



JCS7HN60C

主要参数 MAIN CHARACTERISTICS

I_D	7.0 A
V_{DS}	600 V
$R_{DS(on)}$ (@ $V_{GS}=10V$)	1.3 Ω
Q_g -typ	32 nC

用途

- 高频开关电源
- 电子镇流器
- LED 电源

APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- LED power supply

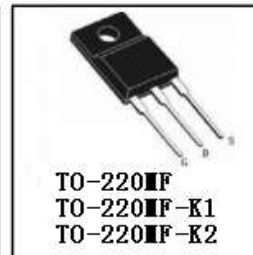
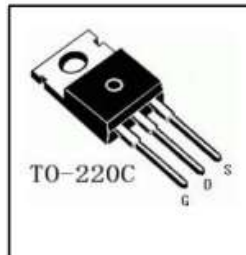
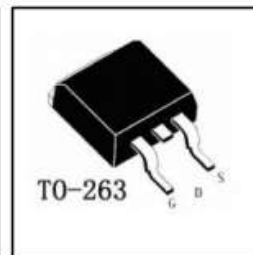
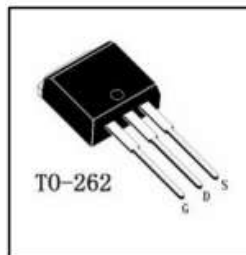
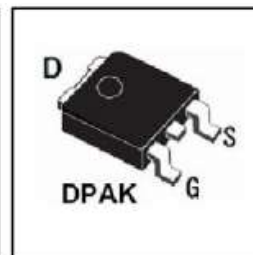
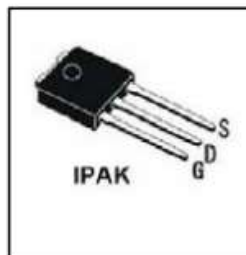
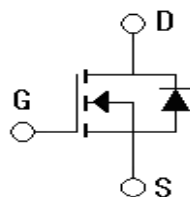
产品特性

- 低栅极电荷
- 低 C_{RSS} (典型值 14pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

FEATURES

- Low gate charge
- Low C_{RSS} (typical 14pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

封装 Package



订货信息 ORDER MESSAGE

订货型号 Order codes	印 记 Marking	封 装 Package	无卤素 Halogen Free	包 装 Packaging	器件重量 Device Weight
JCS7HN60VC-O-V-N-B	JCS7HN60V	IPAK	否 NO	条管 Tube	0.35 g(typ)
JCS7HN60RC-O-R-N-B	JCS7HN60R	DPAK	否 NO	条管 Tube	0.30 g(typ)
JCS7HN60RC-O-R-N-A	JCS7HN60R	DPAK	否 NO	编带 Reel	0.30 g(typ)
JCS7HN60CC-O-C-N-B	JCS7HN60C	TO-220C	否 NO	条管 Tube	2.15 g(typ)
JCS7HN60FC-O-F-N-B	JCS7HN60F	TO-220MF	否 NO	条管 Tube	2.20 g(typ)
JCS7HN60SC-O-F-N-B	JCS7HN60S	TO-263	否 NO	条管 Tube	1.37 g(typ)
JCS7HN60SC-O-F-N-A	JCS7HN60S	TO-263	否 NO	编带 Reel	1.37 g(typ)
JCS7HN60BC-O-F-N-B	JCS7HN60B	TO-262	否 NO	条管 Tube	1.71 g(typ)
JCS7HN60FC-O-F1-N-B	JCS7HN60F	TO-220MF-K1	否 NO	条管 Tube	1.78 g(typ)
JCS7HN60FC-O-F2-N-B	JCS7HN60F	TO-220MF-K2	否 NO	条管 Tube	1.78 g(typ)



绝对最大额定值 ABSOLUTE RATINGS ($T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value			单 位 Unit
		JCS7HN60 CC/SC/BC/VC/RC	JCS7HN6 0FC	JCS7HN60F C-K1/K2	
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSS}	600	600	600	V
连续漏极电流 Drain Current -continuous	I_{D} $T=25^{\circ}\text{C}$ $T=100^{\circ}\text{C}$	7.0	7.0*	7.0*	A
		4.6	4.6*	4.6*	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	I_{DM}	28	28*	28*	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	± 30			V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	420			mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I_{AR}	7.0			A
重复雪崩能量 (注 1) Repetitive Avalanche Energy (note 1)	E_{AR}	12.8			mJ
二极管反向恢复最大电压变化速率 (注 3) Peak Diode Recovery dv/dt (note 3)	dv/dt	4.5			V/ns
耗散功率 Power Dissipation	P_{D} $T_c=25^{\circ}\text{C}$ -Derate above 25°C	120	40	30.2	W
		1.04	0.31	0.24	W/ $^{\circ}\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	$-55 \sim +150$			$^{\circ}\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_{L}	300			$^{\circ}\text{C}$

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature





电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	600	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, referenced to $25^\circ C$	-	0.59	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_C=25^\circ C$	-	-	10	μA
		$V_{DS}=480V, T_C=125^\circ C$	-	-	100	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.5A$	-	1.0	1.3	Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=7.0A$ (note 4)	-	5.6	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	1100	1600	pF
输出电容 Output capacitance	C_{oss}		-	251	300	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	14	20	pF





电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=300V, I_D=7A, R_G=25\Omega$ (note 4, 5)	-	11	31	ns
上升时间 Turn-On rise time	t_r		-	35	80	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	46	95	ns
下降时间 Turn-Off Fall time	t_f		-	40	92	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS} =480V$, $I_D=7A$ $V_{GS} =10V$ (note 4, 5)	-	32	41	nC
栅—源电荷 Gate-Source charge	Q_{gs}		-	6	-	nC
栅—漏电荷 Gate-Drain charge	Q_{gd}		-	15	-	nC
漏—源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings						
正向最大连续电流 Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	7.0	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	28	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=7.0A$	-	-	1.4	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=7.0A$ $di_F/dt=100A/\mu s$ (note 4)	-	345	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	3.2	-	μC

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max			单 位 Unit
		JCS7HN60VC/ RC/CC/SC/BC	JCS7HN60FC TO-220MF	JCS7HN60FC TO-220MF- K1/K2	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	1.04	3.2	4.16	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	62.5	62.5	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $L=29mH, I_{AS}=7.0A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD}\leq 7.0A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

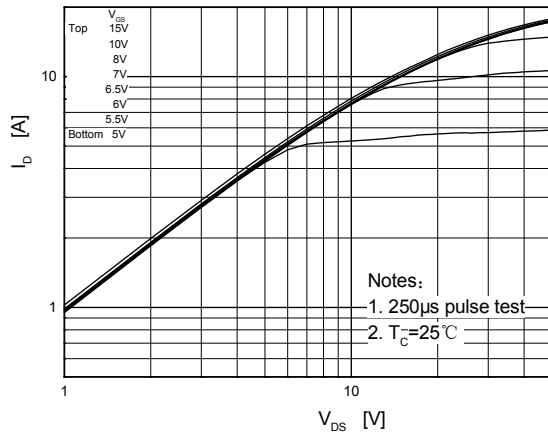
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: $L=29mH, I_{AS}=7.0A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD}\leq 7.0A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 5: Essentially independent of operating temperature

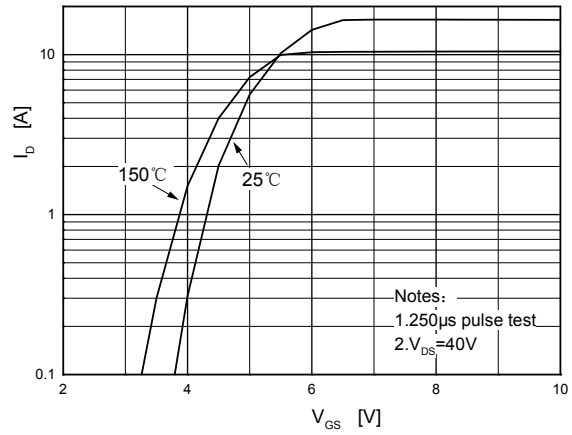


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

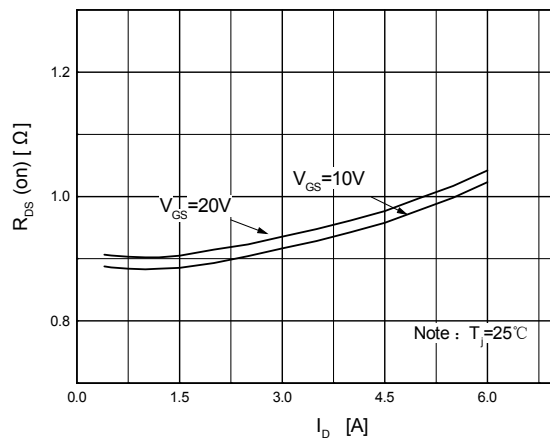
On-Region Characteristics



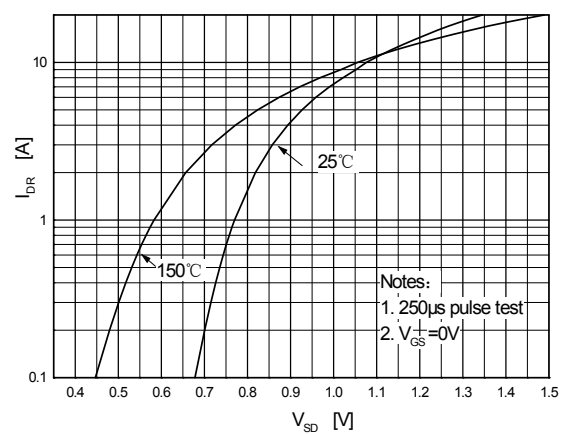
Transfer Characteristics



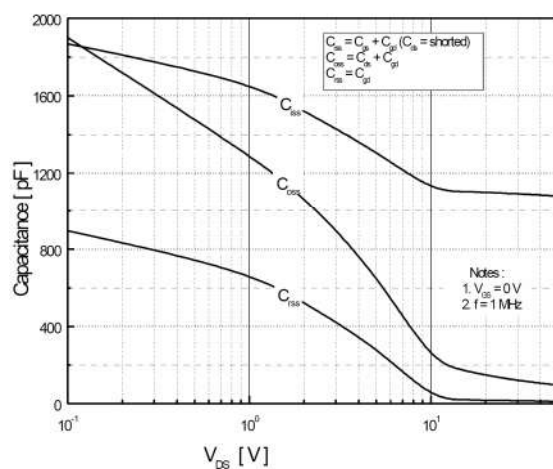
On-Resistance Variation vs. Drain Current and Gate Voltage



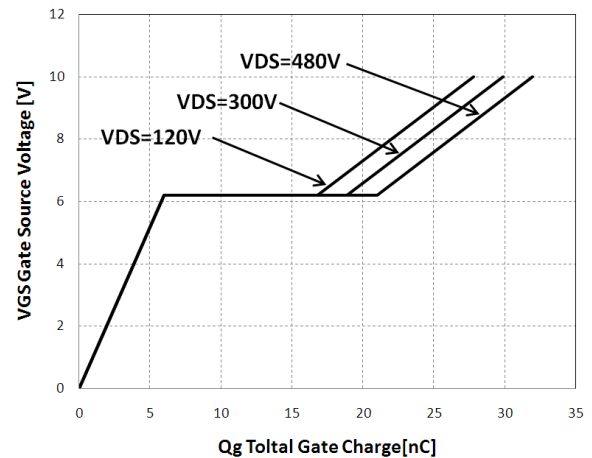
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics

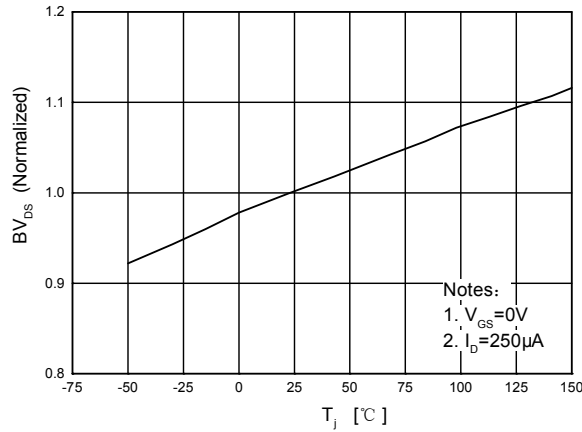


Gate Charge Characteristics

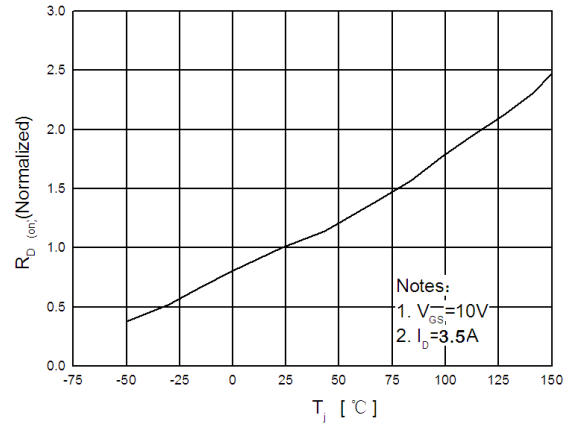


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

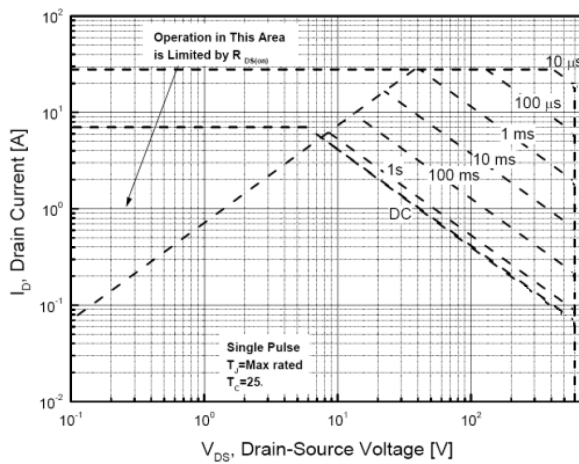
Breakdown Voltage Variation vs. Temperature



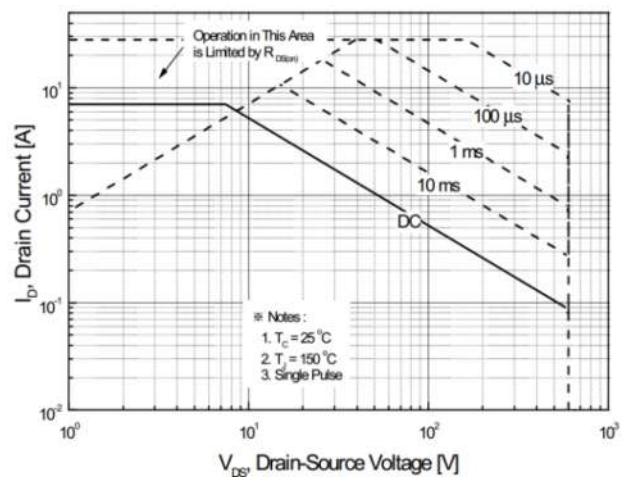
On-Resistance Variation vs. Temperature



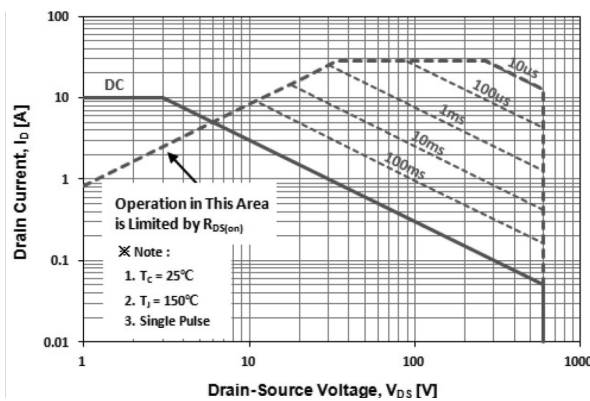
Maximum Safe Operating Area For JCS7HN60CC/SC/BC/RC/VC



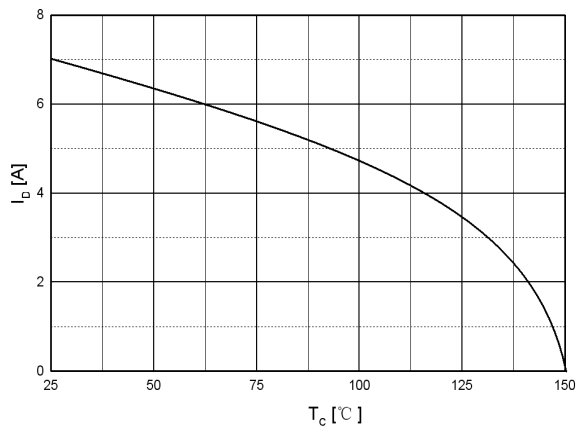
Maximum Safe Operating Area For JCS7HN60FC(TO-220MF)



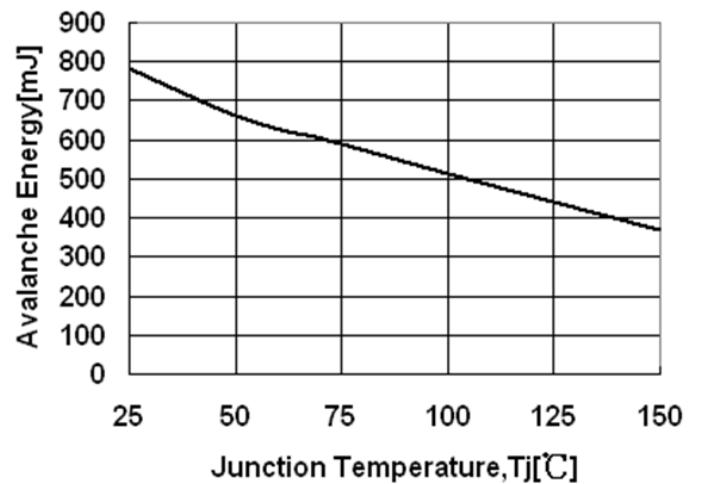
Maximum Safe Operating Area For JCS7HN60FC(TO-220MF-K1/K2)



**Maximum Drain Current
vs. Case Temperature**

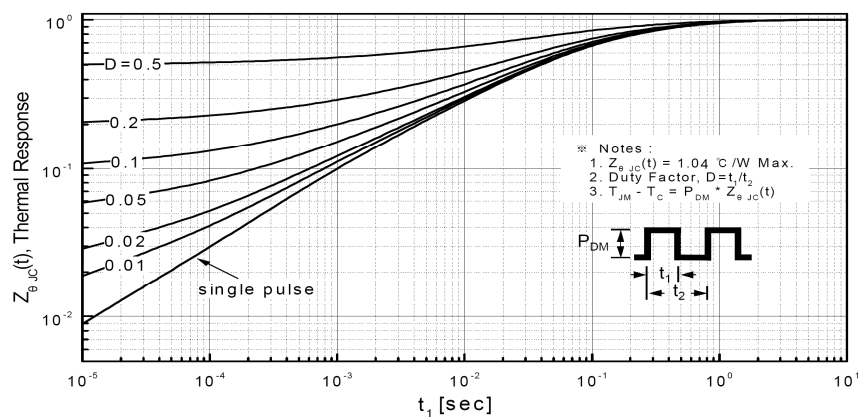


**Avalanche Energy
vs. Temperature**

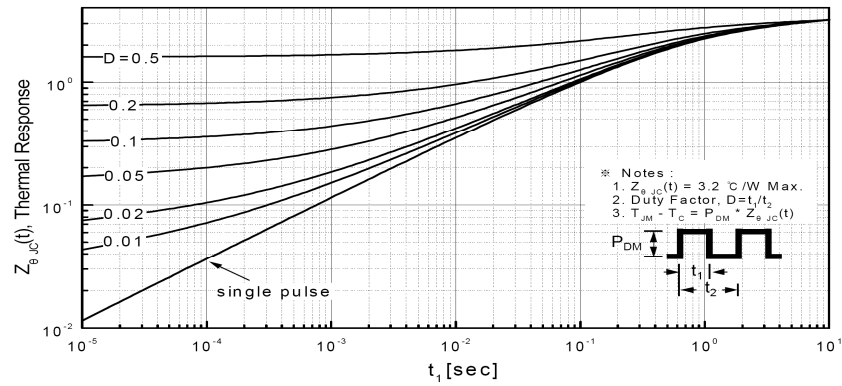


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

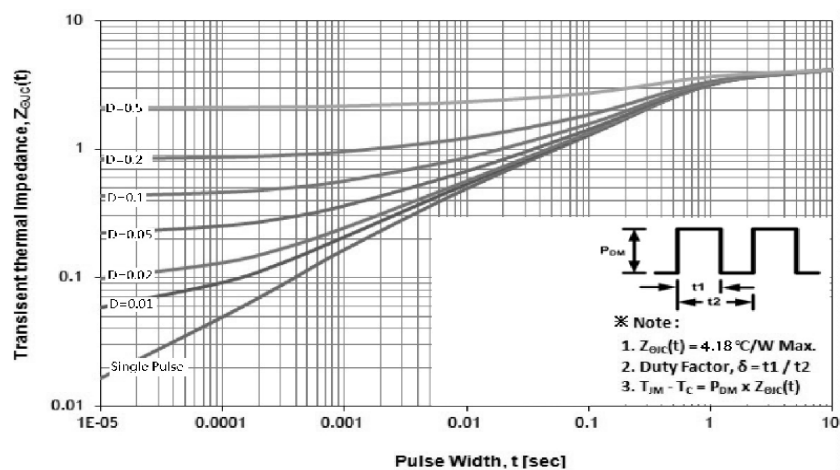
**Transient Thermal Response Curve
For JCS7HN60CB/SB/BB/RC/VC**



Transient Thermal Response Curve For JCS7HN60FC(TO-220MF)



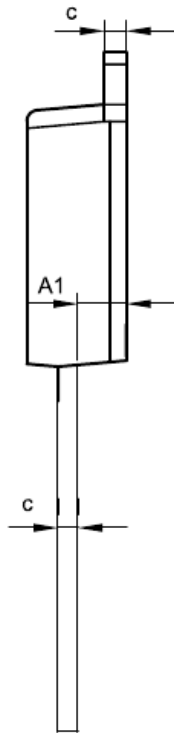
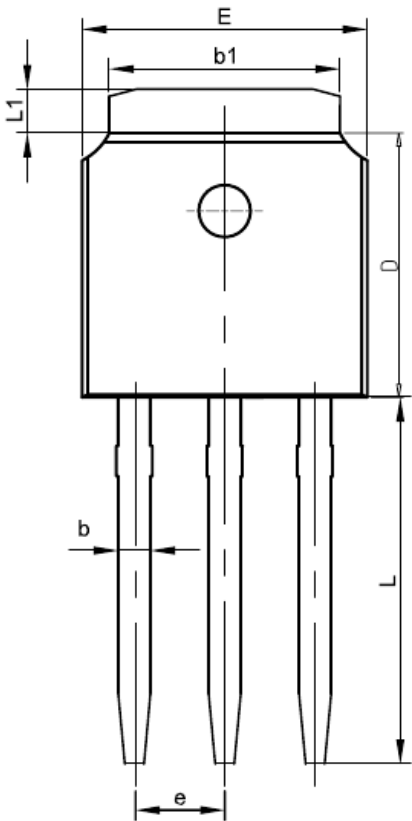
Transient Thermal Response Curve For JCS7HN60FC(TO-220MF-K1/K2)



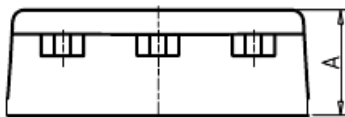


外形尺寸 PACKAGE MECHANICAL DATA
IPAK

单位 Unit: mm



SYMBOL	MM	
	MIN	MAX
A	2.1	2.5
A1	0.87	1.27
b	0.63	0.93
b1	5.13	5.53
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
L	9.10	9.70
e	2.286BSC	
L1	0.82	1.22

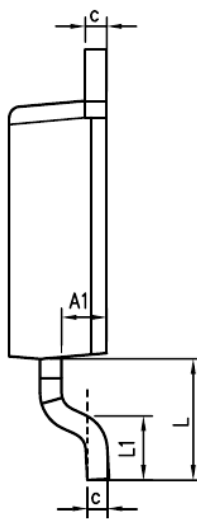
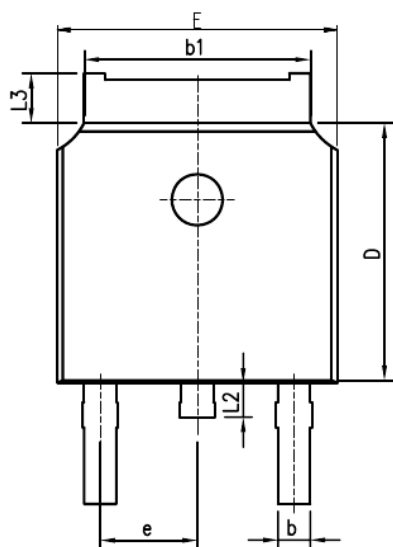




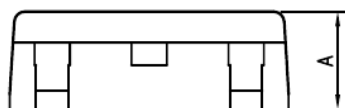
外形尺寸 PACKAGE MECHANICAL DATA

DPAK

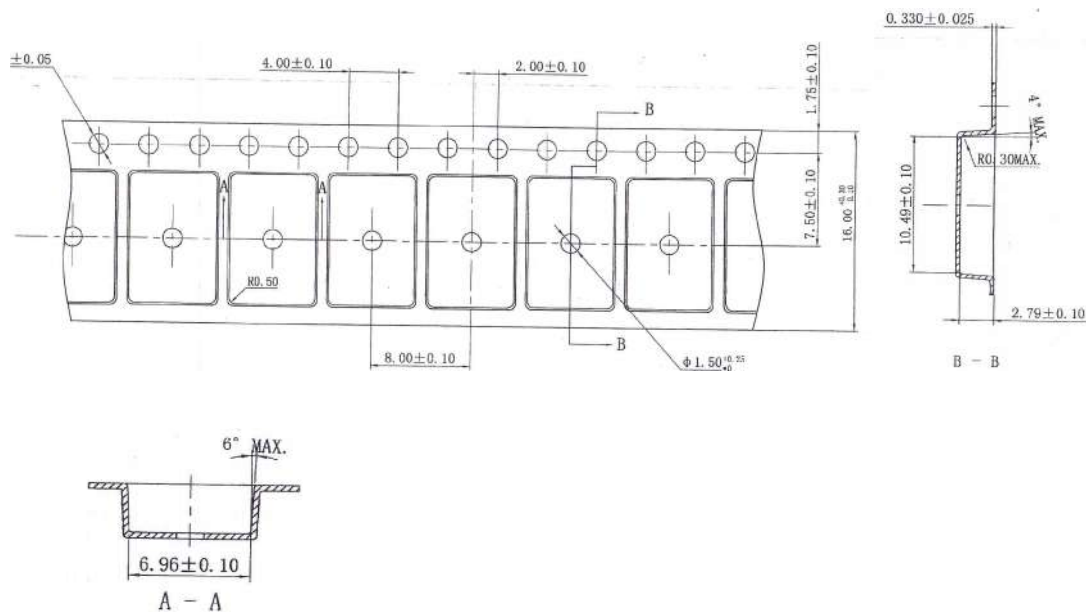
单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	2.10	2.50
A1	0.97	1.17
b	0.63	0.93
b1	5.13	5.53
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30



编带 REEL

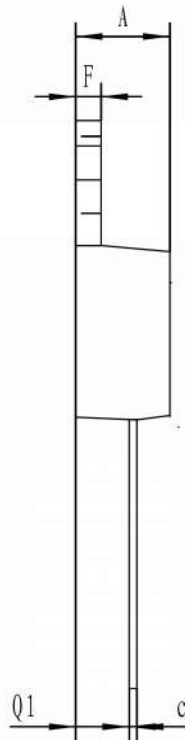
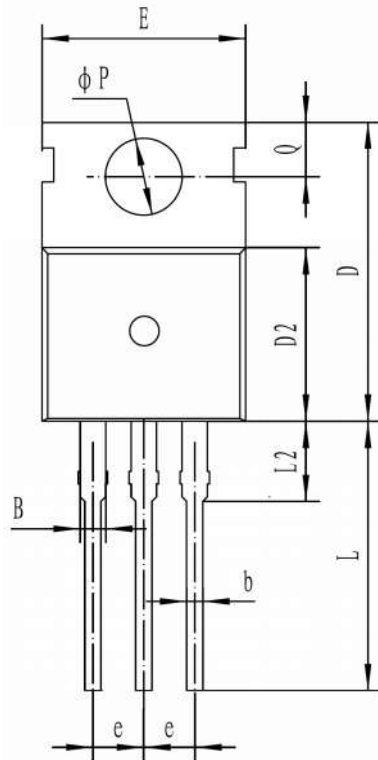




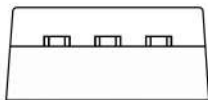
外形尺寸 PACKAGE MECHANICAL DATA

TO-220C

单位 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

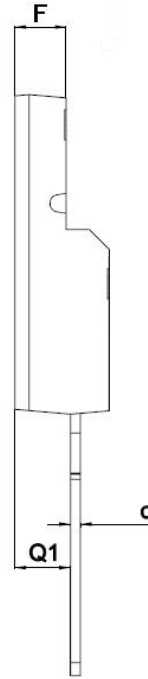
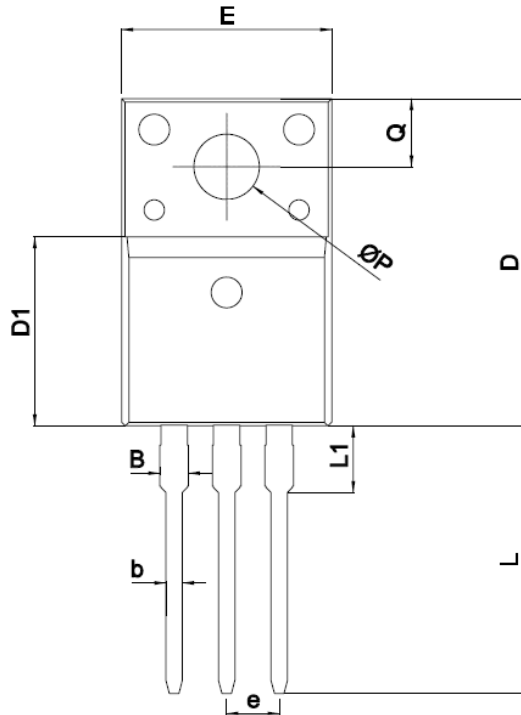




外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF

单位 Unit: mm



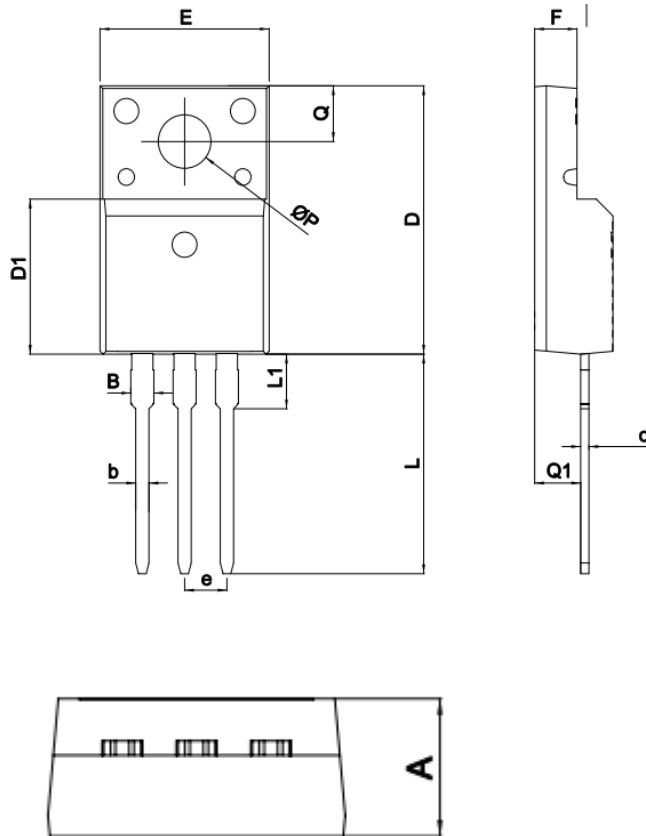
SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.47
b	0.7	0.9
c	0.45	0.60
D	15.67	16.07
D1	9.04	9.20
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.58	13.38
L1	3.13	3.33
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28



外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K1

单位 Unit: mm

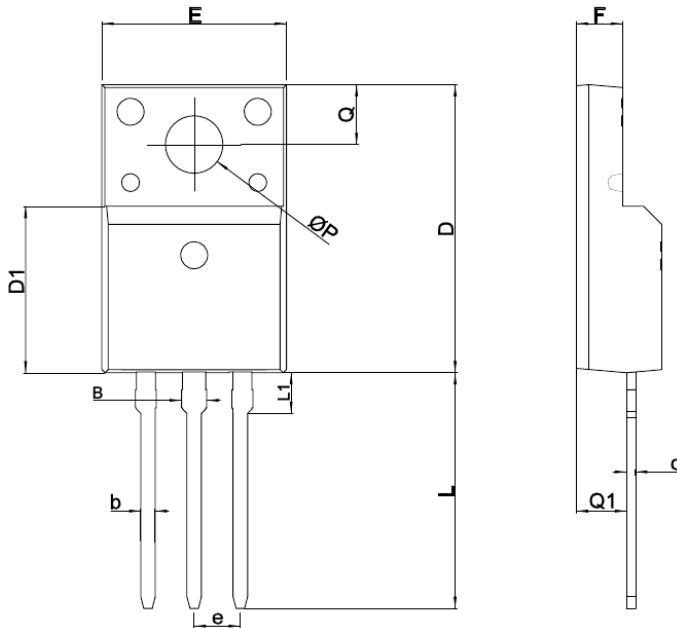


SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B	1.22	1.47
b	0.7	0.9
c	0.45	0.60
D	15.6	16.1
D1	9.0	9.3
e	2.54TYPE	
E	9.9	10.4
F	2.3	2.8
L	12.6	13.3
L1	3.1	3.4
Q	3.2	3.4
Q1	2.6	2.9
ΦP	3.0	3.5

外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K2

单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.27
b	0.59	0.79
c	0.45	0.60
D	15.67	16.07
D1	8.97	9.37
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.65	13.35
L1	1.80	2.20
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28

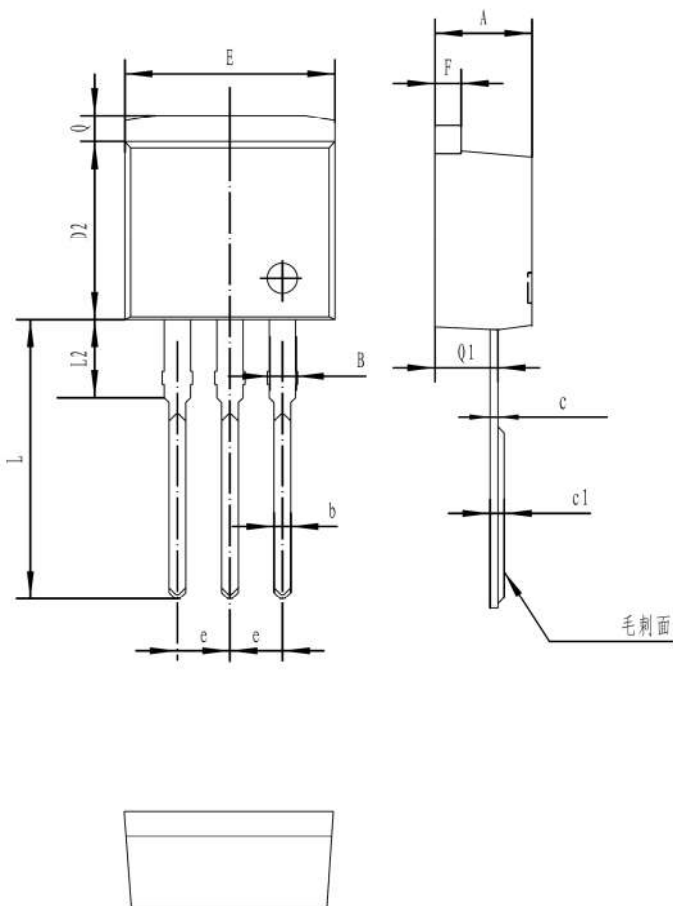




外形尺寸 PACKAGE MECHANICAL DATA

TO-262

单位 Unit: mm



符号 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

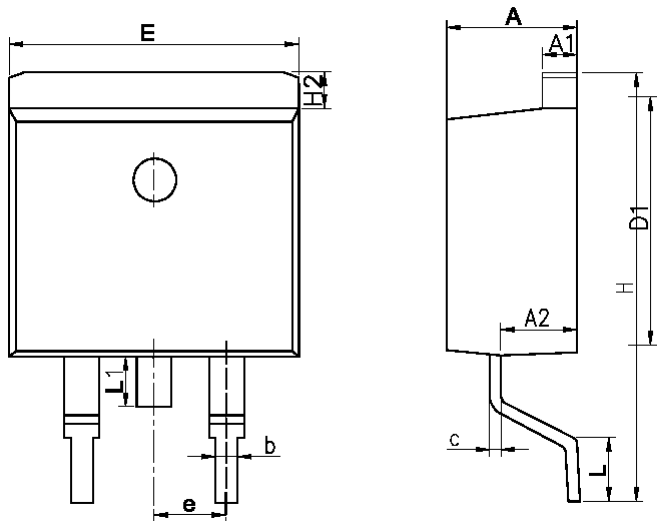




外形尺寸 PACKAGE MECHANICAL DATA

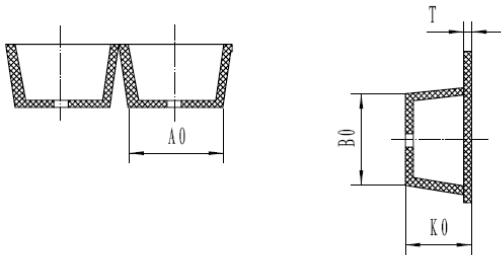
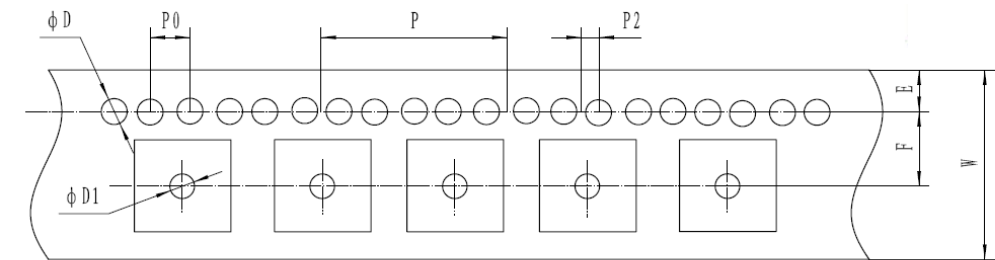
TO-263

单位 Unit: mm



SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70

编带 REEL



产品尺寸规格 (UNIT: mm)				
规格	W	A0	E	F
尺寸	24 ± 0.3	10.9 ± 0.1	1.75 ± 0.1	11.5 ± 0.1
规格	D1	P0	P2	T
尺寸	1.5 ± 0.1/-0	4 ± 0.1	2 ± 0.1	0.35 ± 0.05
规格	K0	B0		
尺寸	4.9 ± 0.1	16.0 ± 0.1		



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联系方式**吉林华微电子股份有限公司**

公司地址：吉林省吉林市深圳街 99 号

邮编：132013

总机：86-432-64678411

传真：86-432-64665812

网址：www.hwdz.com.cn

市场营销部

地址：吉林省吉林市深圳街 99 号

邮编：132013

电话：86-432-64675588

64675688

64678411

传真：86-432-64671533

CONTACT**JILIN SINO-MICROELECTRONICS CO., LTD.**

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64678411

Fax: 86-432-64665812

Web Site: www.hwdz.com.cn

MARKET DEPARTMENT

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64675588

64675688

64678411

Fax: 86-432-64671533

