

10A 650V Silicon Carbide Schottky Diode
SRD10V65A
General Description

The SRD10V65A is a Silicon Carbide Schottky Diode, which offers low V_F and superior switching performance for high frequency applications such as PFC, Power Supply, Inverter, etc.

The SRD10V65A is available in PDFN8*8, TO-252, TO-263-2, TO-220F-2, TO-22C-2, and TO-247-2 packages.

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature-independent Switching
- 175°C Operating Junction Temperature
- Non-Automotive Qualified

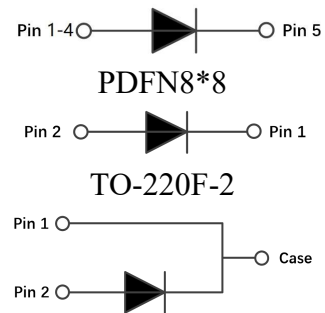
Application

- Switch Mode Power Supplies
- Motor Driver, PV Inverter
- PFC Application

Ordering Information

SRD10V65A□□-□		
Circuit Type		
Package		E: Lead Free G: Green Blank: Tube TR: Tape & Reel
GD88: PDFN8*8	DT: TO-252	
S2: TO-263-2	TF2: TO-220F-2	
TC2: TO-220C-2	T2: TO-247-2	

Package	Part Number	Marking ID	Packing Type
PDFN8*8-4	SRD10V65AGD88TR-G	SRD10V65AGD88G	Tape & Reel
TO-252	SRD10V65ADTR-G	SRD10V65ADG	Tape & Reel
TO-263	SRD10V65AS2TR-G	SRD10V65AS2G	Tape & Reel
TO-220F-2	SRD10V65ATF2-G	SRD10V65ATF2G	Tube
TO-220C-2	SRD10V65ATC2-G	SRD10V65ATC2G	Tube
TO-247-2	SRD10V65AT2-G	SRD10V65AT2G	Tube

Symbol


TO-252, TO-263, TO-220C-2 and TO-247-2

Figure 1 Symbol of SRD10V65A

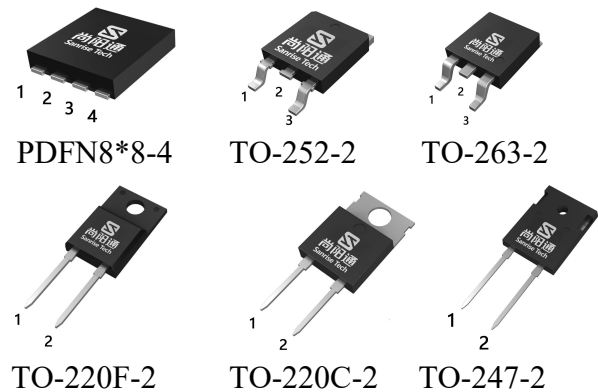
Package Type


Figure 2 Package Type of SRD10V65A

Absolute Maximum Ratings

Parameter	Test Conditions	Symbol	Value	Unit	
Repetitive Peak Reverse Voltage		V_{RRM}	650	V	
Surge Peak Reverse Voltage		V_{RSM}	650	V	
DC Blocking Voltage		V_R	650	V	
Forward Current	$T_c \leq 153^\circ\text{C}$	I_F	10	A	
Non-Repetitive Forward Surge Current	tp=10ms, Half Sine Wave	I_{FSM}	80	A	
	$T_c=110^\circ\text{C}$		70	A	
I^2t Value		$\int i^2 dt$	30	A ² S	
Power Dissipation		$P_{tot}^{(2)}$	PDFN8*8-4	136	W
			TO-220F-2	42	
			TO-220C-2	125	
			TO-247-2	230	
Operating Junction Temperature	-	T_J	-55 ~ 175	°C	
Storage Temperature	-	T_{STG}	-55 ~ 175	°C	
Soldering Temperature		T_{sold}	260	°C	

Thermal Resistance

Parameter	Package	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Case	PDFN8*8-4	$R_{thJC}^{(2)}$	-	0.8	1.1	°C/W
	TO-220F-2		-	3.5	-	
	TO-220C-2		-	1.16	-	
	TO-247-2		-	0.65	-	
Thermal Resistance, Junction-to-Ambient	PDFN8*8-4	$R_{thJA}^{(2)}$	-	-	45	
	TO-220F-2		-	80	-	
	TO-220C-2		-	80	-	
	TO-247-2		-	80	-	

Note:

 (1) Except for special instructions, $T_c = 25^\circ\text{C}$

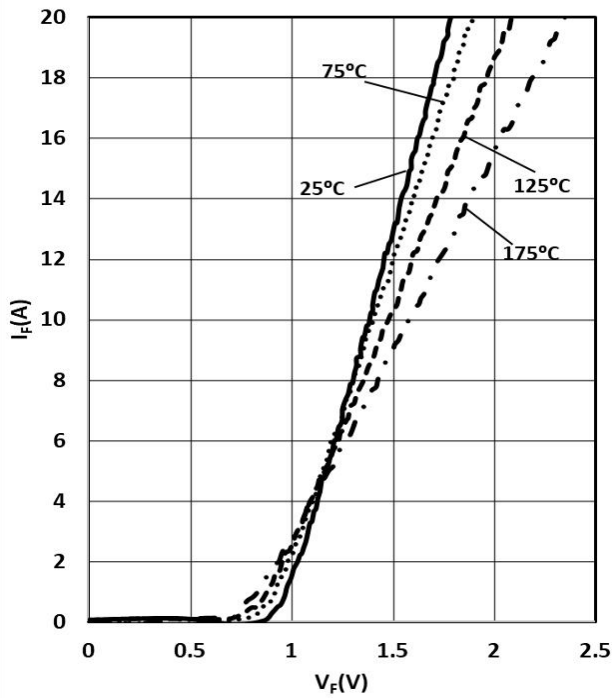
(2) Packages TO-252 and TO-263-2 are same as TO-220C-2

Electrical Characteristics

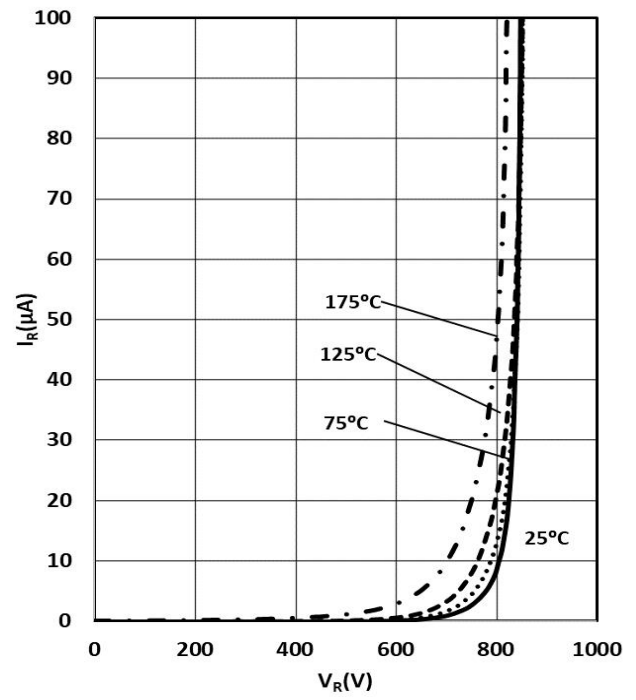
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}		650			V
Forward Voltage	V_F	$I_F=10A$		1.37	1.65	V
		$I_F=10A, T_j=175^{\circ}C$		1.75	2.3	
Reverse Current	I_R	$V_R=650V$		1	20	μA
		$V_R=650V, T_j=175^{\circ}C$		5	100	
Total Capacitance	C	$V_R=1V, f=1MHz$		440		pF
		$V_R=200V, f=1MHz$		57		
		$V_R=400V, f=1MHz$		46		
Total Capacitive Charge	Q_C	$V_R=650V, I_F=10A$ $dI_F/dt=200A/us$		25		nC
Capacitance Stored Energy	E_c	$V_R=400V$		3.7		μJ
Single Pulse Avalanche Energy	EAS	$L=2mH$		120		mJ
		$L=2mH, T_j=110^{\circ}C$		90		

Note:

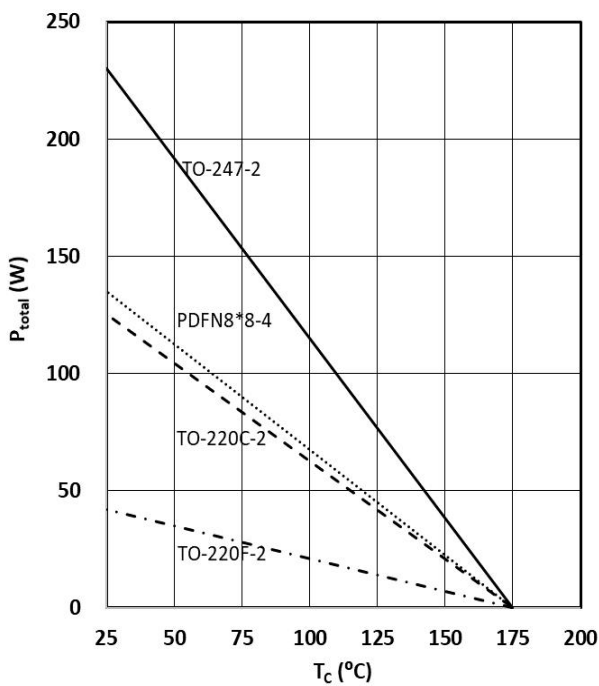
 Except for special instructions, $T_j=25^{\circ}C$

Typical Performance Characteristics
Figure 3: Forward Characteristics


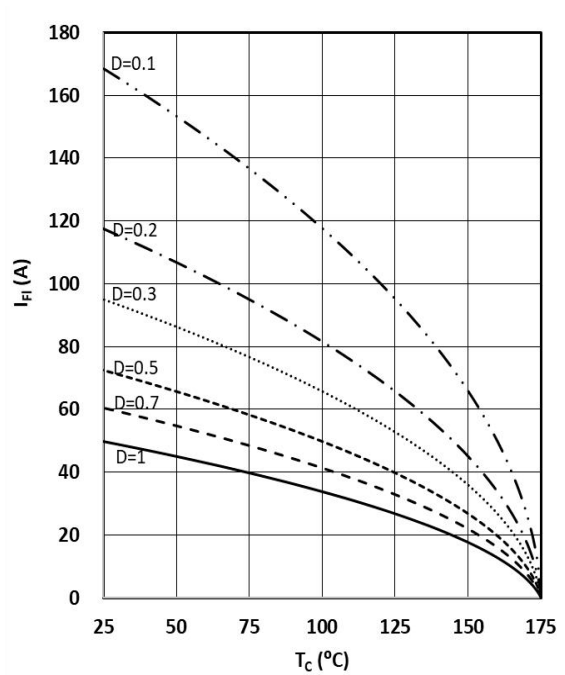
$$I_F = f(V_F);$$

Figure 4: Reverse Characteristics


$$I_R = f(V_R);$$

Figure 5: Power Derating


$$P_{total} = f(T_c);$$

Figure 6: Diode Forward Current


$$I_F = f(T_c); \text{ TO-247-2}$$

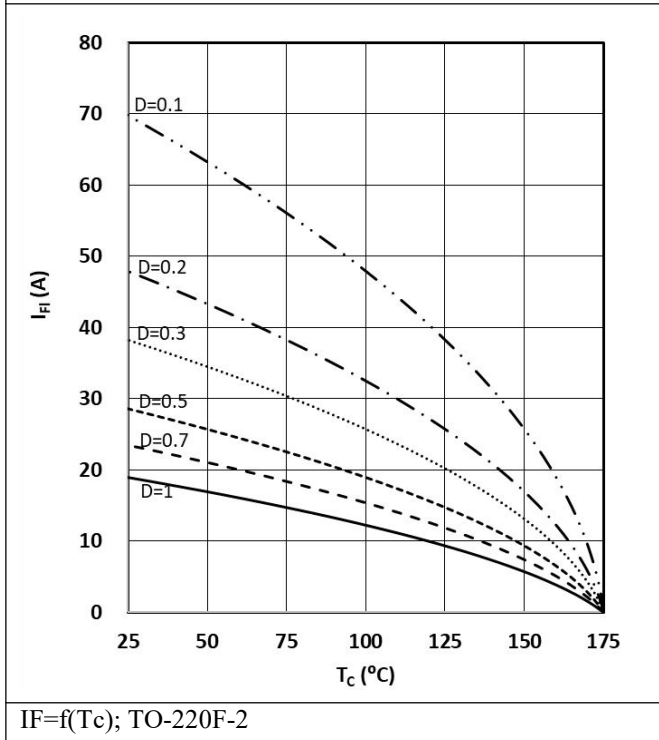
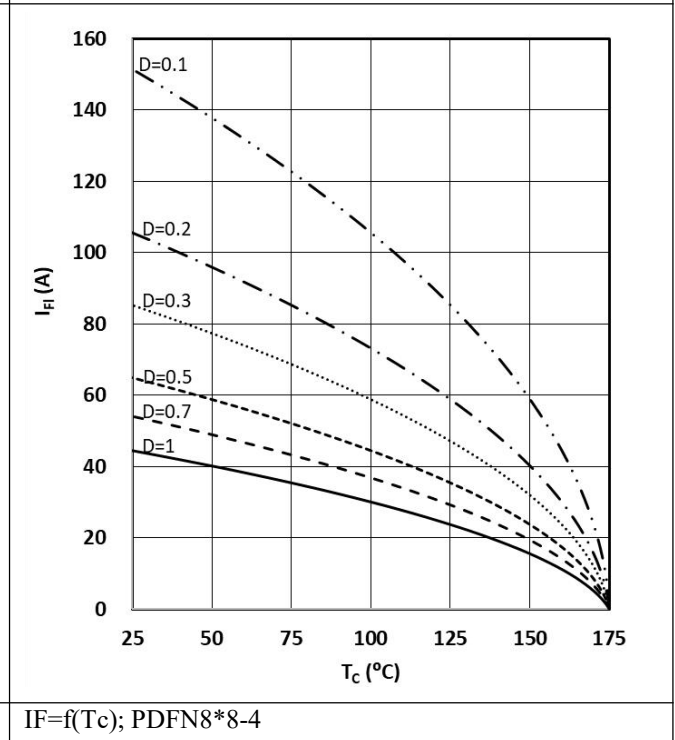
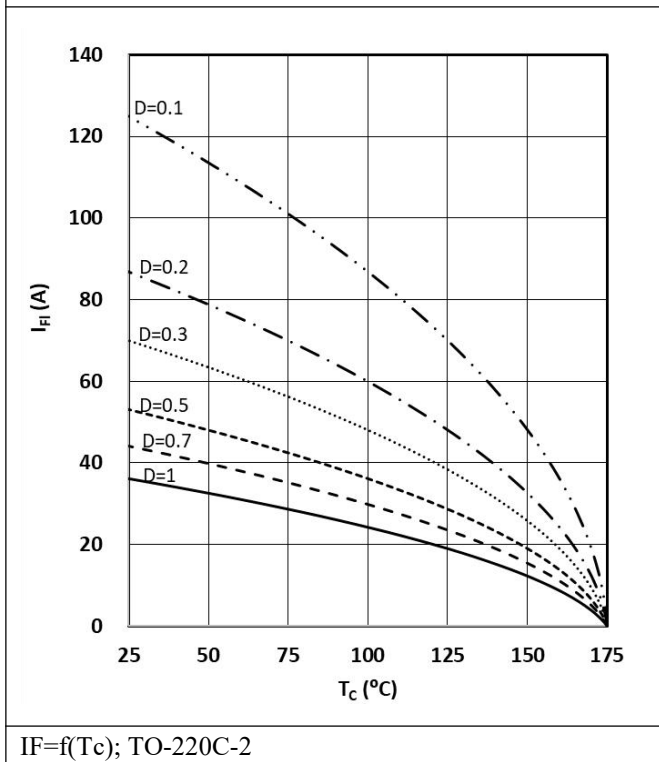
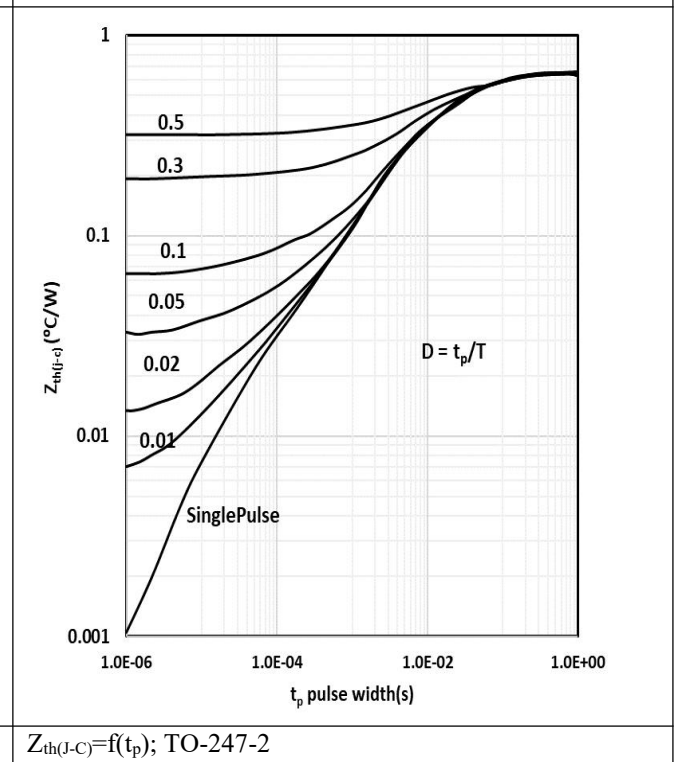
Figure 7: Diode Forward Current

Figure 8: Diode Forward Current

Figure 9: Diode Forward Current

Figure 10: Transient Thermal Impedance


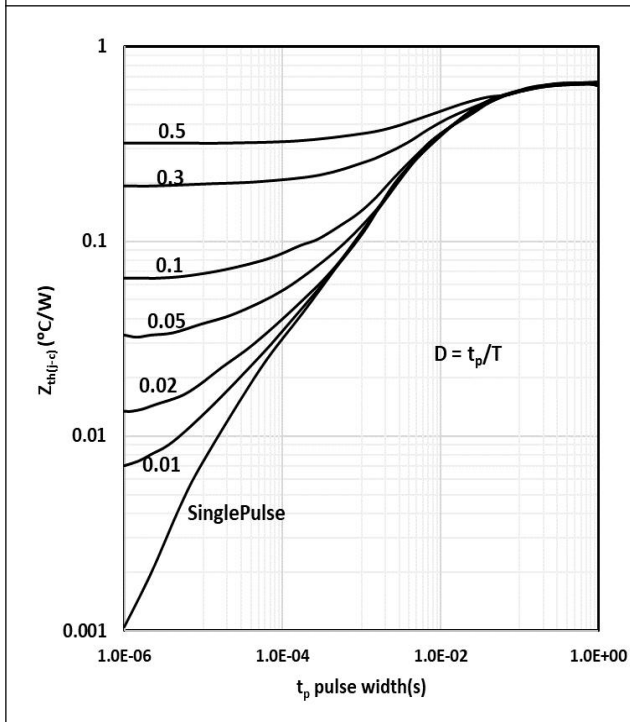
Figure 11: Transient Thermal Impedance

 $Z_{th(j-c)}=f(t_p)$; TO-220F-2

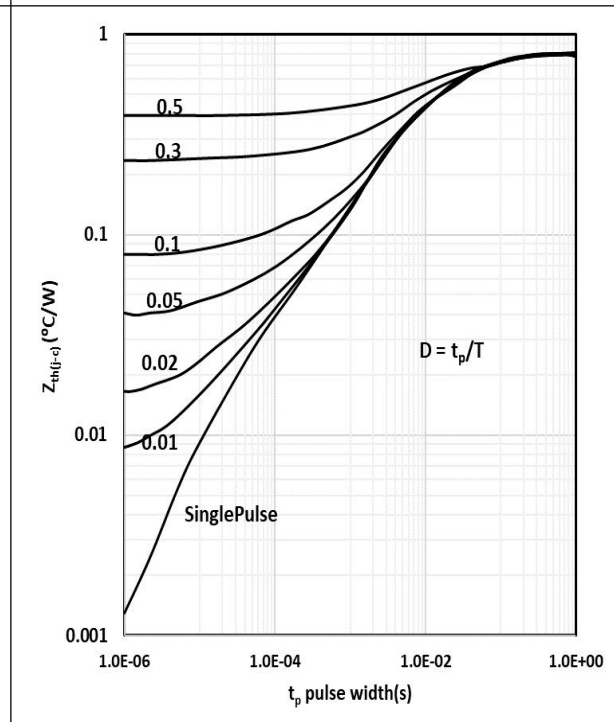
Figure 12: Transient Thermal Impedance

 $Z_{th(j-c)}=f(t_p)$; PDFN8*8-4

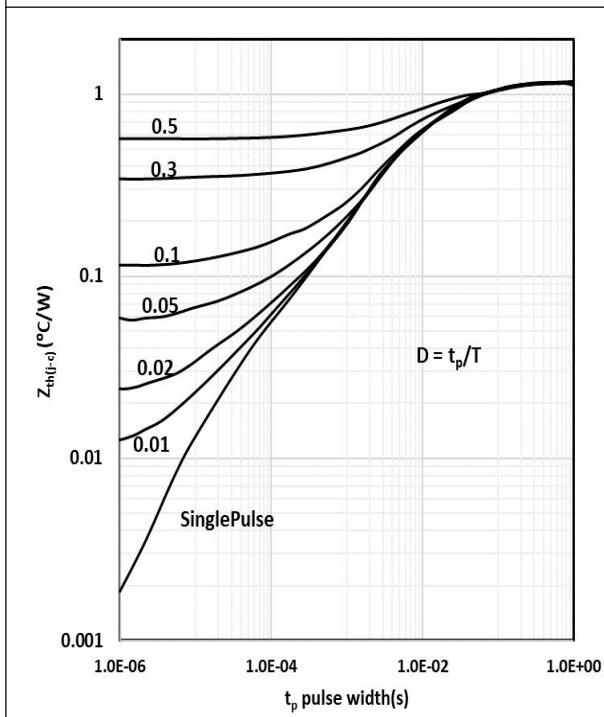
Figure 13: Transient Thermal Impedance

 $Z_{th(j-c)}=f(t_p)$; TO-220C-2

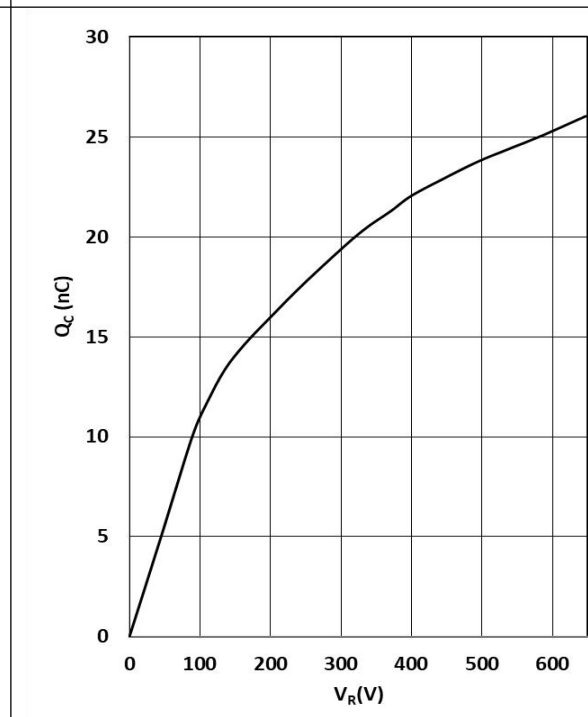
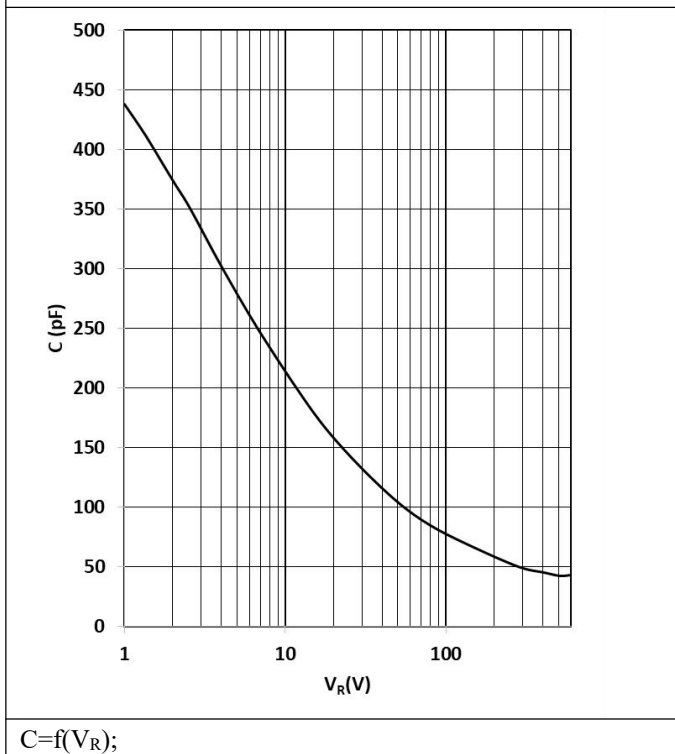
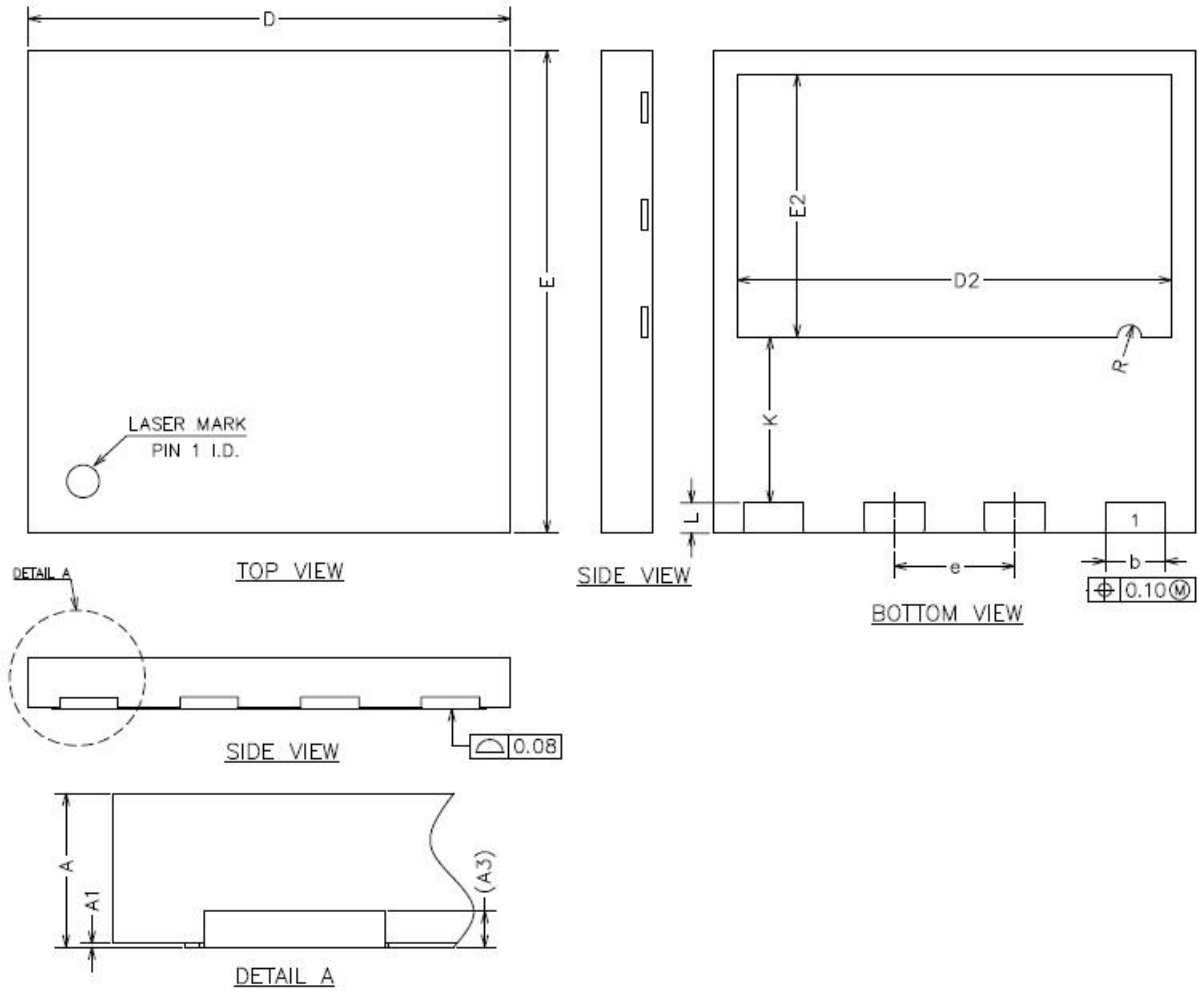
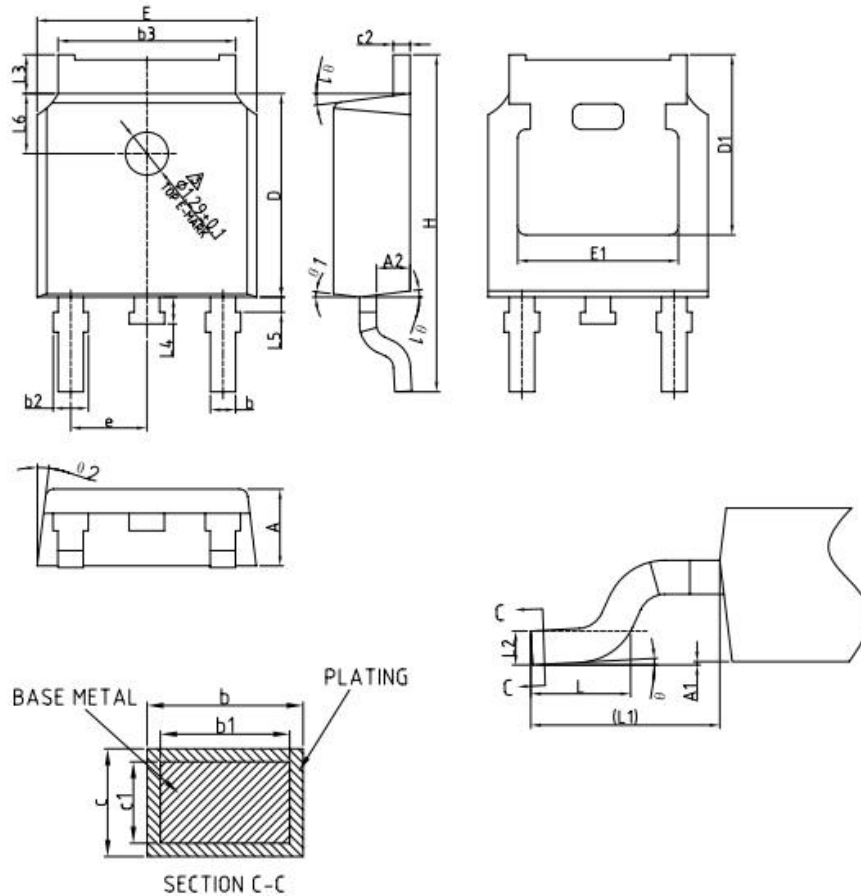
Figure 14: Total Capacitive Charge

 $Q_c=f(V_R)$;

Figure 15: Total Capacitance

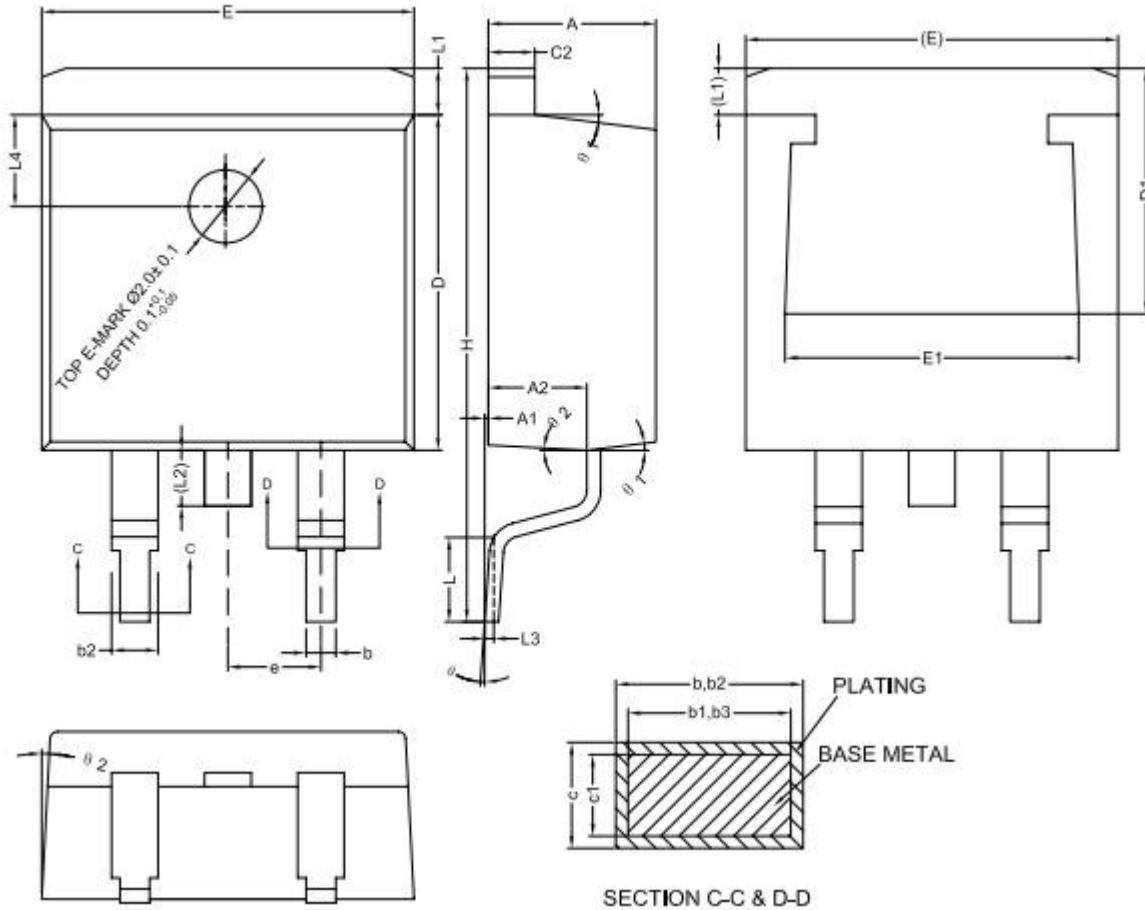


Mechanical Dimensions
PDFN8*8
Unit: mm


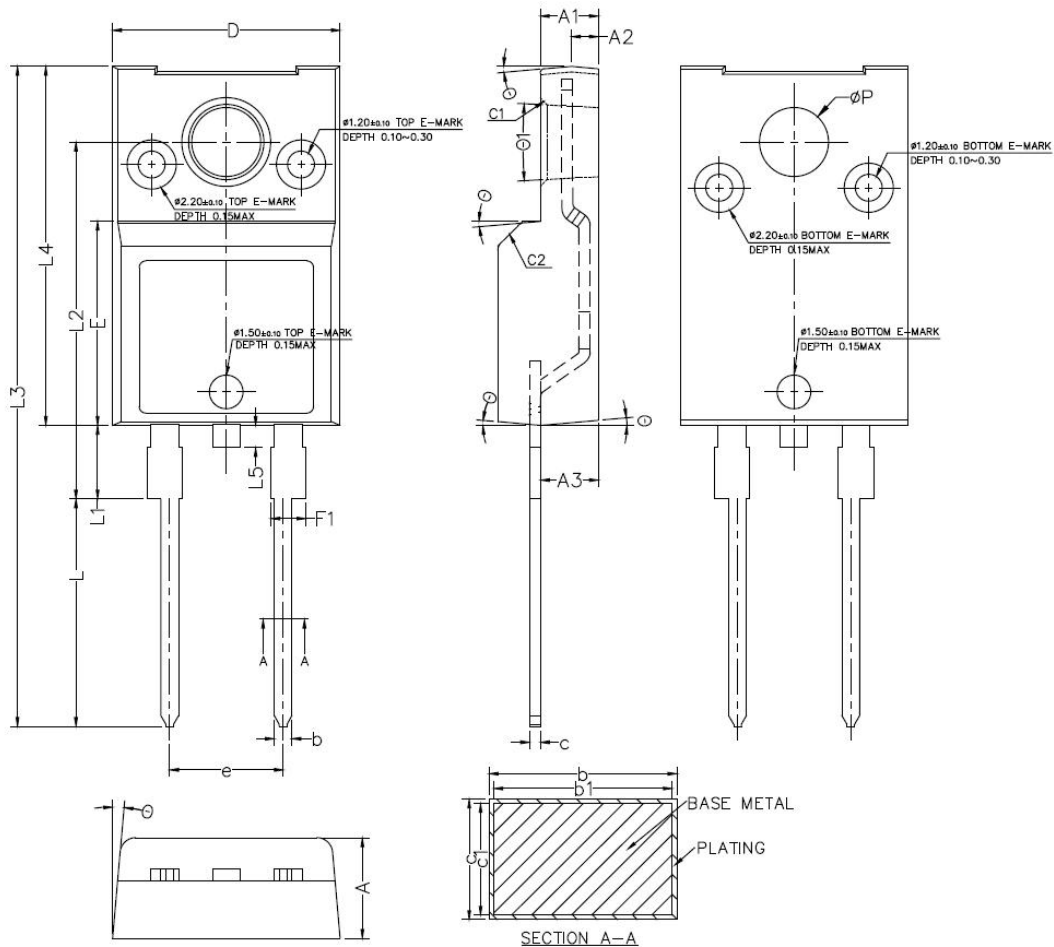
Symbol	Dimensions(mm)		
	Min.	Typ.	Max.
A	0.85	0.90	0.95
A1	0.00	0.02	0.05
A3	0.20REF		
b	0.90	1.00	1.10
D	7.90	8.00	8.10
D2	7.10	7.20	7.30
E	7.90	8.00	8.10
E2	4.25	4.35	4.45
e	1.90	2.00	2.10
K	2.65	2.75	2.85
L	0.40	0.50	0.60
R	0.20REF		

Mechanical Dimensions (Continued)
TO-252-2
Unit: mm


Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.20	2.30	2.38	E1	4.70	-	-
A1	0	-	0.10	e	2.186	2.286	2.386
A2	0.90	1.01	1.10	H	9.80	10.10	10.40
b	0.72	-	0.85	L	1.40	1.50	1.70
b1	0.71	0.76	0.81	L1	-	2.90REF	-
b2	0.72	-	0.90	L2	-	0.51BSC	-
b3	5.13	5.33	5.46	L3	0.90	-	1.25
c	0.47	-	0.60	L4	0.60	0.80	1.00
c1	0.46	0.51	0.56	L5	0.15	-	0.75
c2	0.47	-	0.60	L6	-	1.80REF	-
D	6.00	6.10	6.20	⊙	0°	-	8°
D1	5.25	-	-	⊙1	5°	7°	9°
E	6.50	6.60	6.70	⊙2	5°	7°	9°

Mechanical Dimensions
TO-263-2
Unit: mm


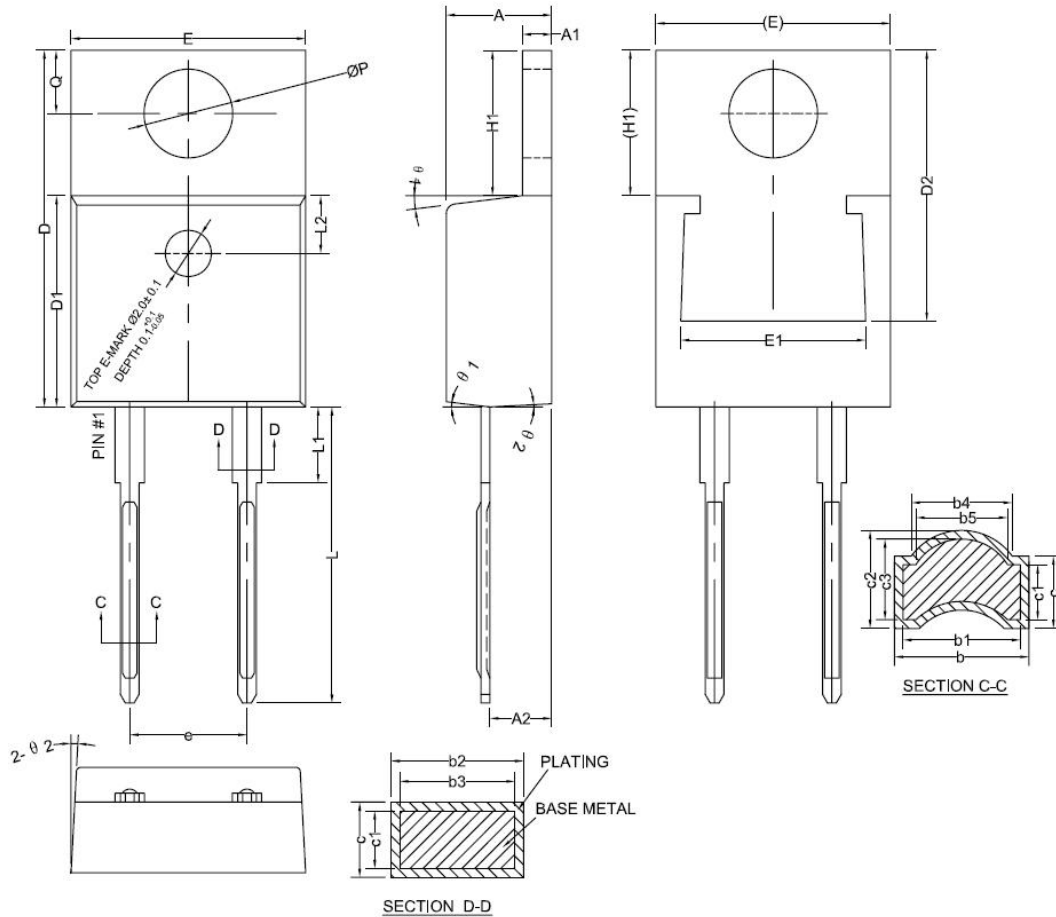
Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.40	4.57	4.70	E	10.06	10.16	10.26
A1	0.00	0.10	0.25	E1	7.80	-	8.20
A2	2.59	2.69	2.79	e	-	2.54BSC	-
b	0.77	-	0.90	H	14.70	15.10	15.50
b1	0.76	0.81	0.86	L	2.00	2.30	2.60
b2	1.23	-	1.36	L1	1.17	1.27	1.40
b3	1.22	1.27	1.32	L2	-	-	1.75
c	0.34	-	0.47	L3	-	0.25BSC	-
c1	0.33	0.38	0.43	L4	-	2.00REF	-
c2	1.22	-	1.32	⊙	0°	-	8°
D	9.05	9.15	9.25	⊙1	5°	7°	9°
D1	6.60	-	-	⊙2	1°	3°	5°

Mechanical Dimensions
TO-220F-2
Unit: mm


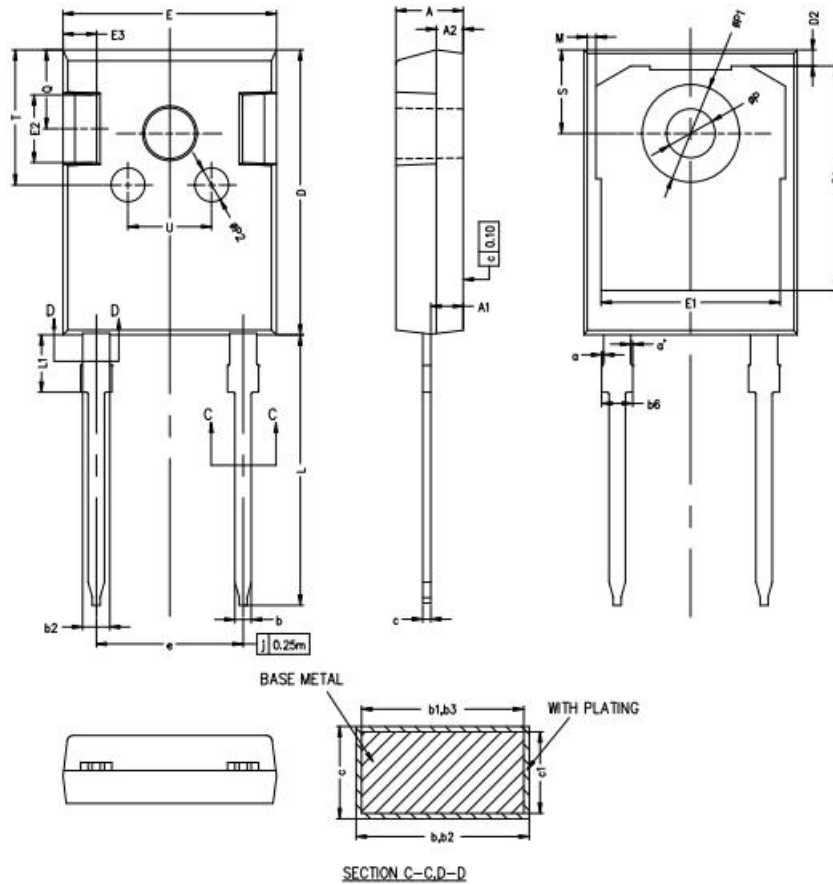
Symbol	Dimensions(mm)			Symbol	Dimensions(mm)		
	Min.	Typ.	Min.		Min.	Typ.	Min.
A	4.40	4.50	4.60	e	4.98	5.08	5.18
A1	2.50	2.60	2.70	F1	1.22	-	1.60
A2	1.10	1.20	1.30	L	10.00	10.20	10.30
A3	2.49	2.59	2.69	L1	3.15	3.30	3.45
b	0.76	-	0.89	L2	15.85	16.00	16.15
b1	0.75	0.8	0.85	L3	29.30	29.60	29.90
c	0.46	-	0.59	L4	16.00	16.10	16.20
c1	0.45	0.50	0.55	L5	0.50	-	1.00
C1	0.20	0.30	0.40	P	3.00	3.10	3.20
C2	1.00	1.10	1.20	θ	3°	5°	7°
D	10.10	10.20	10.30	θ 1	4°	6°	8°
E	9.05	9.15	9.25				

Mechanical Dimensions
TO-220C-2

Unit: mm



Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.40	4.57	4.70	D1	9.05	9.15	9.25
A1	1.25	-	1.34	D2	12.20	-	13.00
A2	2.59	2.69	2.79	E	9.96	10.16	10.29
b	0.77	-	0.89	E1	7.60	-	8.20
b1	0.76	0.81	0.86	e	4.98	5.08	5.18
b2	1.23	-	1.36	H1	6.10	6.30	6.48
b3	1.22	1.27	1.32	L	12.70	-	13.12
b4	0.67REF			L1	2.80	-	3.30
b5	0.64REF			L2	2.50REF		
c	0.36	-	0.45	ΦP	3.80	3.84	3.88
c1	0.35	0.38	0.41	Q	2.60	-	2.90
c2	0.59REF			$\theta 1$	5°	7°	9°
c3	0.56REF			$\theta 2$	1°	3°	5°
D	15.15	15.45	15.75				

Mechanical Dimensions
TO-247-2
Unit: mm


Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.90	5.00	5.10	E	15.70	15.80	15.90
A1	2.31	2.41	2.51	E1	13.06	13.26	13.46
A2	1.90	2.00	2.10	E2	4.90	5.00	5.10
a	0	-	0.15	E3	2.40	2.50	2.60
a'	0	-	0.15	e	10.78	10.88	10.98
b	1.16	-	1.29	L	19.80	19.92	20.10
b1	1.15	1.20	1.25	L1	3.93	-	4.46
b2	1.96	-	2.06	M	0.35	-	0.95
b3	1.95	2.00	2.02	P	3.50	3.60	3.70
b6	-	-	2.25	P1	7.00	-	7.40
c	0.59	-	0.66	P2	2.40	2.50	2.60
c1	0.58	0.60	0.62	Q	5.60	-	6.00
D	20.90	21.00	21.10	S	6.05	6.15	6.25
D1	16.25	16.55	16.85	T	9.80	-	10.20
D2	1.05	1.20	1.35	U	6.00	-	6.40



Shenzhen Sanrise Technology Co., LTD

<http://www.sanrise-tech.com>

IMPORTANT NOTICE

Shenzhen Sanrise Technology Co., LTD. reserves the right to make changes without further notice to any products or specifications herein. Shenzhen Sanrise Technology Co., LTD. does not assume any responsibility for use of any its products for any particular purpose, nor does Shenzhen Sanrise Technology Co., LTD. assume any liability arising out of the application or use of any its products or circuits. Shenzhen Sanrise Technology Co., LTD. does not convey any license under its patent rights or other rights nor the rights of others.

Main Site:

- Headquarter

Shenzhen Sanrise Technology Co., LTD.
A1206, Skyworth building, No. 008, gaoxinnan 1st Road,
Gaoxin District, Yuehai street, Nanshan District, ShenZhen,
P.R. China
Tel: +86-755-22953335
Fax: +86-755-22916878

- Shanghai Office

Shenzhen Sanrise Technology Co., LTD.
Rm.401, Building B, No. 666, Zhangheng Road,
Zhangjiang Hi-Tech Park, Shanghai, P.R.China
Tel: +86-21-68825918