

MAIN CHARACTERISTICS

I_D	2.0 A
V_{DS}	600 V
$R_{DS(on)}$ @ $V_{GS}=10V$	5 Ω
Q_g	15.3 nC

APPLICATIONS

High frequency switching
mode power supply
Electronic ballast
UPS

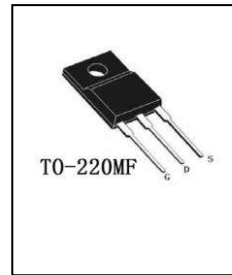
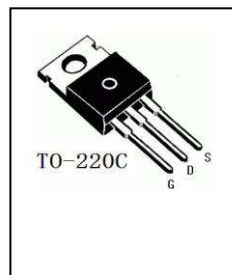
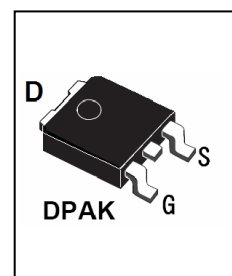
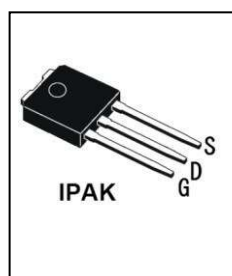
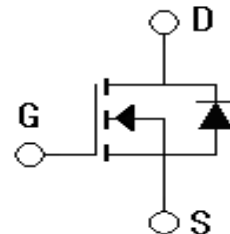
UPS

FEATURES

C_{RSS} (7.6pF) Low gate charge
Low C_{RSS} (typical 7.6pF)
Fast switching
100% avalanche tested
Improved dv/dt capability
RoHS product

dv/dt
RoHS

Package



ORDER MESSAGE

Order codes	Marking	Package	Halogen Free	Packaging	Device Weight
JCS2N60V-O-V-N-B	JCS2N60V	IPAK	NO	Tube	0.35 g(typ)
JCS2N60R-O-R-N-B	JCS2N60R	DPAK	NO	Tube	0.30 g(typ)
JCS2N60C-O-C-N-B	JCS2N60C	TO-220C	NO	Tube	2.15 g(typ)
JCS2N60F-O-F-N-B	JCS2N60F	TO-220MF	NO	Tube	2.20 g(typ)
JCS2N60V-R-V-N-B	JCS2N60V	IPAK	YES	Tube	0.35 g(typ)

ABSOLUTE RATINGS (Tc=25)

Parameter	Symbol	Value			Unit
		JCS2N60V/R	JCS2N60C	JCS2N60F	
Drain-Source Voltage	V_{DSS}	600			V
Drain Current-continuous	I_D T=25	1.9	2.0	2.0*	A
	T=100	1.1	1.3	1.3*	A
¹ Drain Current – pulse note 1	I_{DM}	6.0		6.0*	A
Gate-Source Voltage	V_{GSS}	± 30			V
² Single Pulsed Avalanche Energy note 2	E_{AS}	120			mJ
¹ Avalanche Current(note 1)	I_{AR}	2.0			A
¹ Repetitive Avalanche Energy note 1	E_{AR}	5.4			mJ
³ Peak Diode Recovery Dv/dt note 3	dv/dt	5.5			V/ns
Power Dissipation	P_D T _C =25 -Derate above 25	44	54	23	W
		0.35	0.43	0.18	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}	$I_D=250\mu A, V_{GS}=0V$	600	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=1mA$, referenced to 25	-	0.65	-	V/
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_C=25$	-	-	10	μA
		$V_{DS}=480V, T_C=125$	-	-	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	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$	-	3.8	5.0	Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=1.0A$ note 4	-	2.05	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	380	490	pF
Output capacitance	C_{oss}		-	35	46	pF
Reverse transfer capacitance	C_{rss}		-	7.6	9.9	pF

ELECTRICAL CHARACTERISTICS

Switching Characteristics							
Turn-On delay time	t _{d(on)}	V _{DD} =300V, I _D =2.0A, R _G =25Ω note 4 5	-	16	40	ns	
Turn-On rise time	t _r		-	50	110	ns	
Turn-Off delay time	t _{d(off)}		-	40	90	ns	
Turn-Off Fall time	t _f		-	40	90	ns	
Total Gate Charge	Q _g	V _{DS} =480V , I _D =2.0A V _{GS} =10V note 4 5	-	15.3	19	nC	
Gate-Source charge	Q _{gs}		-	1.8	-	nC	
Gate-Drain charge	Q _{gd}		-	7.2	-	nC	
Drain-Source Diode Characteristics and Maximum Ratings							
Maximum Continuous Drain -Source Diode Forward Current	I _S		-	-	2.0	A	
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		-	-	6.0	A	
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =2.0A	-	-	1.4	V	
Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =2.0A dI _F /dt=100A/μs (note 4)	-	250	-	ns	
Reverse recovery charge	Q _{rr}		-	1.31	-	μC	

THERMAL CHARACTERISTIC

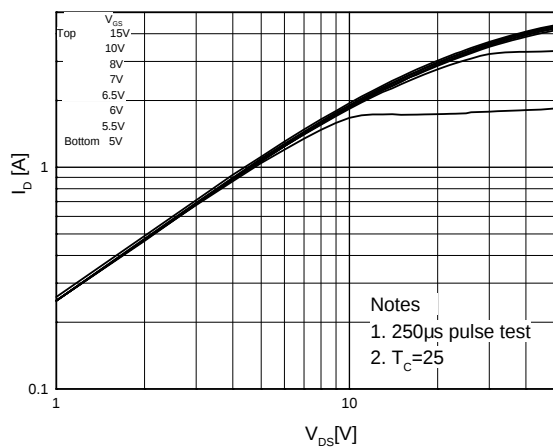
Parameter	Symbol	Max			Unit
		JCS2N60V/R	JCS2N60C	JCS2N60F	
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	2.87	2.32	5.50	$^{\circ}W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	110	62.5	62.5	$^{\circ}W$

Notes:

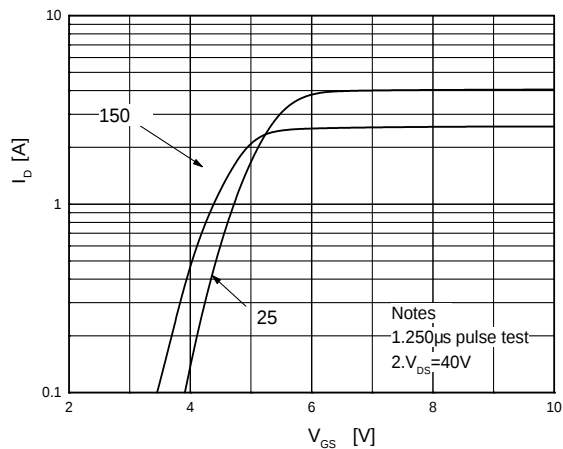
- 1
- 2 $L=55mH$, $I_{AS}=2.0A$, $V_{DD}=50V$, $R_G=25\Omega$,
 $T_J=25$
- 3 $I_{SD} \leq 2A$, $di/dt \leq 300A/\mu s$, $V_{DD} \leq BV_{DSS}$,
 $T_J=25$
- 4 $\leq 300\mu s$, ≤ 2
- 5
- 1 Pulse width limited by maximum junction temperature
- 2 $L=55mH$, $I_{AS}=2.0A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25$
- 3 $I_{SD} \leq 2A$, $di/dt \leq 300A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25$
- 4 Pulse Test Pulse Width $\leq 300\mu s$, Duty Cycle ≤ 2
- 5 Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

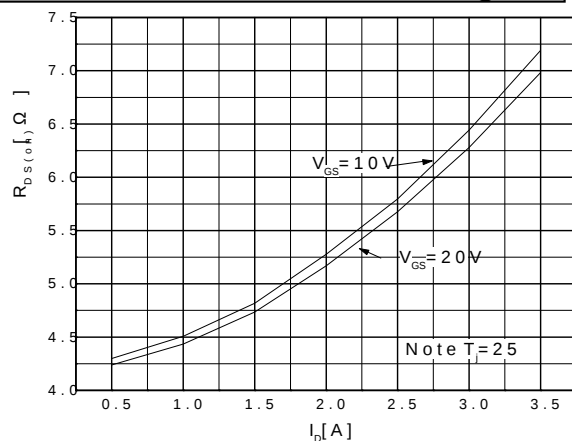
On-Region Characteristics



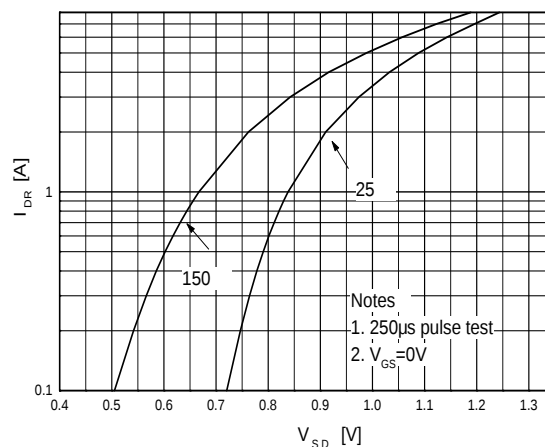
Transfer Characteristics



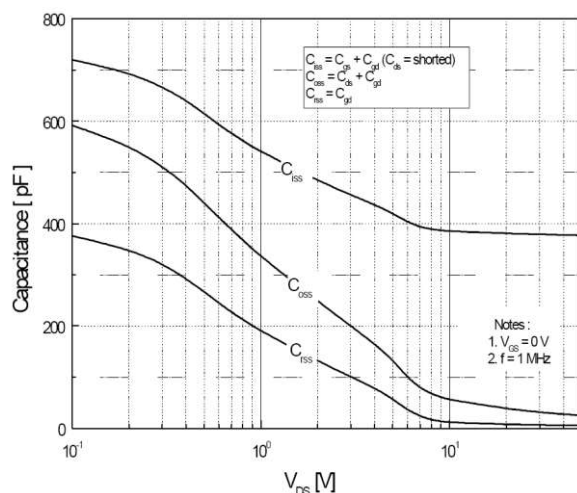
On-Resistance Variation vs. Drain Current and Gate Voltage



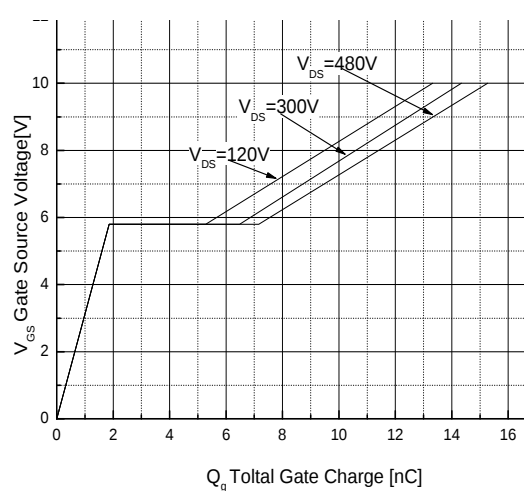
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics

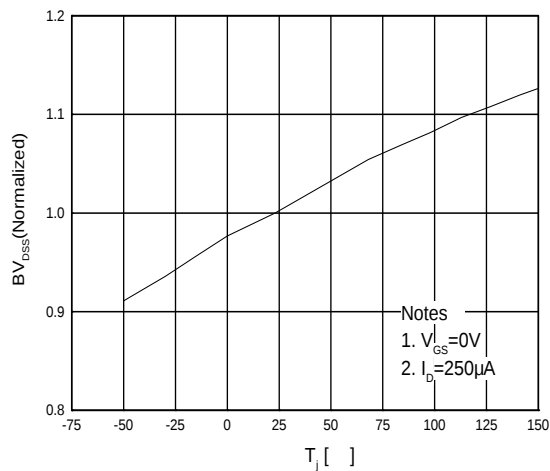


Gate Charge Characteristics

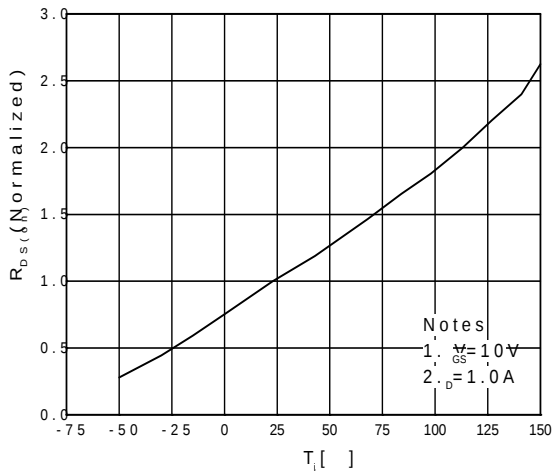


ELECTRICAL CHARACTERISTICS (curves)

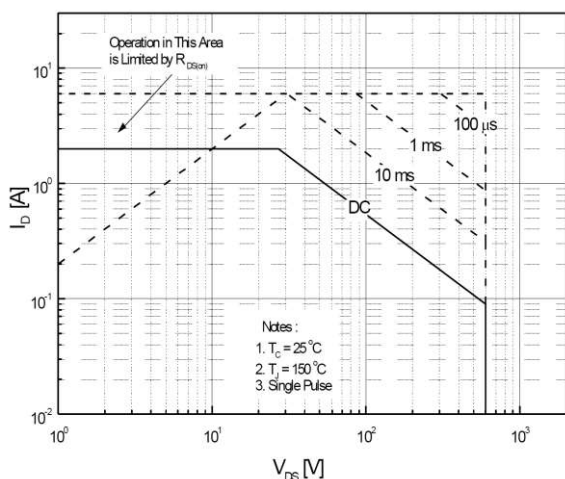
**Breakdown Voltage Variation
vs. Temperature**



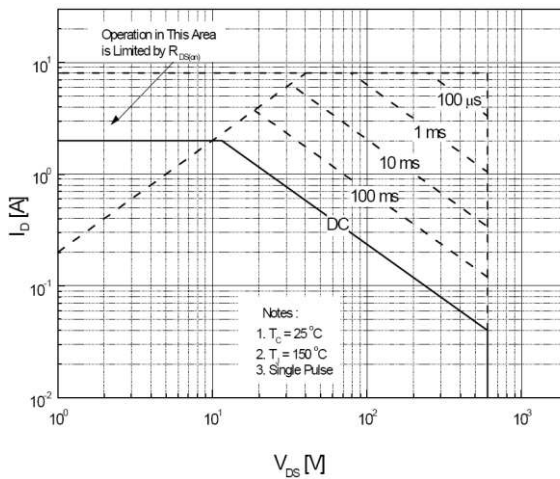
**On-Resistance Variation
vs. Temperature**



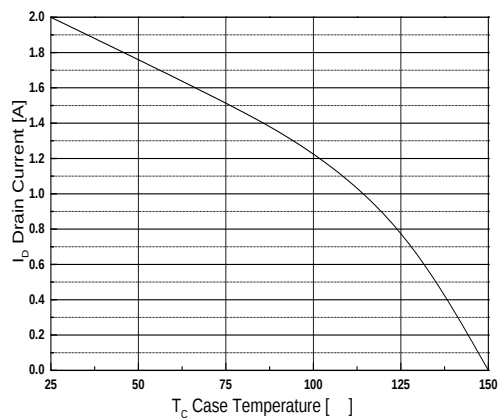
**Maximum Safe Operating Area
For JCS2N60V/R/C**



**Maximum Safe Operating Area
For JCS2N60F**

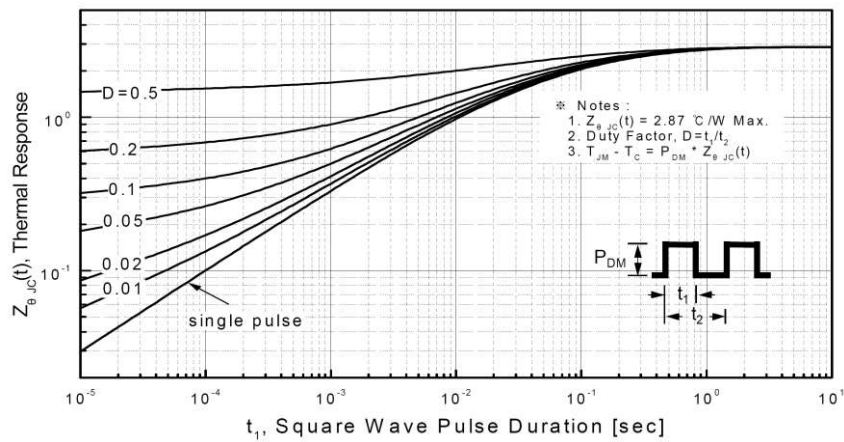


**Maximum Drain Current
vs. Case Temperature**

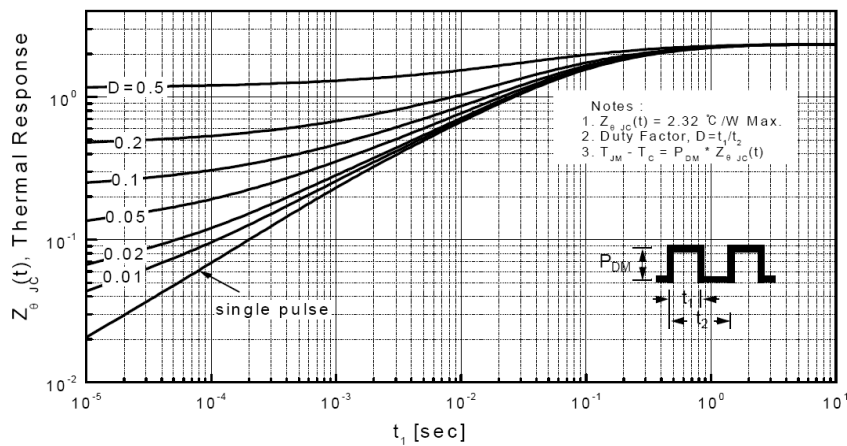


ELECTRICAL CHARACTERISTICS (curves)

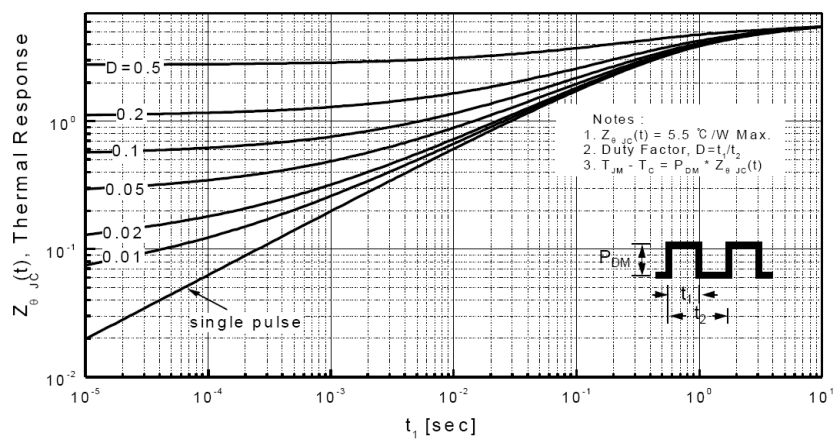
Transient Thermal Response Curve For JCS2N60V/R



Transient Thermal Response Curve For JCS2N60C



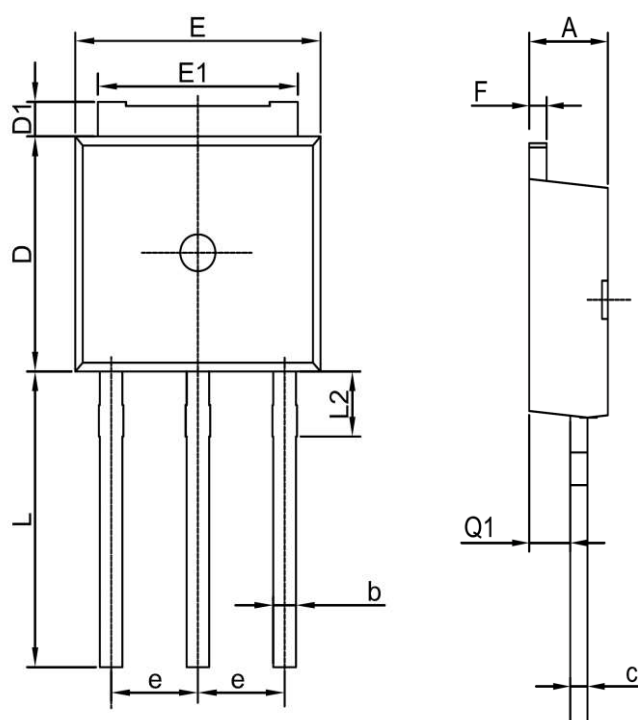
Transient Thermal Response Curve For JCS2N60F



PACKAGE MECHANICAL DATA

IPAK Gh

Unit mm

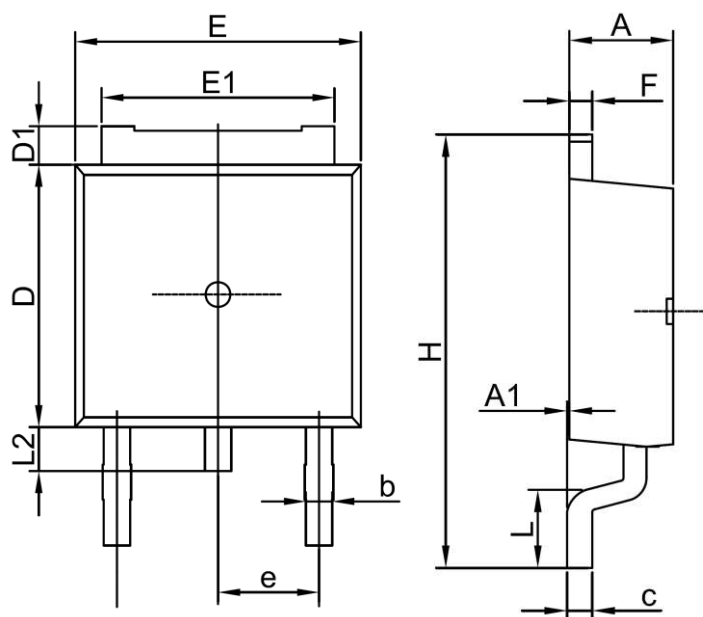


符号 symbol	MIN	MAX
A	2.2	2.4
b	0.7	0.9
c	0.45	0.55
D	6.0	6.3
D1	0.8	1.2
E	6.5	6.8
E1	5.2	5.5
e	2.28TYP	
F	0.45	0.55
L	6.85	7.15
L2	1.8	2.2
Q1	0.8	1.2

PACKAGE MECHANICAL DATA

DPAK Gh

Unit mm

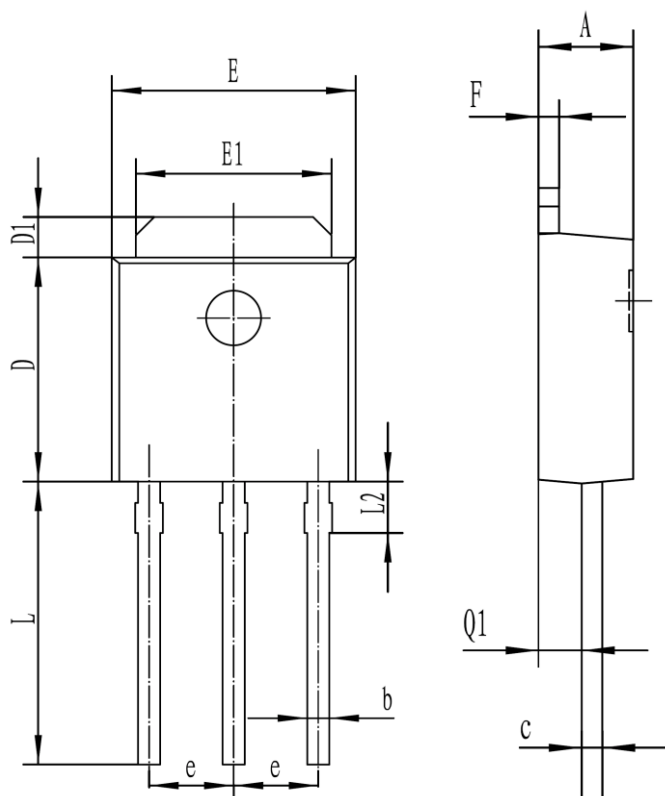


符号 symbol	MIN	MAX
A	2.2	2.4
A1	0.0	0.2
b	0.7	0.9
c	0.45	0.55
D	6.0	6.3
D1	0.8	1.2
E	6.5	6.8
E1	5.2	5.5
e	2.28TYP	
F	0.45	0.55
H	9.65	10.45
L	1.0	1.3
L2	0.7	1.3

PACKAGE MECHANICAL DATA

IPAK **Gf**

Unit **mm**

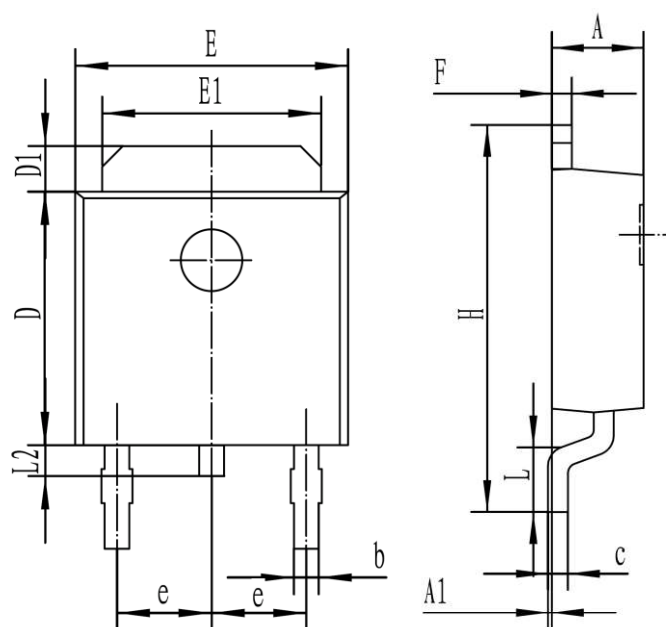


符号 symbol	MIN	MAX
A	2.20	2.40
b	0.60	0.74
c	0.45	0.55
D	5.95	6.25
D1	0.95	1.25
E	6.45	6.75
E1	5.2	5.4
e	2.24	2.34
F	0.45	0.55
L	7.5	7.9
L2	1.0	2.0
Q1	0.95	1.15

PACKAGE MECHANICAL DATA

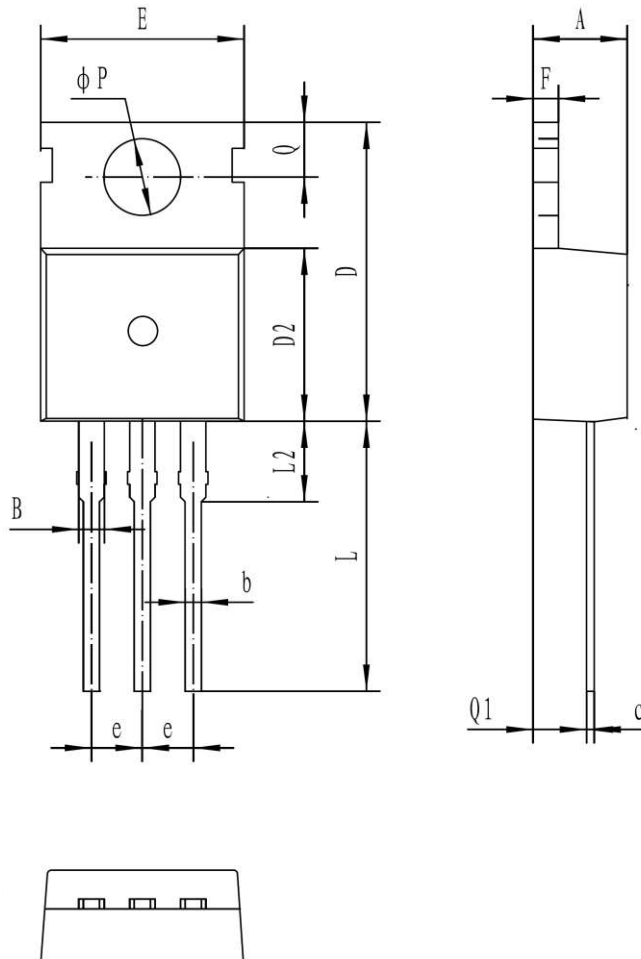
DPAK Gf

Unit mm



符号 symbol	MIN	MAX
A	2.20	2.40
A1	0	0.1
b	0.50	0.70
c	0.45	0.55
D	5.95	6.25
D1	0.95	1.25
E	6.45	6.75
E1	5.2	5.4
e	2.24	2.34
F	0.45	0.55
H	9.45	9.95
L	1.25	1.75
L2	0.6	0.9

PACKAGE MECHANICAL DATA

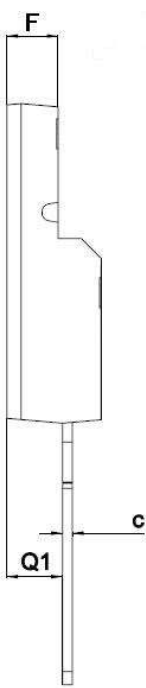
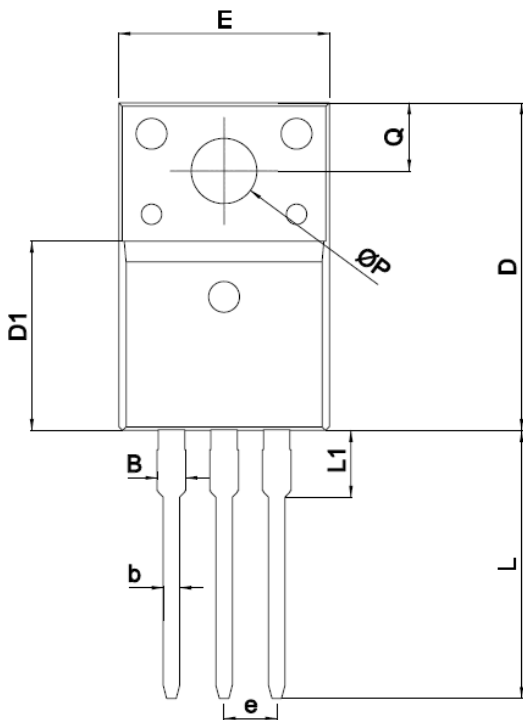
TO-220C
Unit mm


符号 symbol	MIN	MAX
A	4.30	4.70
B	1.10	1.40
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	mm	
	MIN	MAX
A	4.5	4.9
B		1.47
b	0.7	0.9
c	0.45	0.60
D	15.67	16.07
D1	9.04	9.20
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.58	13.38
L1	3.13	3.33
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28

