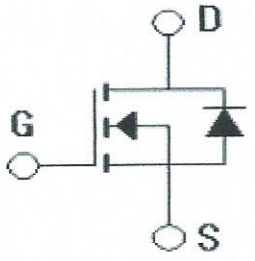
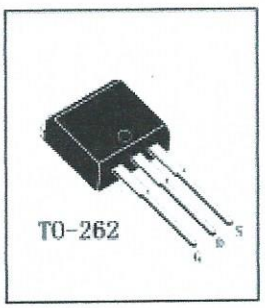
JCS740

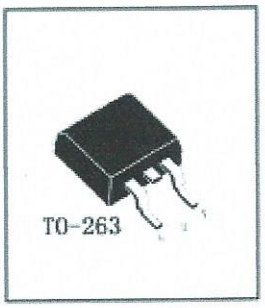
MAIN CHARACTERISTICS

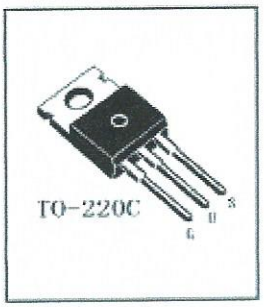
I_D	10 A
V_{DSS}	400 V
Rdson(@Vgs=10V)	0.54 Ω
Qg	60 nC

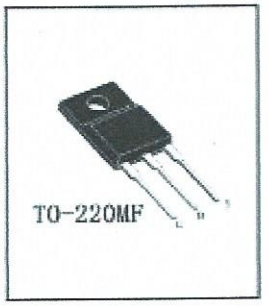
Package











APPLICATIONS

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS

FEATURES

- Low gate charge
- Low C_{rss} (typical 35pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

ORDER MESSAGE

Order codes	Marking	Package	Halogen Free	Packaging	Device Weight
JCS740S-O-S-N-B	JCS740S	TO-263	NO	Tube	1.37 g(typ)
JCS740B-O-B-N-B	JCS740B	TO-262	NO	Tube	1.71 g(typ)
JCS740C-O-C-N-B	JCS740C	TO-220C	NO	Tube	2.15 g(typ)
JCS740F-O-F-N-B	JCS740F	TO-220MF	NO	Tube	2.20 g(typ)

ABSOLUTE RATINGS (Tc=25℃)

Parameter	Symbol	Value		Unit
		JCS740S/B/C	JCS740F	
Drain-Source Voltage	V_{DSS}	400		V
Drain Current -continuous	I_D T=25℃	10	10*	A
	T=100℃	6.3	6.3*	A
Drain Current - pulse (note 1)	I_{DM}	40	40*	A
Gate-Source Voltage	V_{GSS}	±30		V
Single Pulsed Avalanche Energy (note 2)	E_{AS}	450		mJ
Avalanche Current (note 1)	I_{AR}	10		A
Repetitive Avalanche Current (note 1)	E_{AR}	13.4		mJ
Peak Diode Recovery dv/dt (note 3)	dv/dt	5.5		V/ns
Power Dissipation	P_D T_C=25℃	134	44	W
	-Derate above 25℃	1.08	0.35	W/℃
Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150		℃
Maximum Lead Temperature for Soldering Purposes	T_L	300		℃

*Drain current limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off –Characteristics						
Drain-Source Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	400	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA, referenced to 25℃	-	0.4	-	V/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=400V,V_{GS}=0V, T_C=25℃	-	-	10	μA
		V_{DS}=320V, T_C=125℃	-	-	100	μA
Gate-body leakage current, forward	I_{GSSF}	V_{DS}=0V, V_{GS} =30V	-	-	100	nA
Gate-body leakage current, reverse	I_{GSSR}	V_{DS}=0V, V_{GS} =-30V	-	-	-100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D=250μA	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V , I_D=5.0A	-	0.43	0.54	Ω
Forward Transconductance	g_{fs}	V_{DS} = 40V, I_D=5.0A（note 4）	-	9.6	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS} =0V, f=1.0MHz	-	1400	1800	pF
Output capacitance	C_{oss}		-	150	195	pF
Reverse transfer capacitance	C_{rss}		-	35	45	pF

ELECTRICAL CHARACTERISTICS

Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DD}=200V,I_D=10A,R_G=25Ω (note 4，5)	-	20	50	ns
Turn-On rise time	t_r		-	80	170	ns
Turn-Off delay time	$t_{d(off)}$		-	125	260	ns
Turn-Off Fall time	t_f		-	85	180	ns
Total Gate Charge	Q_g	V_{DS} =320V , I_D=10A V_{GS} =10V (note 4，5)	-	60	71	nC
Gate-Source charge	Q_{gs}		-	7.4	-	nC
Gate-Drain charge	Q_{gd}		-	27	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain -Source Diode Forward Current	I_S		-	-	10	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	40	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=10A	-	1.5	-	V
Reverse recovery time	t_{rr}	V_{GS}=0V, I_S=10A dI_F/dt=100A/μs (note 4)	-	330	-	ns
Reverse recovery charge	Q_{rr}		-	3.57	-	μC

THERMAL CHARACTERISTIC

Parameter	Symbol	Max		Unit
		JCS740S/B/C	JCS740F	
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.93	2.86	℃/W
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	62.5	℃/W

Notes:

1： Pulse width limited by maximum junction temperature

2： L=7.9mH, I_{AS}=10A, V_{DD}=50V, R_G=25 Ω,Starting T_J=25℃

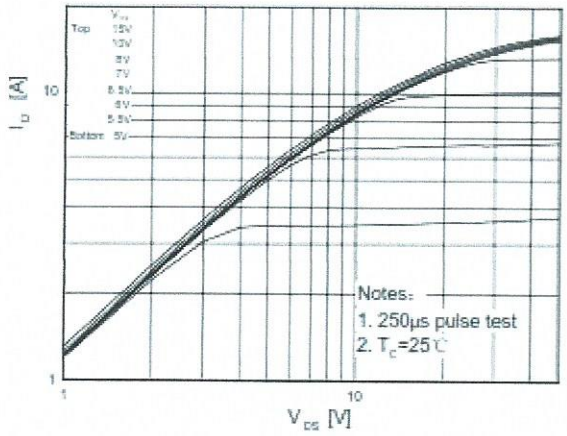
3： I_{SD} ≤10A,di/dt ≤300A/μs,VDD≤BV_{DSS}, Starting T_J=25℃

4： Pulse Test： Pulse Width ≤300μs,Duty Cycle≤2%

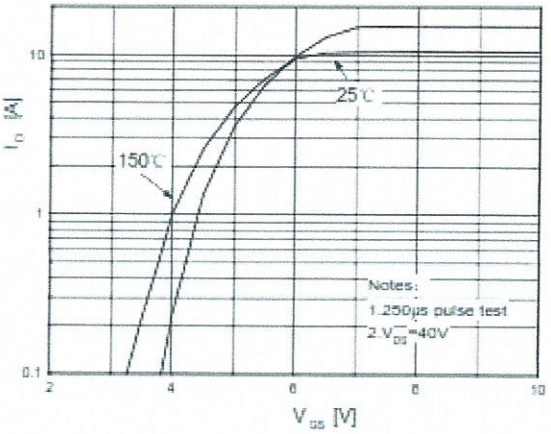
5： Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

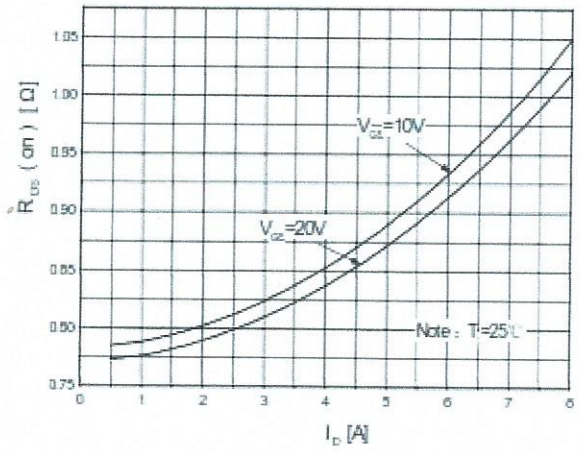
On-Region Characteristics



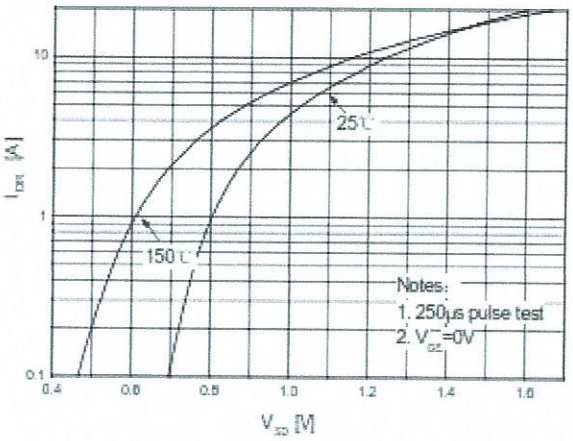
Transfer Characteristics



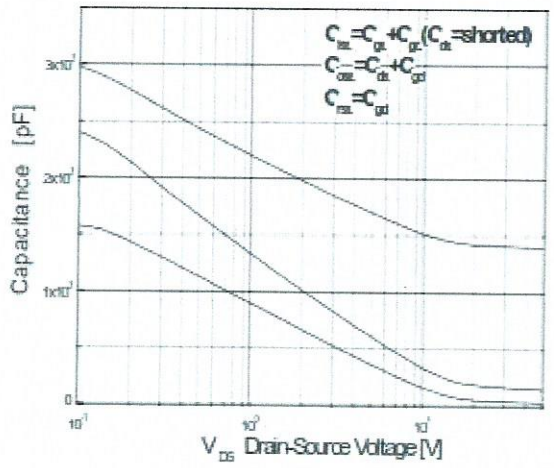
On-Resistance Variation vs. Drain Current and Gate Voltage



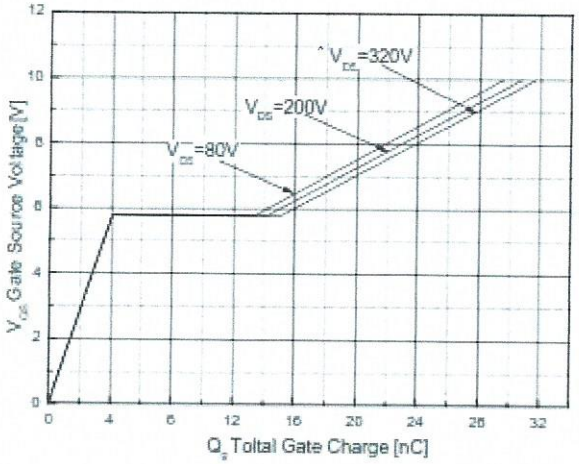
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics

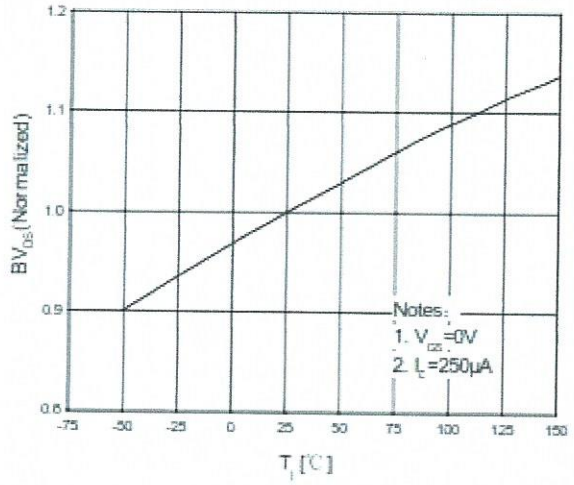


Gate Charge Characteristics

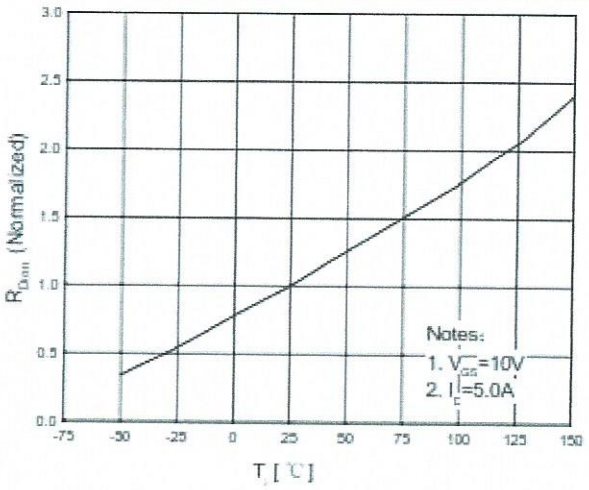


ELECTRICAL CHARACTERISTICS (curves)

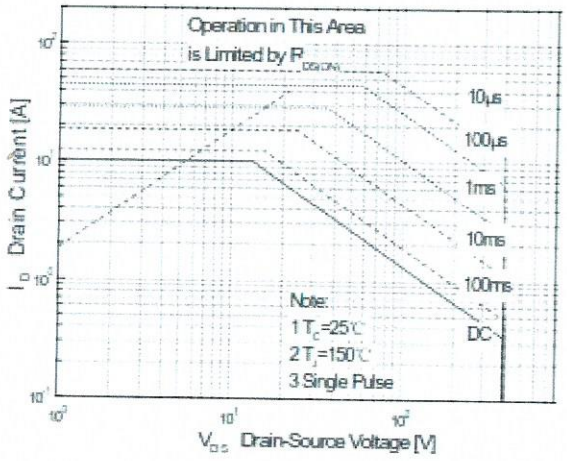
Breakdown Voltage Variation vs. Temperature



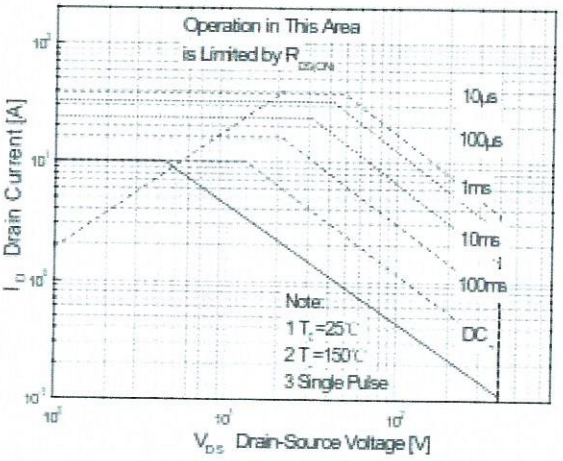
On-Resistance Variation vs. Temperature



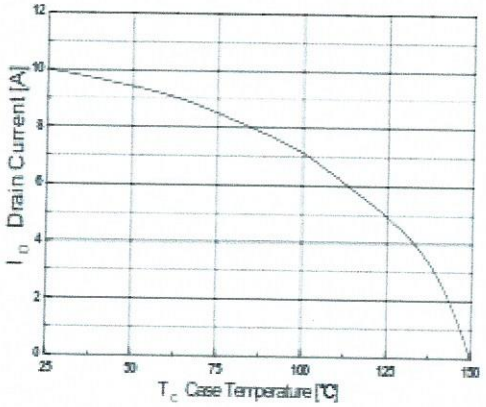
Maximum Safe Operating Area For JCS740S/B/C



Maximum Safe Operating Area For JCS740F

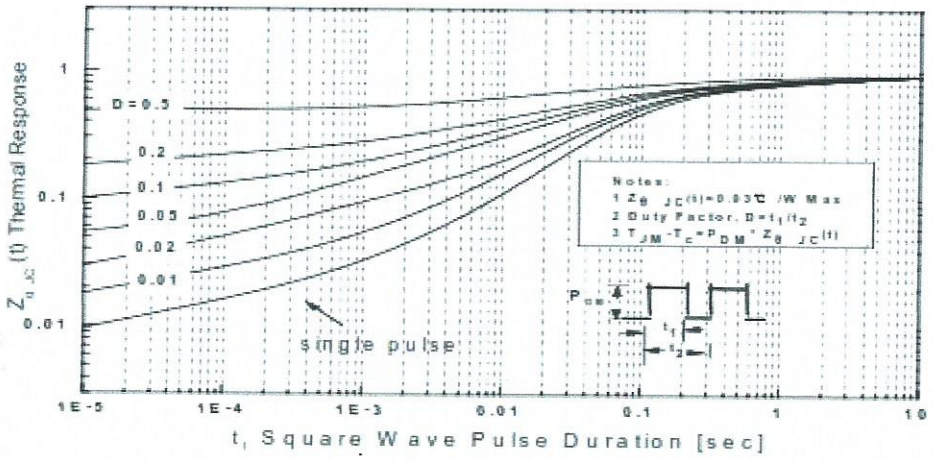


Maximum Drain Current vs. Case Temperature

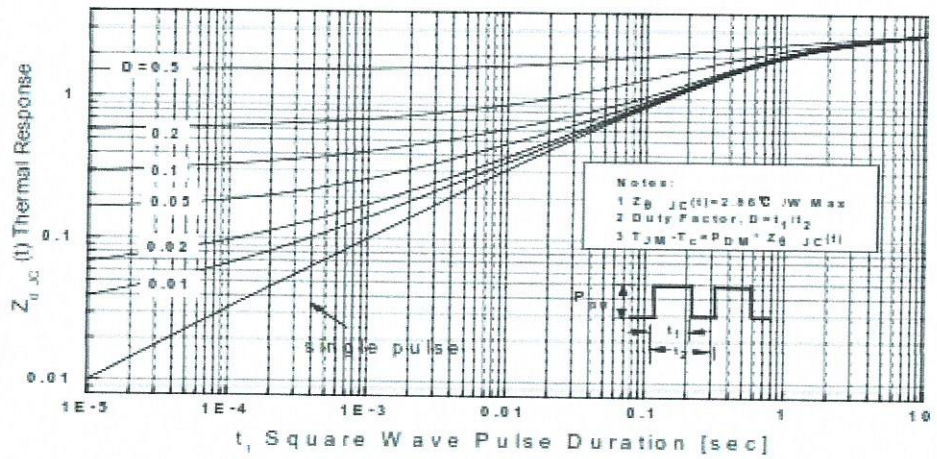


ELECTRICAL CHARACTERISTICS (curves)

Transient Thermal Response Curve For JCS740S/B/C



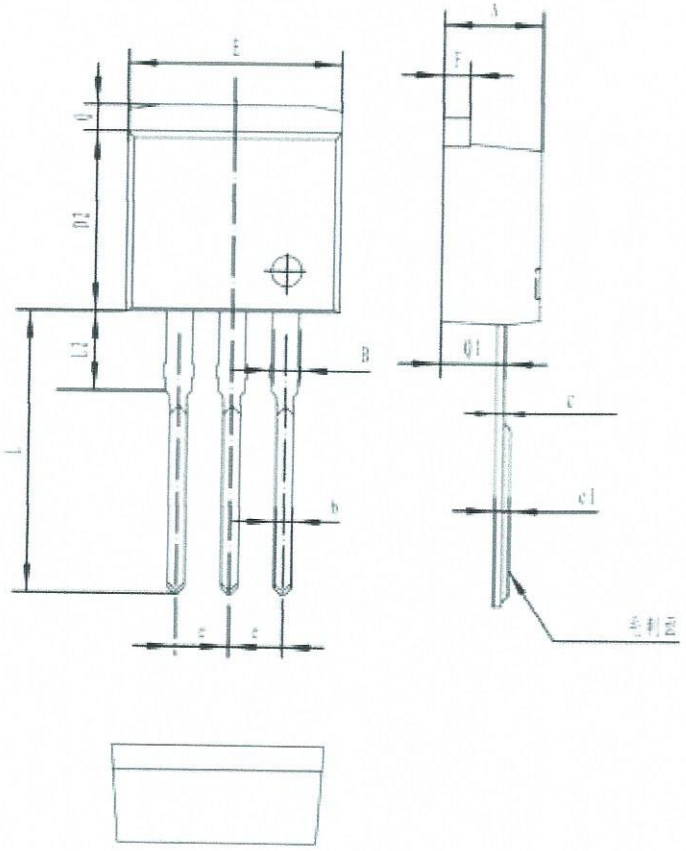
Transient Thermal Response Curve For JCS740F



PACKAGE MECHANICAL DATA

TO-262

Unit: mm

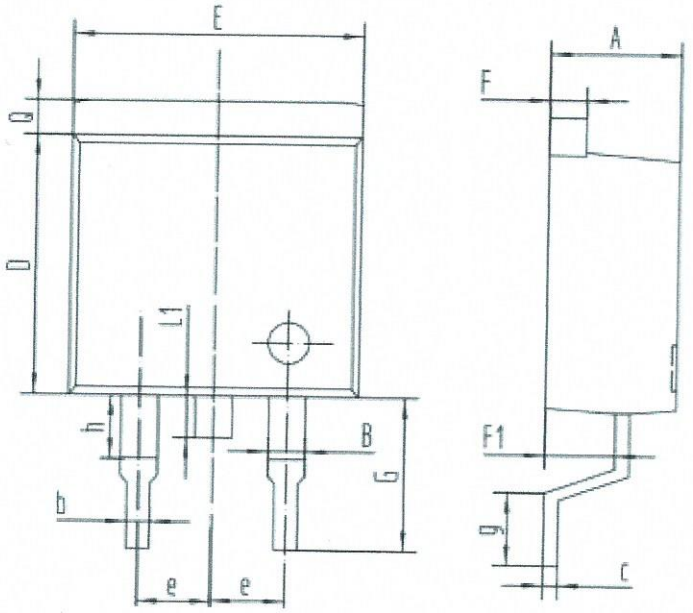


symbol	MIN	MAX
A	4.40	4.90
B	1.10	1.40
b	0.70	0.95
c	0.30	0.60
c1	0.33	0.63
D2	8.20	9.20
E	9.60	10.50
e	2.39	2.69
F	1.20	1.35
L	13.11	14.61
L2	3.55	4.05
Q	1.10	1.40
Q1	2.65	2.85

PACKAGE MECHANICAL DATA

TO-263

Unit: mm

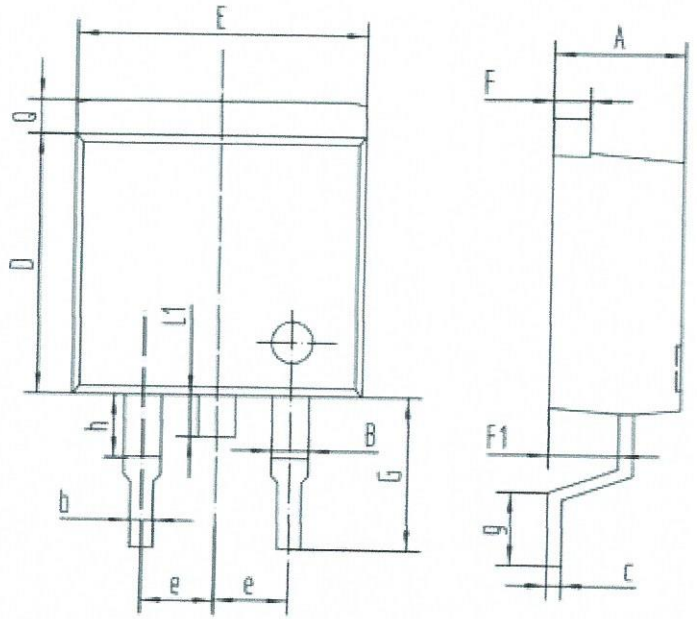


symbol	MIN	MAX
A	4.50	4.90
B	1.20	1.40
D	8.40	8.80
E	9.50	10.50
F	1.20	1.40
F1	2.50	2.90
G	4.50	5.50
L1	1.30	1.60
Q	1.20	1.50
b	0.75	0.95
c	0.35	0.50
e	2.49	2.59
g	1.90	2.80
h	2.30	3.30

PACKAGE MECHANICAL DATA

TO-263

Unit: mm

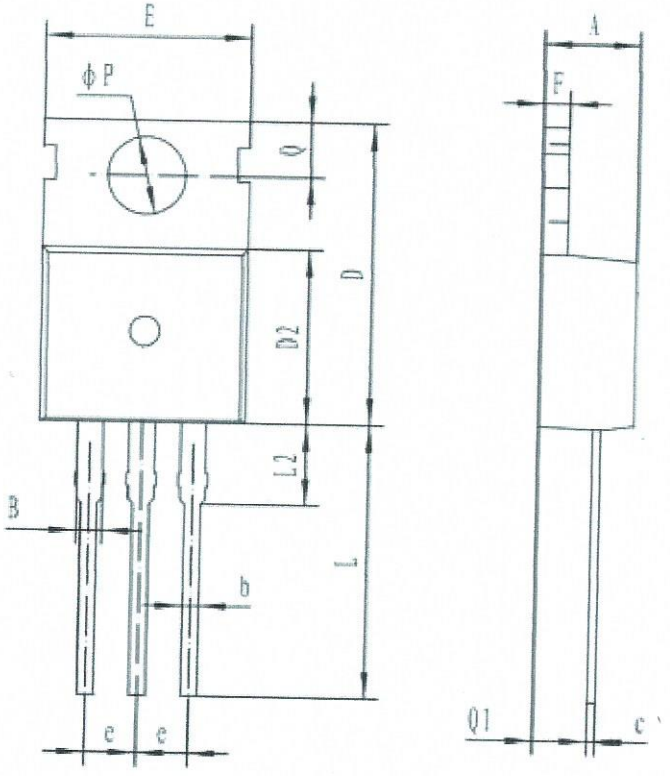


symbol	MIN	MAX
A	4.50	4.90
B	1.20	1.40
D	8.40	8.80
E	9.50	10.50
F	1.20	1.40
F1	2.50	2.90
G	4.50	5.50
L1	1.30	1.60
Q	1.20	1.50
b	0.75	0.95
c	0.35	0.50
e	2.49	2.59
g	1.90	2.80
h	2.30	3.30

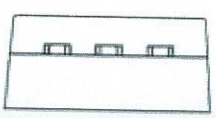
PACKAGE MECHANICAL DATA

TO-220C

Unit: mm



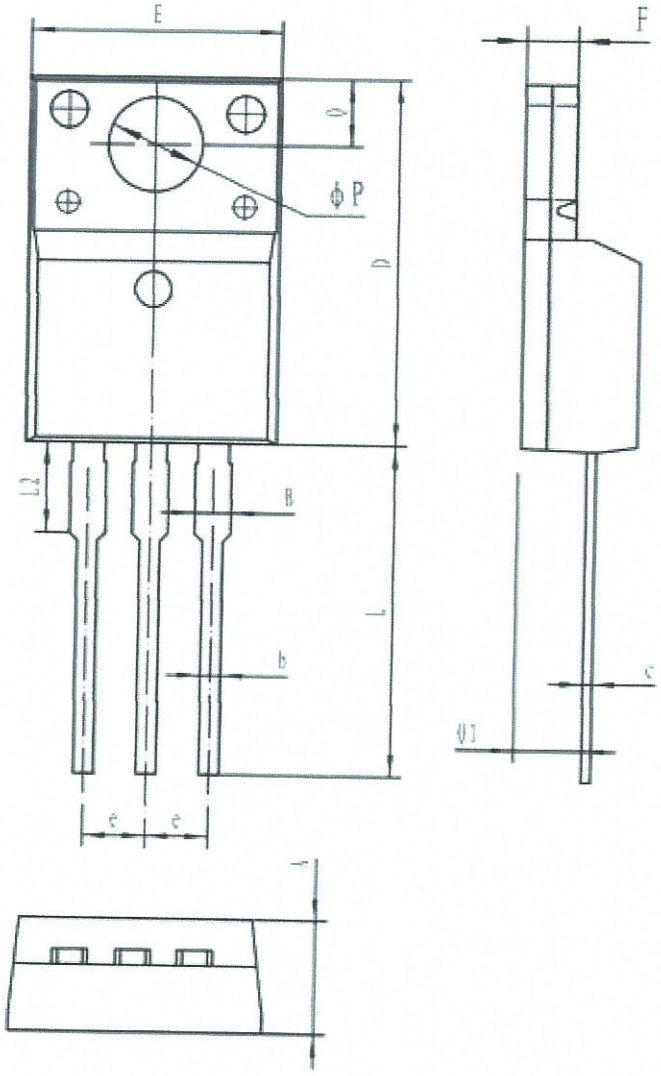
symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.47
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80



PACKAGE MECHANICAL DATA

TO-220MF

Unit: mm



Symbol	MIN	MAX
A	4.5	4.9
B	-	1.47
b	0.7	0.9
c	0.45	0.6
D	15.67	16.07
E	9.96	10.36
e	2.54TYPE	
F	2.34	2.74
L	12.58	13.38
L2	3.13	3.33
ΦP	3.08	3.28
Q	3.2	3.4
Q1	2.56	2.96

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