

General Description

The Sanrise SRC65R950 is a high voltage power MOSFET, fabricated using advanced super junction technology. The resulting device has extremely low on resistance, low gate charge and fast switching time, making it especially suitable for applications which require superior power density and outstanding efficiency.

The SRC65R950 break down voltage is 650V and it has a high rugged avalanche characteristics.

The SRC65R950 is available in TO-251, TO-252, TO-263-2 and TO-220F packages.

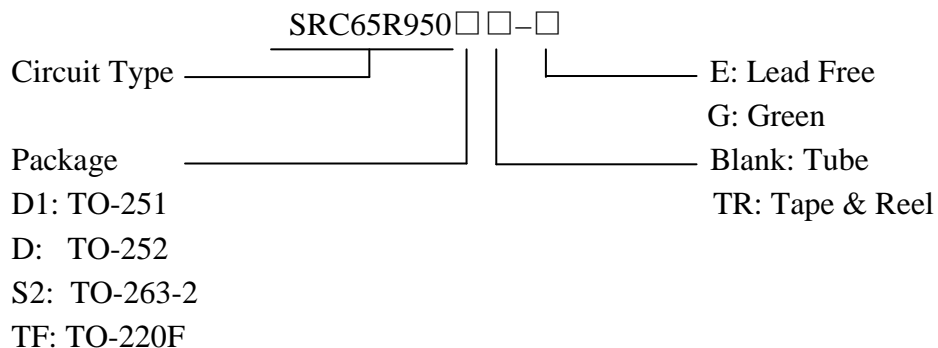
Features

- Ultra Low $R_{DS(ON)} = 950m\Omega @ V_{GS} = 10V$.
- Ultra Low Gate Charge, $Q_g = 8.9nC$ typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved

Application

- TV Power
- High Performance Charger / Adapter
- LED Lighting Power

Ordering Information



Symbol

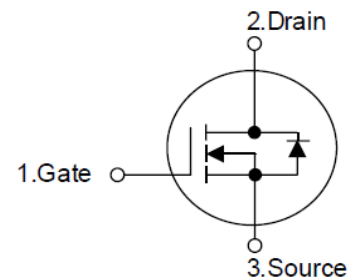


Figure 1 Symbol of SRC65R950

Package Type

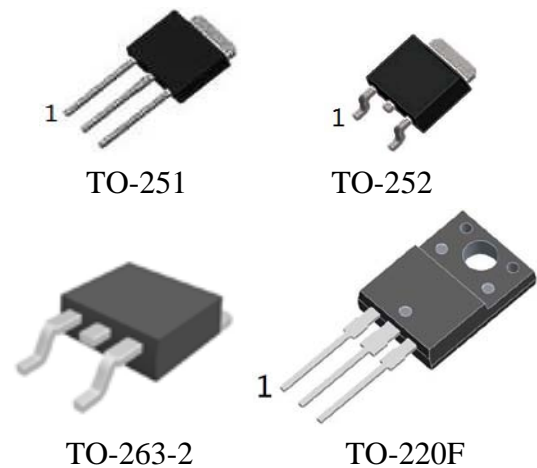


Figure 2 Package Types of SRC65R950

Package	Part Number		Marking ID		Packing Type
	Lead Free	Green	Lead Free	Green	
TO-251	SRC65R950D1-E	SRC65R950D1-G	SRC65R950D1E	SRC65R950D1G	Tube
TO-252	SRC65R950DTR-E	SRC65R950DTR-G	SRC65R950DE	SRC65R950DG	Tape & Reel
TO-263-2	SRC65R950S2TR-E	SRC65R950S2TR-G	SRC65R950S2E	SRC65R950S2G	Tape & Reel
TO-220F	SRC65R950TF-E	SRC65R950TF-G	SRC65R950TFE	SRC65R950TFG	Tube

Absolute Maximum Ratings

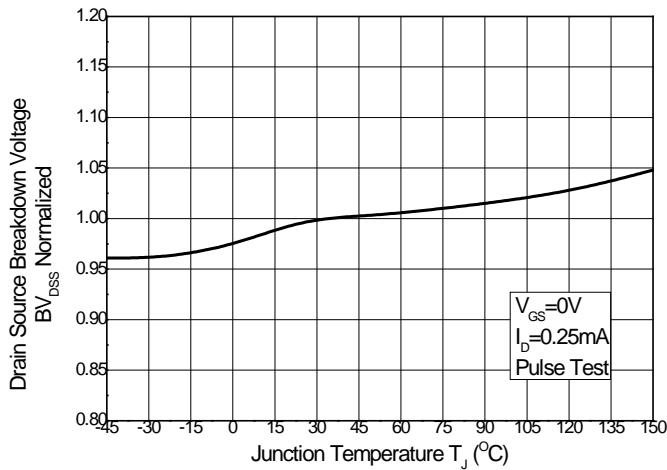
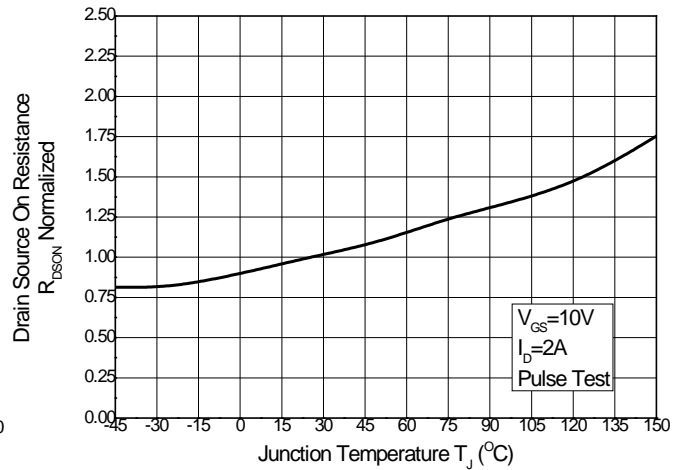
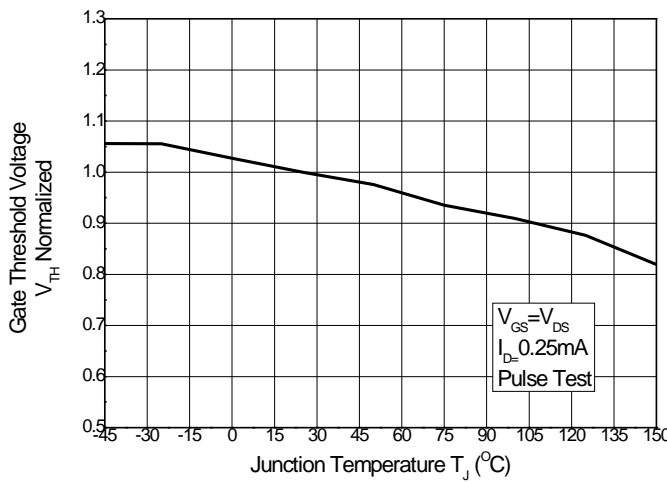
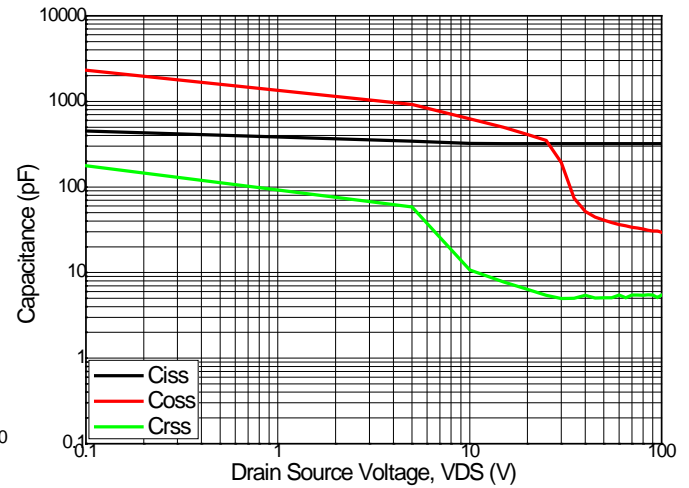
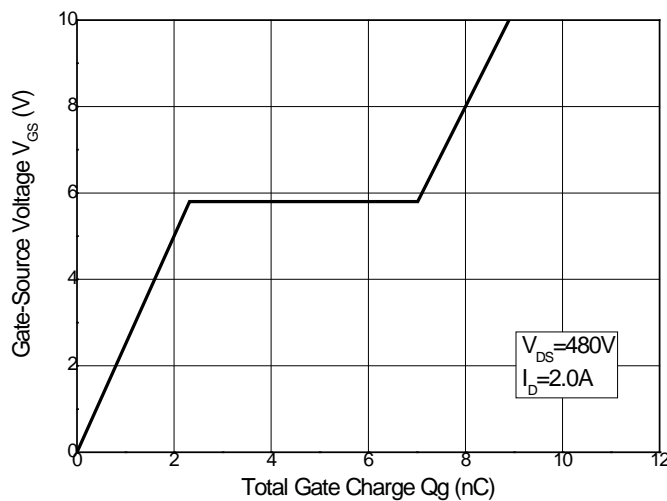
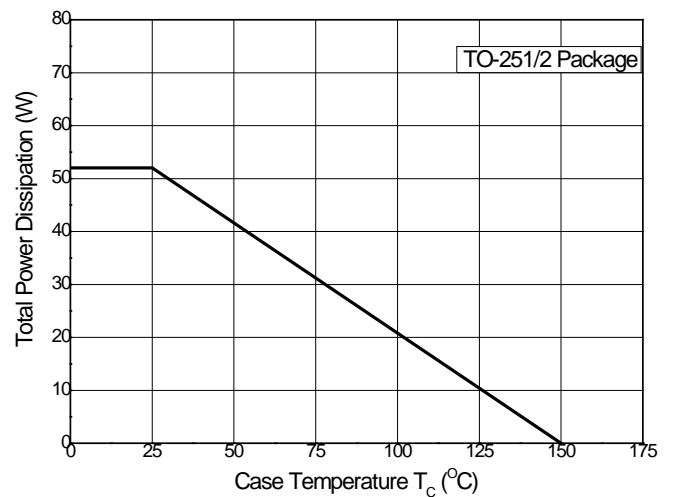
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	680	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current	$T_C=25^{\circ}C$	I_D	4.4	A
	$T_C=125^{\circ}C$		2.0	
Pulsed Drain Current (Note 2)		I_{DM}	12.3	A
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	130	mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.2	mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	2.0	A
Continuous Diode Forward Current		I_S	4.4	A
Diode Pulse Current		$I_{S,PULSE}$	12.3	A
Operating Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-65 to 150	°C
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	300	°C

Note:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $I_{AS} = 2A$, $V_{DD} = 60V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$

Electrical Characteristics
 $T_J = 25^{\circ}\text{C}$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	Forward	$I_{GSSF}, V_{GS}=30V, V_{DS}=0V$			100	nA
	Reverse	$I_{GSSR}, V_{GS}=-30V, V_{DS}=0V$			-100	
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.4	4.3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.0A$		900	950	$m\Omega$
Gate Resistance	R_G	$f=1MHz, \text{Open Drain}$		4.25		Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		320		pF
Output Capacitance	C_{OSS}			350		
Reverse Transfer Capacitance	C_{RSS}			2.0		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=2.0A, R_G=10\Omega, V_{GS}=10V$		8		ns
Rise Time	t_r			12		
Turn-off Delay Time	$t_{d(off)}$			10		
Fall Time	t_f			18		
Gate Charge Characteristics						
Gate to Source Charge	Q_{gs}	$V_{DD}=480V, I_D=2.0A, V_{GS}=0 \text{ to } 10V$		2.32		nC
Gate to Drain Charge	Q_{gd}			4.7		
Gate Charge Total	Q_g			8.9		
Gate Plateau Voltage	$V_{plateau}$			5.8		V
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=2A$		0.81	1.1	V
Reverse Recovery Time	t_{rr}	$V_R=400V, I_F=2.0A, dI_F/dt=100A/\mu s$		155.8		ns
Reverse Recovery Charge	Q_{rr}			0.89		μC
Peak Reverse Recovery Current	I_{rrm}			11.3		A

Typical Performance Characteristics

Figure 3 Breakdown Voltage vs. Temperature

Figure 4 On Resistance vs. Temperature

Figure 5 Gate Threshold Voltage vs. Temperature

Figure 6 Capacitance Characteristics

Figure 7 Gate Charge Characteristics

Figure 8 Power Dissipation vs. Temperature

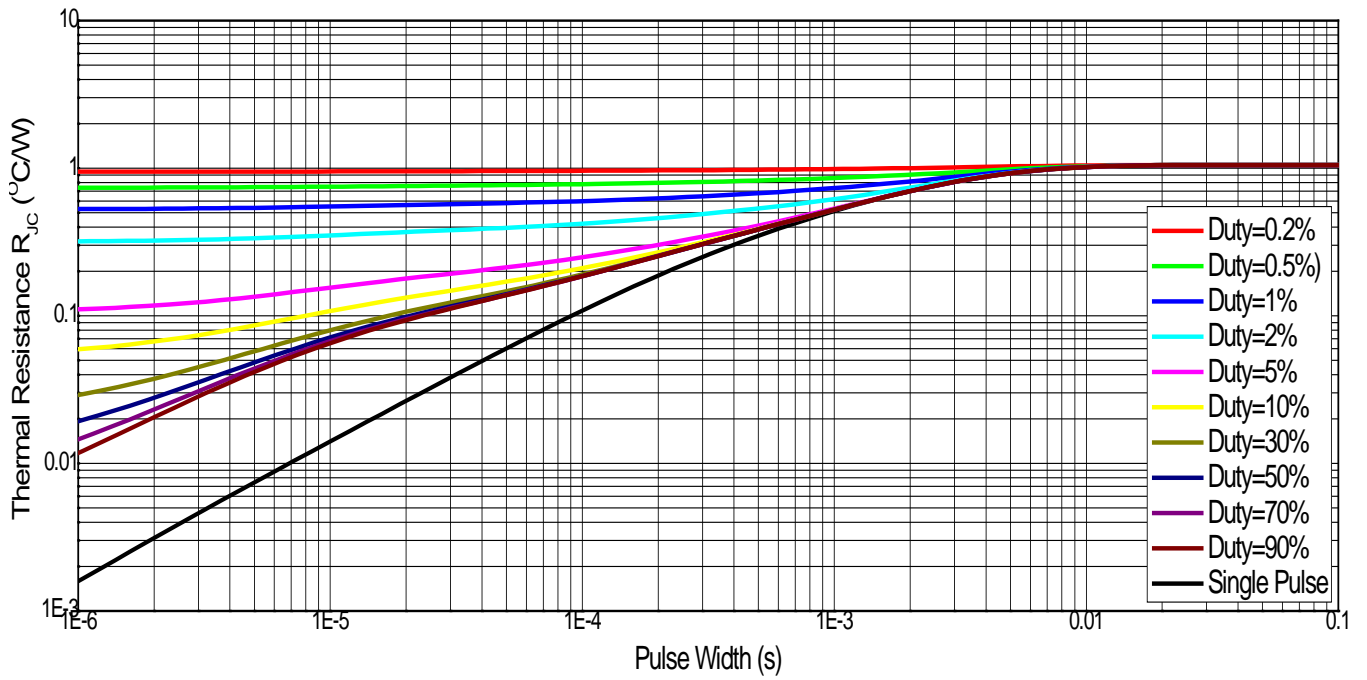
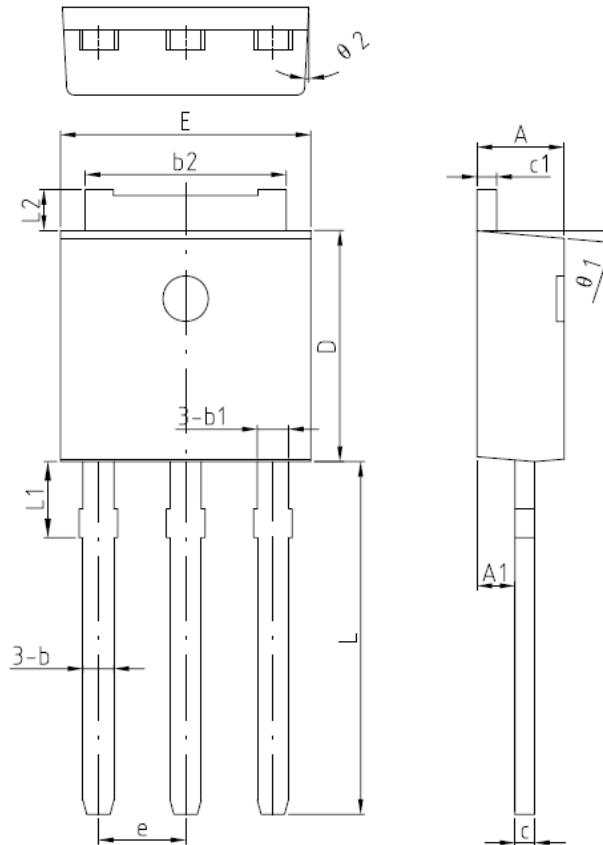
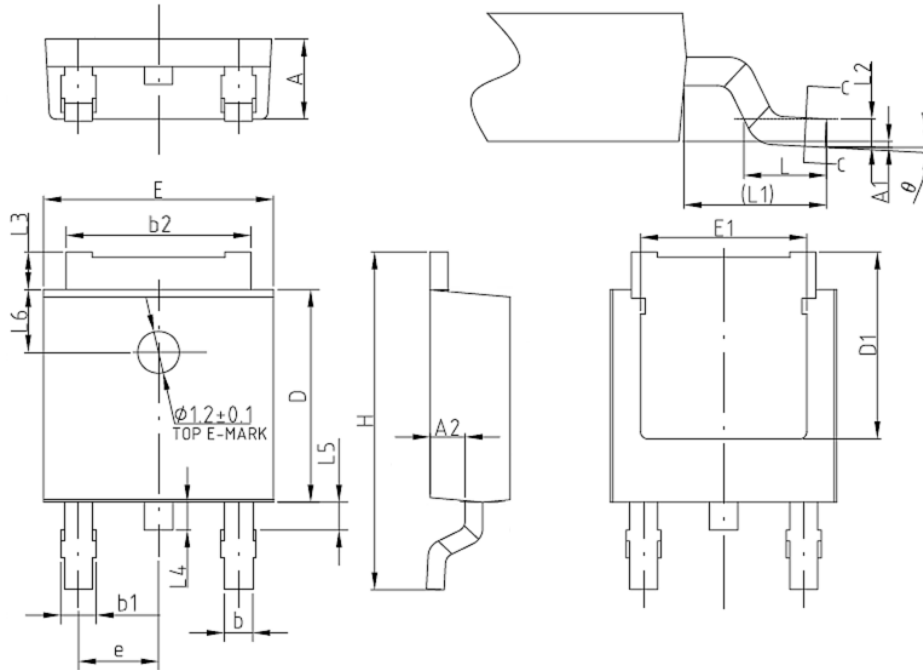


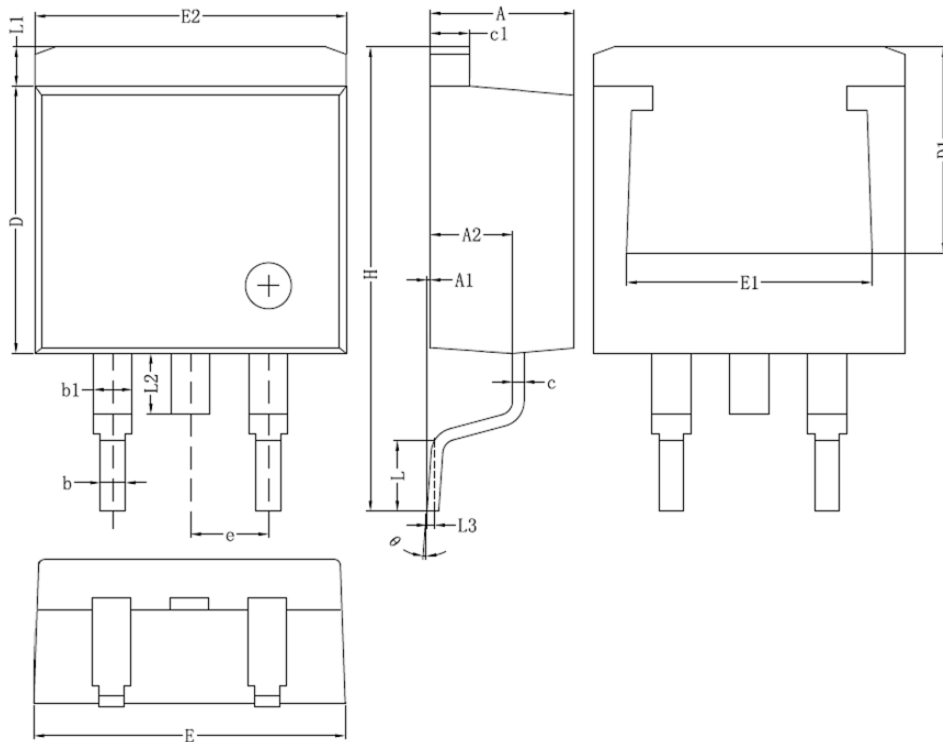
Figure 9 Transient Thermal Response Curve

Mechanical Dimensions
TO-251
Unit: mm


Symbol	Dimensions(mm)		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
A1	0.90	1.01	1.17
b	0.50	-	0.91
b1	-	0.81	-
b2	5.13	5.33	5.46
c	0.46	0.50	0.60
c1	0.46	0.50	0.60
D	5.95	6.10	6.25
E	6.45	6.60	6.75
e	2.286(BSC)		
L	9.00	9.30	9.60
L1	-	2.00	-
L2	0.90	-	1.25
θ1	-	5°	-
θ2	-	3°	-

Mechanical Dimensions (Continued)
TO-252
Unit: mm


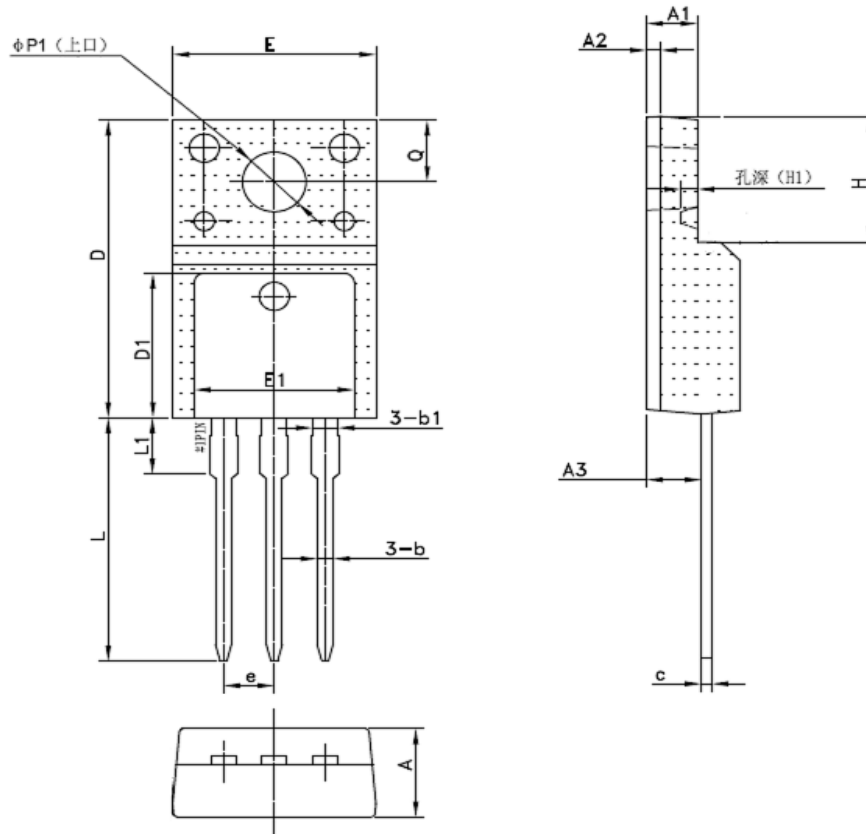
Symbol	Dimensions(mm)		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
A1	0	-	0.10
A2	0.90	1.00	1.17
b	0.70	0.76	0.90
b1	0.77	-	1.10
b2	5.13	5.33	5.46
c	0.45	-	0.60
D	5.95	6.10	6.25
D1	-	5.30	-
E	6.45	6.60	6.75
E1	-	4.80	-
e	2.286(BSC)		
H	9.70	10.10	10.40
L	1.25	1.50	1.75
L1	-	2.90	-
L2	-	0.51	-
L3	0.90	-	1.25
L4	-	0.80	-
L5	-	1.00	-
L6	-	1.80	-
θ	0°	-	8°

Mechanical Dimensions (Continued)
TO-263-2
Unit: mm


Symbol	Dimensions(mm)		
	Min.	Typ.	Max.
A	4.30	4.60	4.85
A1	0.00	0.10	0.25
A2	2.59	2.69	2.89
b	0.70	0.81	0.96
b1	-	1.27	-
c	0.36	0.40	0.61
c1	1.15	1.27	1.40
D	8.55	-	9.40
D1	6.40	-	-
E	9.80	10.10	10.31
E1	7.60	-	-
E2	9.80	10.00	10.20
e	2.54(BSC)		
H	14.70	15.20	16.00
L	2.00	2.30	2.84
L1	1.00	1.27	1.40
L2	-	-	2.20
L3	-	0.25	-
θ	0°	-	8°

Mechanical Dimensions (Continued)
TO-220F

Unit: mm



Symbol	Dimensions(mm)		
	Min.	Typ.	Max.
A	4.30	4.70	4.90
A1	2.34	2.54	2.90
A2	-	0.70	-
A3	2.56	2.76	2.96
b	0.55	-	0.95
b1	-	1.28	-
c	0.42	0.50	0.70
D	14.70	-	16.07
D1	-	7.70	-
E	9.96	10.16	10.36
E1	-	8.00	-
e	2.54(BSC)		
H	-	6.70	-
(H1)	-	(0.81)	-
L	12.48	12.98	13.50
L1	-	2.93	-
ΦP1	-	3.18	-
Q	2.90	3.30	3.50



Sanrise Technology Limited Company

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