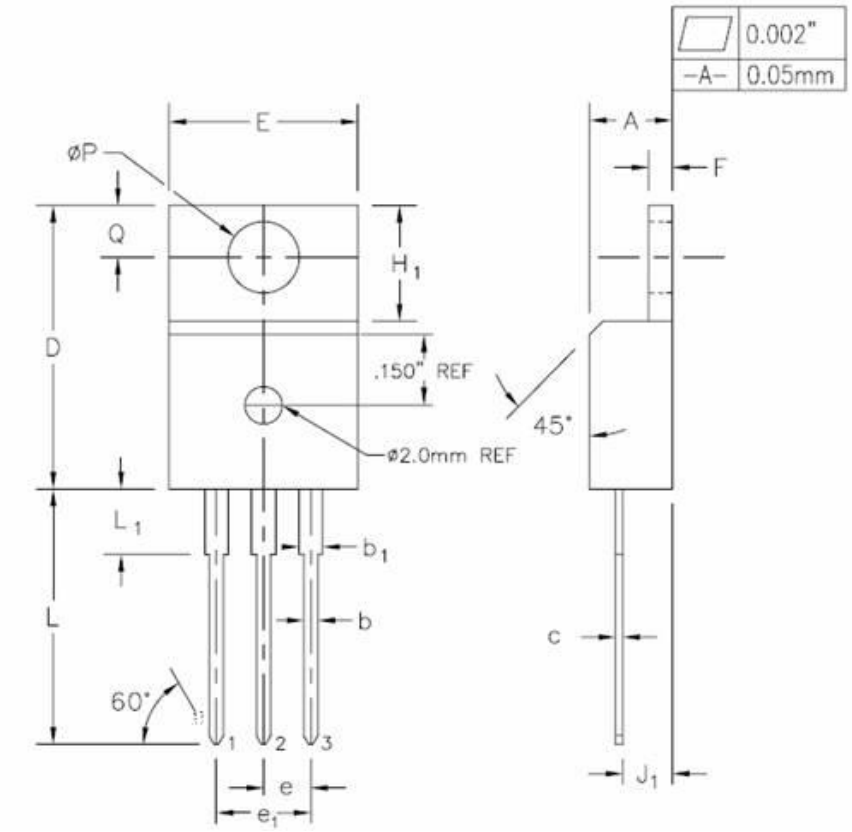
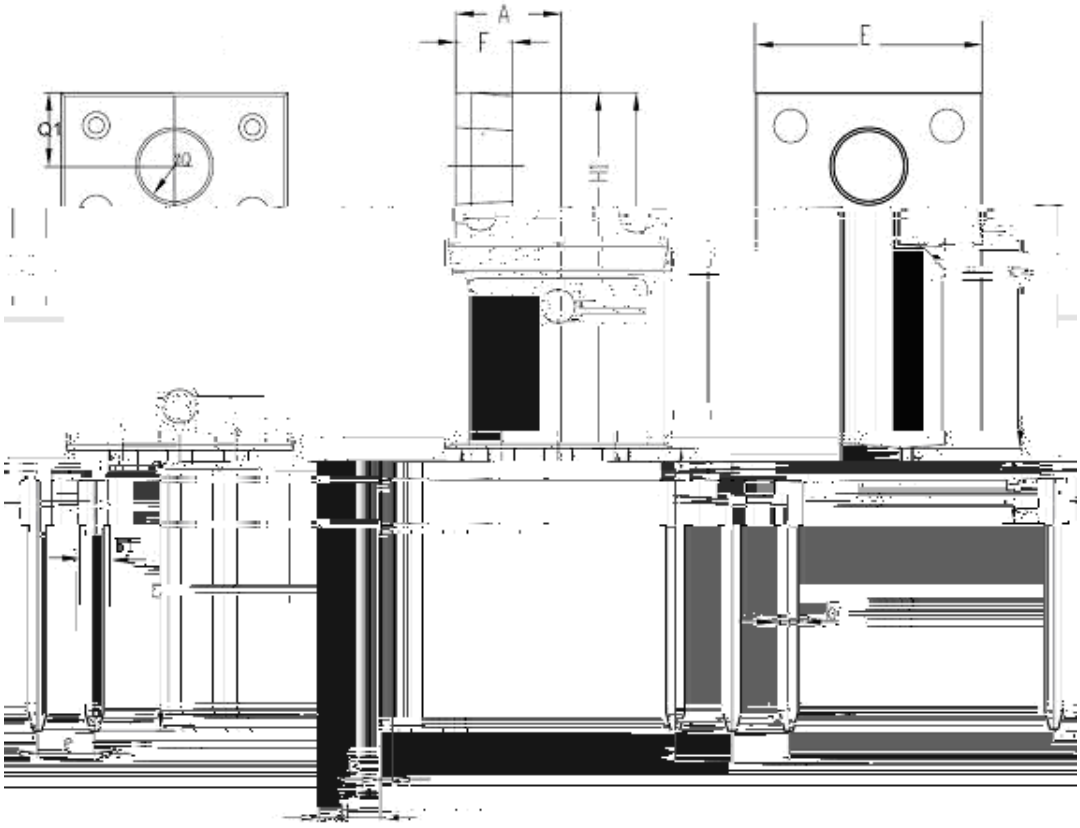


TO-220AB-3L MECHANICAL DATA



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	
b_1	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	10.04	10.41	
e	0.100 TYP.		2.54 TYP.		
e_1	0.200 BSC		5.08 BSC		
F	0.048	0.054	1.22	1.37	
H_1	0.235	0.255	5.97	6.47	
J_1	0.100	0.110	2.54	2.79	
L	0.530	0.550	13.47	13.97	
L_1	0.130	0.150	3.31	3.81	
øP	0.140	0.153	3.56	3.88	
Q	0.102	0.112	2.60	2.84	

TO-220F-3L MECHANICAL DATA



NC M!	JODI F !		NJMMJNF F !!		O F !
	NJO!	NB !	NJO!	NB !	
B!	1 289!!	1 2 5!!	5 64!!	5 4!!	!
!	1 139!!	1 147!!	1 82!!	1 2!!	!
D!	1 129!	1 135!	1 56!	1 71!	!
E!	1 728!!	1 744!!	26 78!!	27 18!!	!
F!	1 4 3!!	1 519!!	7!!	21 47!!	!
!	1 211! !		3 65 !		!
I 2!	1 367!!	1 383!!	7 61!!	7 1!!	!
2!	1 21 2!!	1 228!!	3 67!!	3 7!!	!
M!	1 614!!	1 62 !!	23 89!!	24 29!!	!
φQ!	1 228!!	1 244!!	3 9!!	4 49!!	!
2!	1 156!!	1 166!!	2 26!!	2 4 !!	!
M2!	1 225!	1 241!!	3 !!	4 4!!	!
2!	1 233!!	1 249!!	4 21!!	4 61!!	!
!	1 1 3!	1 219!	3 45!	3 85!	