

PHJCS640H

主要参数 MAIN CHARACTERISTICS

| | |
|-------------------------|--------|
| ID | 18A |
| VDSS | 200 V |
| Rdson-max (@Vgs=10V) | 0.15Ω |
| Qg-typ | 27.5nC |

用途

- 高频开关电源
- 电子镇流器
- UPS 电源

APPLICATIONS

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

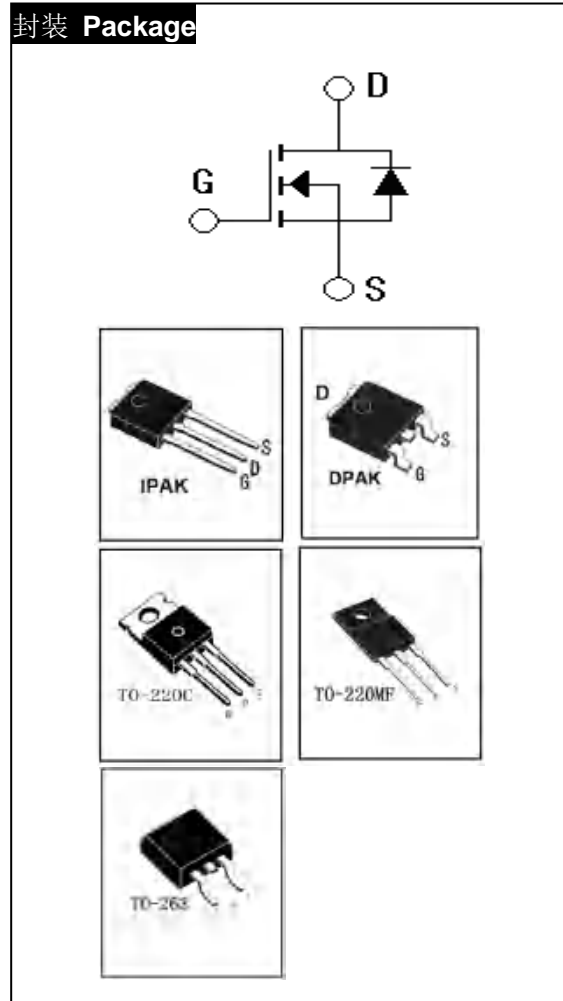
产品特性

- 低栅极电荷
- 低 C_{rss} (典型值 25pF)
- 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 25pF)
- 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 |
|-----------------------|----------------------------|-----------------------|----------------------------|----------------|----------------|
| 有卤-条管 Halogen-Tube | 无卤-条管 Halogen-Free-Tube | 有卤-编带 Halogen-Reel | 无卤-编带 Halogen-Free-Reel | | |
| JCS640VH-V-B | JCS640VH-V-BR | N/A | N/A | JCS640VH | IPAK |
| JCS640RH-R-B | JCS640RH-R-BR | JCS640RH-R-A | JCS640RH-R-AR | JCS640RH | DPAK |
| JCS640CH-C-B | JCS640CH-C-BR | N/A | N/A | JCS640CH | TO-220C |
| JCS640FH-F-B | JCS640FH-F-BR | N/A | N/A | JCS640FH | TO-220MF |
| JCS640SH-S-B | JCS640SH-S-BR | JCS640SH-S-A | JCS640SH-S-AR | JCS640SH | TO-263 |

绝对最大额定值 ABSOLUTE RATINGS (T_c=25°C)

| 项 目 Parameter | 符 号 Symbol | 数 值 Value | | 单 位 Unit |
|---|--|-------------------|----------|-------------|
| | | JCS640VH/RH/CH/SH | JCS640FH | |
| 最高漏极-源极直流电压 Drain-Source Voltage | V _{DSS} | 200 | | V |
| 连续漏极电流 Drain Current -continuous | I _D T=25°C T=100°C | 18 | 18* | A |
| | | 16 | 16* | A |
| 最大脉冲漏极电流 (注 1) Drain Current -pulse (note 1) | I _{DM} | 72 | 72* | 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} | 259 | | mJ |
| 雪崩电流 (注 1) Avalanche Current (note 1) | I _{AR} | 18 | | A |
| 重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1) | E _{AR} | 14 | 4.4 | 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 | 5.5 | | V/ns |
| 耗散功率 Power Dissipation | P _D T _C =25°C -Derate above 25°C | 140 | 44 | W |
| | | 1.12 | 0.35 | W/°C |
| 最高结温及存储温度 Operating and Storage Temperature Range | T _J , T _{STG} | -55~+150 | | °C |
| 引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes | T _L | 300 | | °C |

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature

电特性 ELECTRICAL CHARACTERISTIC

| 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} | $I_D=250\mu A, V_{GS}=0V$ | 200 | - | - | 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°C | - | 0.2 | - | V/°C |
| 零栅压下漏极漏电流 Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=200V, V_{GS}=0V, T_C=25^\circ C$ | - | - | 1 | μA |
| | | $V_{DS}=160V, T_C=125^\circ C$ | - | - | 10 | 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 | $R_{DS(on)}$ | $V_{GS} = 10V, I_D=9A$ | 0.08 | 0.12 | 0.15 | Ω |
| 正向跨导 Forward Transconductance | g_{fs} | $V_{DS} = 40V, I_D=9A$ (note 4) | - | 14.5 | - | S |
| 动态特性 Dynamic Characteristics | | | | | | |
| 栅电阻 Gate resistance | R_g | V_{DS} Open, $f=1.0MHz$ | 0.5 | 1.5 | 2.5 | Ω |
| 输入电容 Input capacitance | C_{iss} | $V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$ | 350 | 1001 | 1650 | pF |
| 输出电容 Output capacitance | C_{oss} | | 104 | 173 | 300 | pF |
| 反向传输电容 Reverse transfer capacitance | C_{rss} | | 15 | 25 | 40 | pF |

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 |
|--|---------------|---|-----------|-----------|-----------|-------------|
| 开关特性 Switching –Characteristics | | | | | | |
| 延迟时间 Turn-On delay time | $t_{d(on)}$ | $V_{DD}=100V, I_D=18A, R_G=25\Omega$ $V_{GS}=10V$ (note 4, 5) | 9 | 15.2 | 21 | ns |
| 上升时间 Turn-On rise time | t_r | | 16.5 | 38.7 | 60 | ns |
| 延迟时间 Turn-Off delay time | $t_{d(off)}$ | | 21.5 | 46.4 | 71.5 | ns |
| 下降时间 Turn-Off Fall time | t_f | | 6.8 | 12.8 | 18.8 | ns |
| 栅极电荷总量 Total Gate Charge | Q_g | $V_{DS}=160V,$ $I_D=18A$ $V_{GS}=10V$ (note 4, 5) | 12 | 27.5 | 42 | nC |
| 栅—源电荷 Gate-Source charge | Q_{gs} | | 2.5 | 5.7 | 8.9 | nC |
| 栅—漏电荷 Gate-Drain charge | Q_{gd} | | 5.8 | 10.8 | 15.8 | 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 | - | - | 18 | A |
| 正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current | | I_{SM} | - | - | 72 | A |
| 正向最大连续电流 Maximum Continuous Drain-Source Diode Forward Current | V_{SD} | $V_{GS}=0V, I_S=18A$ | - | | 1.4 | V |
| 反向恢复时间 Reverse recovery time | t_{rr} | $V_{GS}=0V, I_S=18A$ $di_F/dt=100A/\mu s$ (note 4) | 124 | 224 | 324 | ns |
| 反向恢复电荷 Reverse recovery charge | Q_{rr} | | 0.58 | 1.38 | 2.18 | μC |

热特性 THERMAL CHARACTERISTIC

| 项 目 Parameter | 符 号 Symbol | 最大值 Value | | 单 位 Unit |
|--|---------------|-------------------|----------|---------------|
| | | JCS640VH/RH/CH/SH | JCS640FH | |
| 结到管壳的热阻 Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | 0.89 | 2.85 | $^{\circ}C/W$ |
| 结到环境的热阻 Thermal Resistance, Junction to Ambient | $R_{th(j-A)}$ | 62.5 | | $^{\circ}C/W$ |

注:

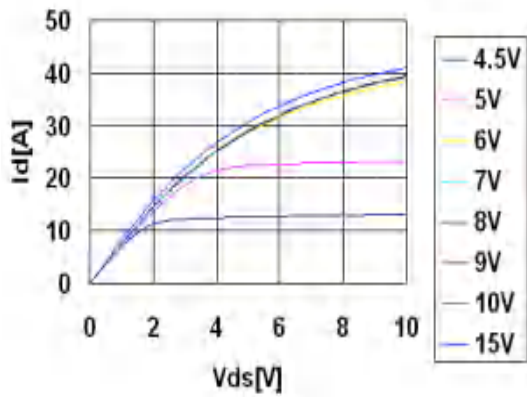
- 1: 脉冲宽度由最高结温限制
- 2: $L=1.6mH, I_{AS}=18A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 18A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

Notes:

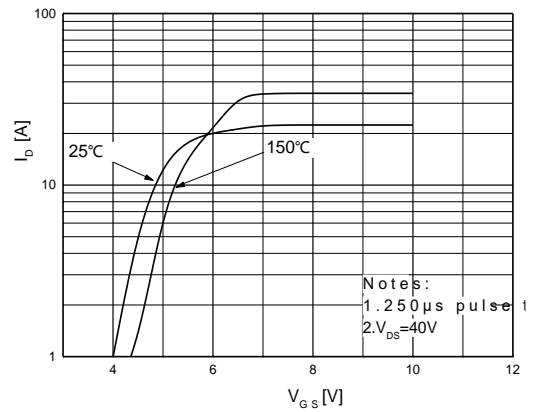
- 1: Pulse width limited by maximum junction temperature
- 2: $L=1.6mH, I_{AS}=18A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 18A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

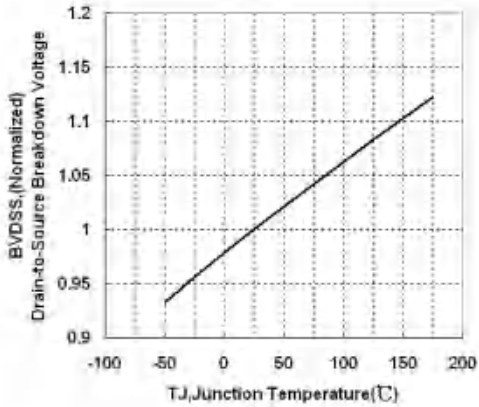
Typical Output Characteristics, TC = 25 °C



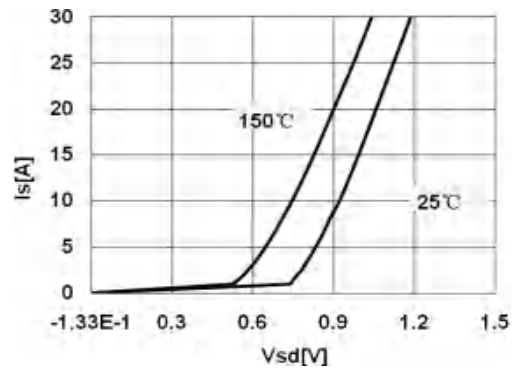
Transfer Characteristics



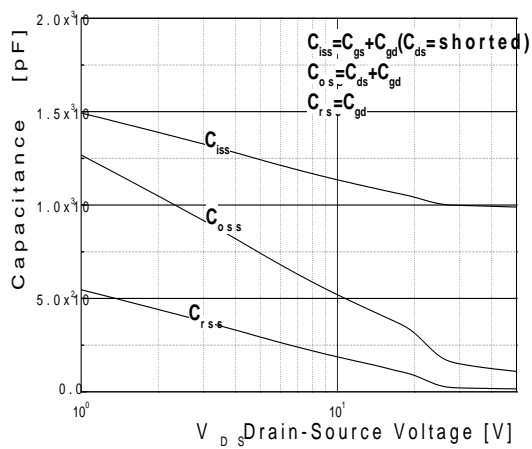
Breakdown Voltage Variation vs. Temperature



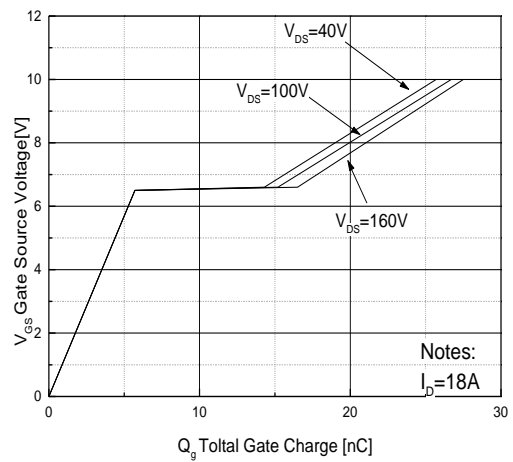
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics

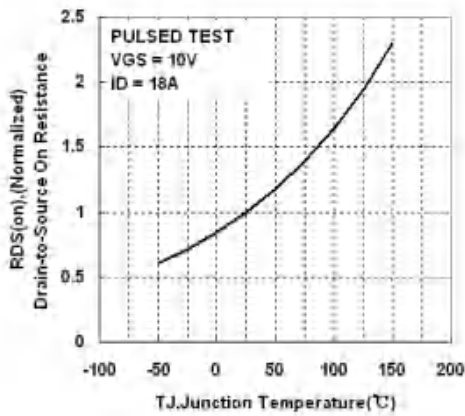


Gate Charge Characteristics

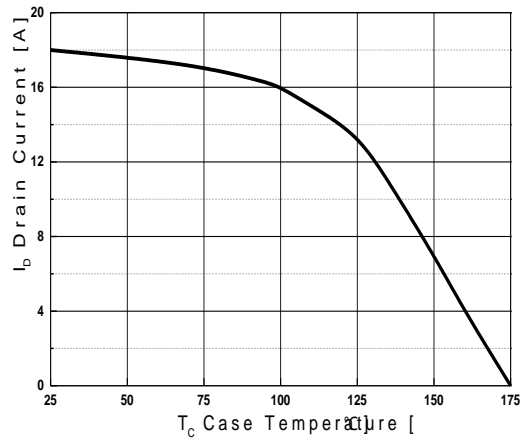


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

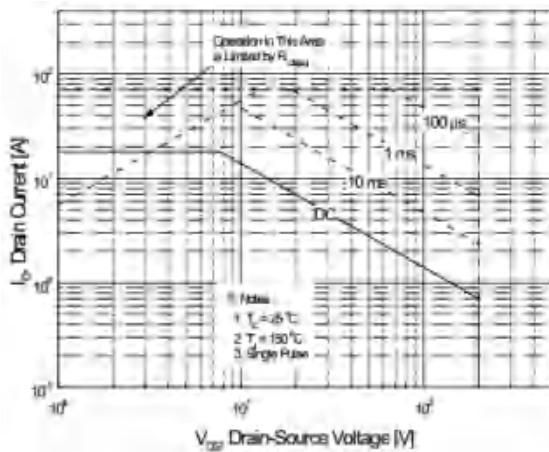
On-Resistance Variation vs. Temperature



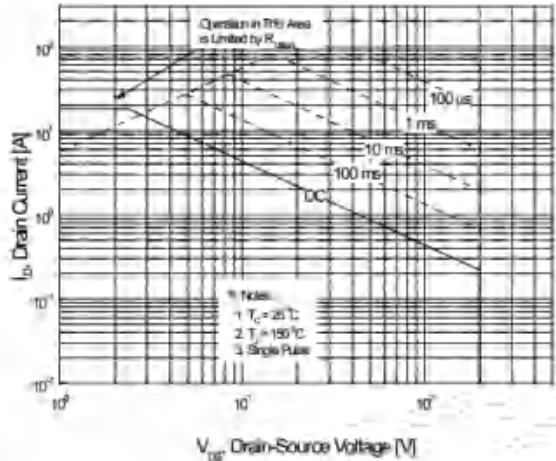
Maximum Drain Current vs. Case Temperature



Maximum Safe Operating Area For JCS640CH/VH/RH/SH

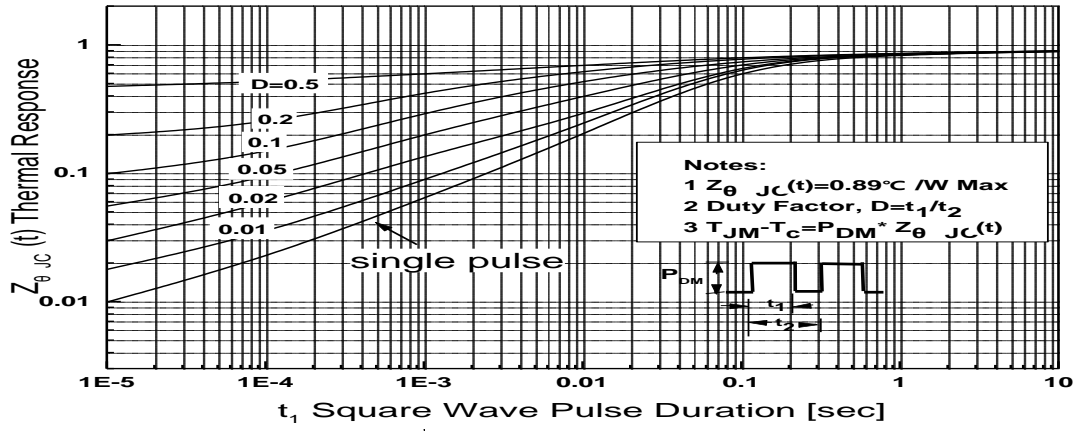


Maximum Safe Operating Area For JCS640FH

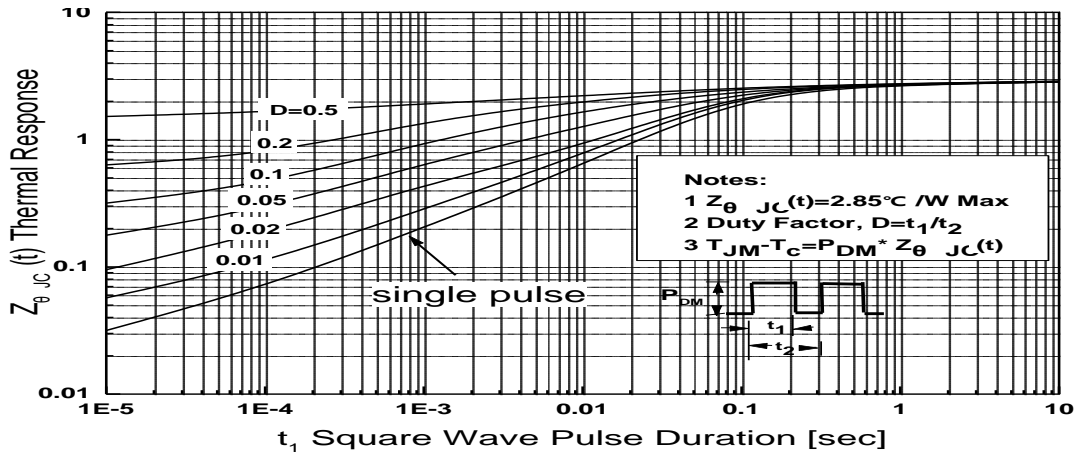


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Transient Thermal Response Curve
For JCS640CH/VH/RH/SH



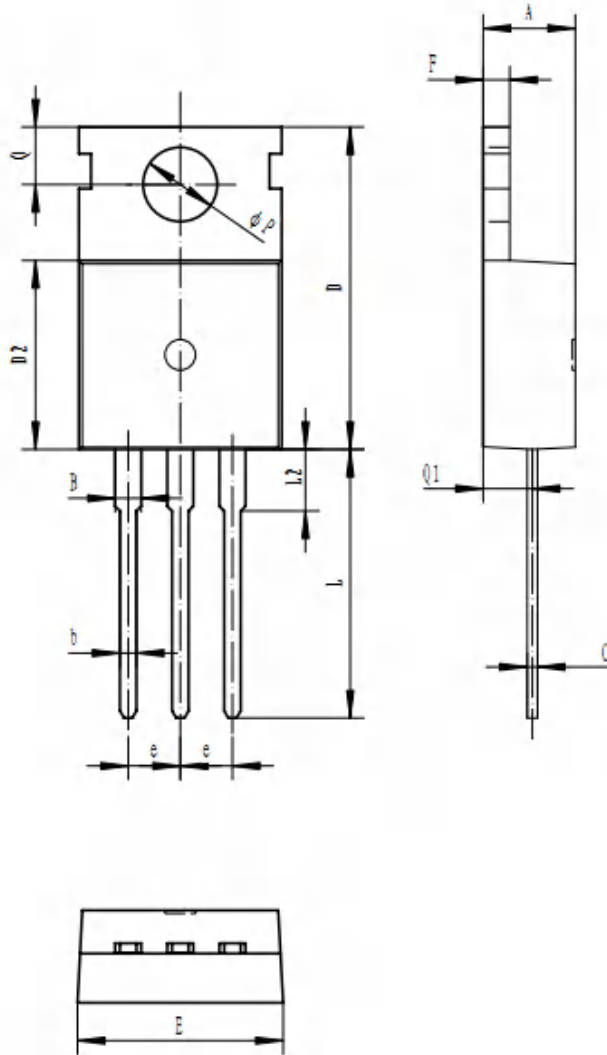
Transient Thermal Response Curve
For JCS640FH



外形尺寸 PACKAGE MECHANICAL DATA

TO-220C

单位 Unit: mm

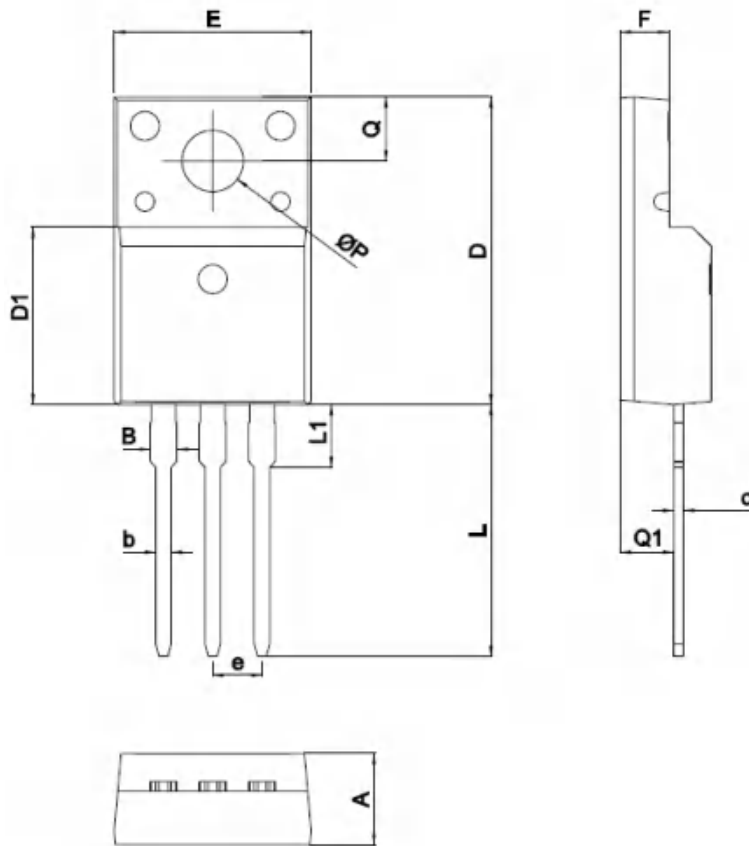


| 符号 symbol | MIN | MAX |
|--------------|-------|-------|
| A | 4.30 | 4.70 |
| B | 1.22 | 1.40 |
| b | 0.70 | 0.95 |
| e | 0.40 | 0.65 |
| D | 15.20 | 16.20 |
| D2 | 9.00 | 9.40 |
| E | 9.70 | 10.10 |
| e | 2.39 | 2.69 |
| F | 1.25 | 1.40 |
| L | 12.60 | 13.60 |
| L2 | 2.80 | 3.20 |
| Q | 2.60 | 3.00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

外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF

单位 Unit: mm

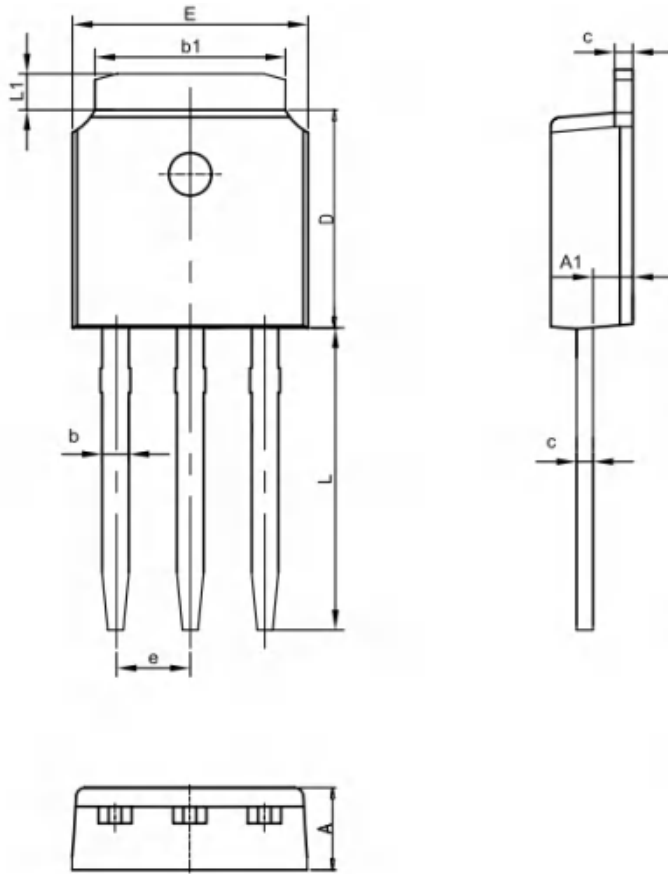


| SYMBOL | mm | |
|--------|----------|-------|
| | MIN | MAX |
| A | 4.5 | 4.9 |
| B | | 1.47 |
| b | 0.7 | 0.9 |
| c | 0.45 | 0.60 |
| D | 15.67 | 16.07 |
| D1 | 9.04 | 9.20 |
| e | 2.54TYPE | |
| E | 9.96 | 10.36 |
| F | 2.34 | 2.74 |
| L | 12.58 | 13.38 |
| L1 | 3.13 | 3.33 |
| Q | 3.2 | 3.4 |
|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

外形尺寸 PACKAGE MECHANICAL DATA

IPAK

单位 Unit: mm

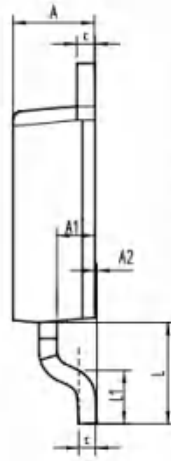
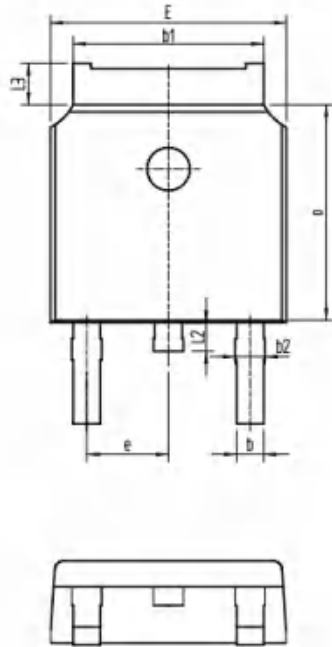


| SYMBOL | MM | |
|--------|----------|------|
| | MIN | MAX |
| A | 2.1 | 2.5 |
| A1 | 0.87 | 1.27 |
| b | 0.63 | 0.93 |
| b1 | 5.13 | 5.53 |
| c | 0.40 | 0.60 |
| D | 5.80 | 6.40 |
| E | 6.30 | 6.90 |
| L | 9.10 | 9.70 |
| e | 2.286BSC | |
| L1 | 0.82 | 1.22 |

外形尺寸 PACKAGE MECHANICAL DATA

DPAK

单位 Unit: mm

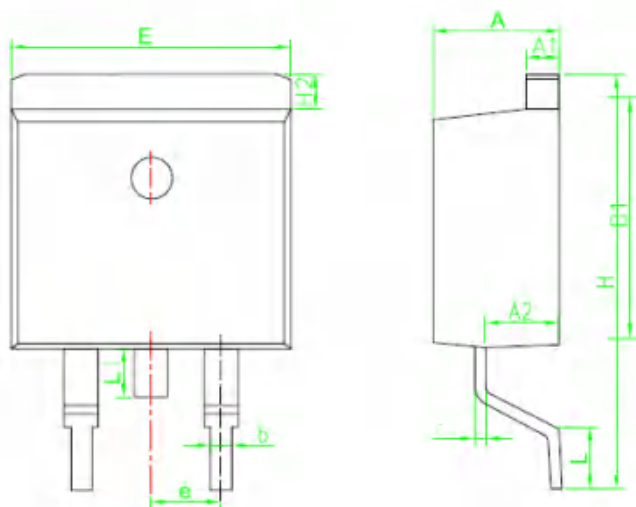


| SYMBOL | mm | |
|--------|----------|------|
| | MIN | MAX |
| A | 2.16 | 2.41 |
| A1 | 0.97 | 1.17 |
| A2 | 0.00 | 0.15 |
| b | 0.63 | 0.93 |
| b1 | 5.13 | 5.53 |
| b2 | 0.66 | 0.96 |
| c | 0.40 | 0.60 |
| D | 5.80 | 6.40 |
| E | 6.30 | 6.90 |
| e | 2.286BSC | |
| L | 2.50 | 3.30 |
| L1 | 1.20 | 1.80 |
| L2 | 0.60 | 1.00 |
| L3 | 0.85 | 1.30 |

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 |