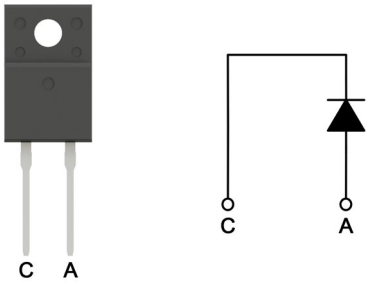
Product Summary

V_{RRM}	650	V
I_F @ T_C=135°C	6	A
Q_C @ V_R=400V	18	nC

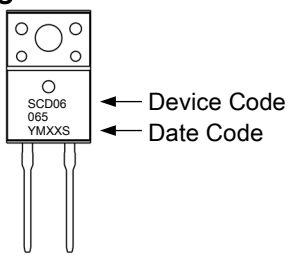
Features

- Negligible reverse recovery
- High surge current
- Positive temperature coefficient
- Pb-free lead plating and halogen-free

TO-220FP-2L



Marking



YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

S: Assembly site code, Site 1: A

Ordering Information

Device	Package	Shipping
SCD06065FP2-0-UF-G	TO-220FP-2L	50 pcs/tube, 40 tubes/box, 4 boxes / carton

0: Product rank, zero for no rank products.

UF: Packing spec, UB : 50 pcs / tube, 40 tubes/box

G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Continuous Forward Current @ T_C=25°C		I_F	12.6	A
Continuous Forward Current @ T_C=95°C			9	
Continuous Forward Current @ T_C=135°C			6	
Non-repetitive Forward Surge Current @ T_C=25°C	*a	I_{FSM}	48	
I^2t limit Value @ T_C=25°C , t_p=10ms		I^2t	11	A^2s
Total Power Dissipation	T_C=25°C	P_D	60	W
	T_C=110°C		26	
	T_A=25°C *b		5.4	
	T_A=110°C *b		2.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+175	°C
Steady State Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	2.5	°C/W
Steady State Thermal Resistance, Junction-to-Ambient	*b	$R_{\theta JA}$	28	

Electrical Characteristics (T_J=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
V_R	650	-	-	V	I_R=50μA
V_F	-	1.34	1.6	V	I_F=6A , T_J=25°C
	-	1.78	-		I_F=6A , T_J=175°C
I_R	-	0.68	50	μA	V_R=650V , T_J=25°C
	-	4.2	-		V_R=650V , T_J=175°C
Dynamic					
C_J	-	328	-	pF	V_R=0V, f=1MHz
	-	38	-		V_R=200V, f=1MHz
	-	37	-		V_R=400V, f=1MHz
Q_C	-	18	-	nC	V_R=400V, f=1MHz
E_C	-	3.1	-	μJ	V_R=400V, f=1MHz

Note:

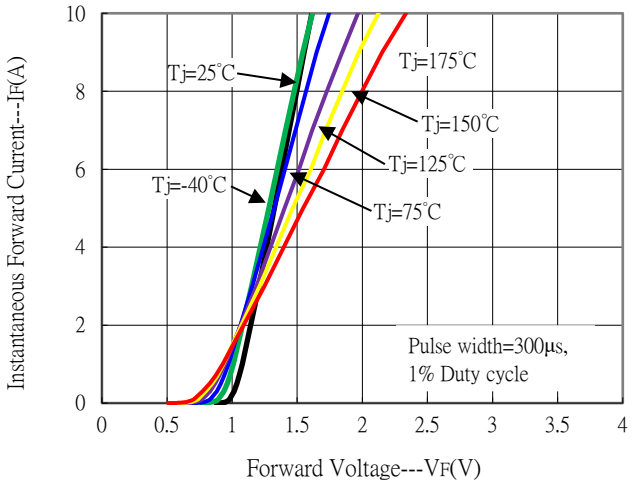
*a. Square wave, tp=10ms.

*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

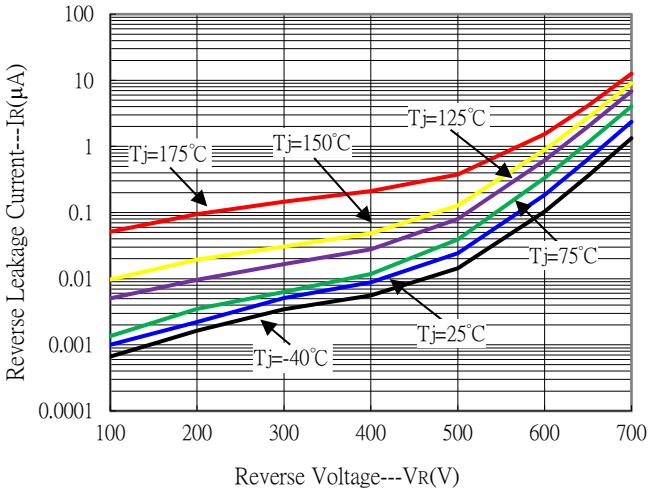
*c. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.

Typical Characteristics

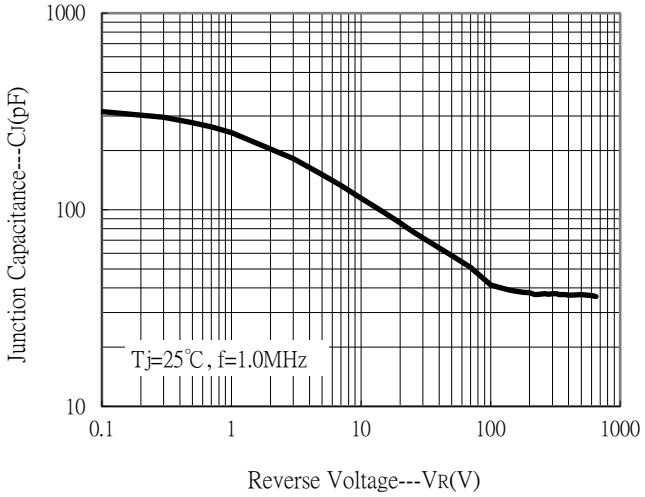
Forward Current vs Forward Voltage



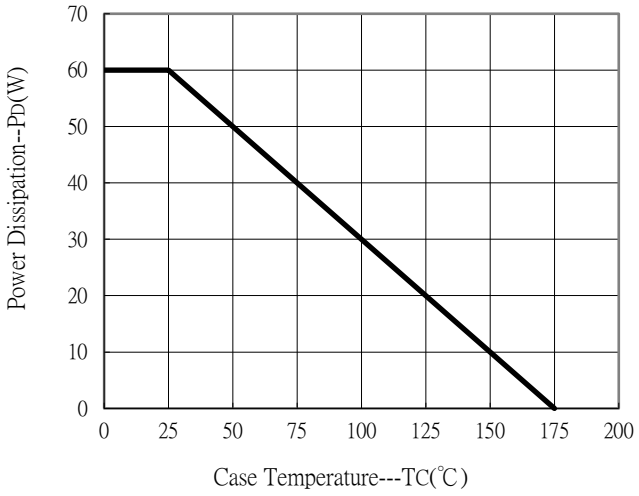
Reverse Leakage Current vs Reverse Voltage



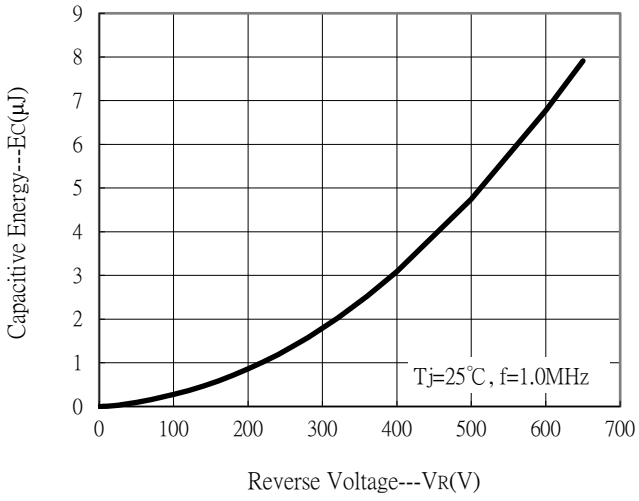
Junction Capacitance vs Reverse Voltage



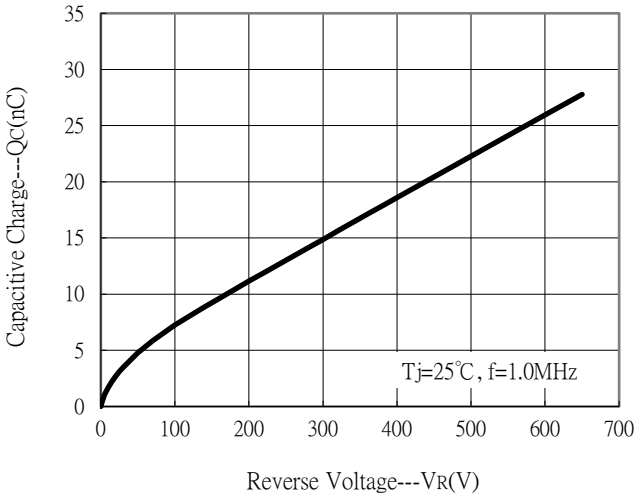
Power Dissipation Derating Curve



Capacitive Energy vs Reverse Voltage

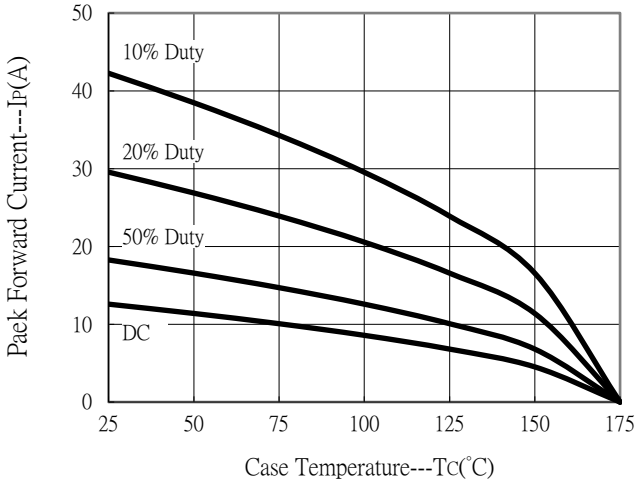


Capacitive Charge vs Reverse Voltage

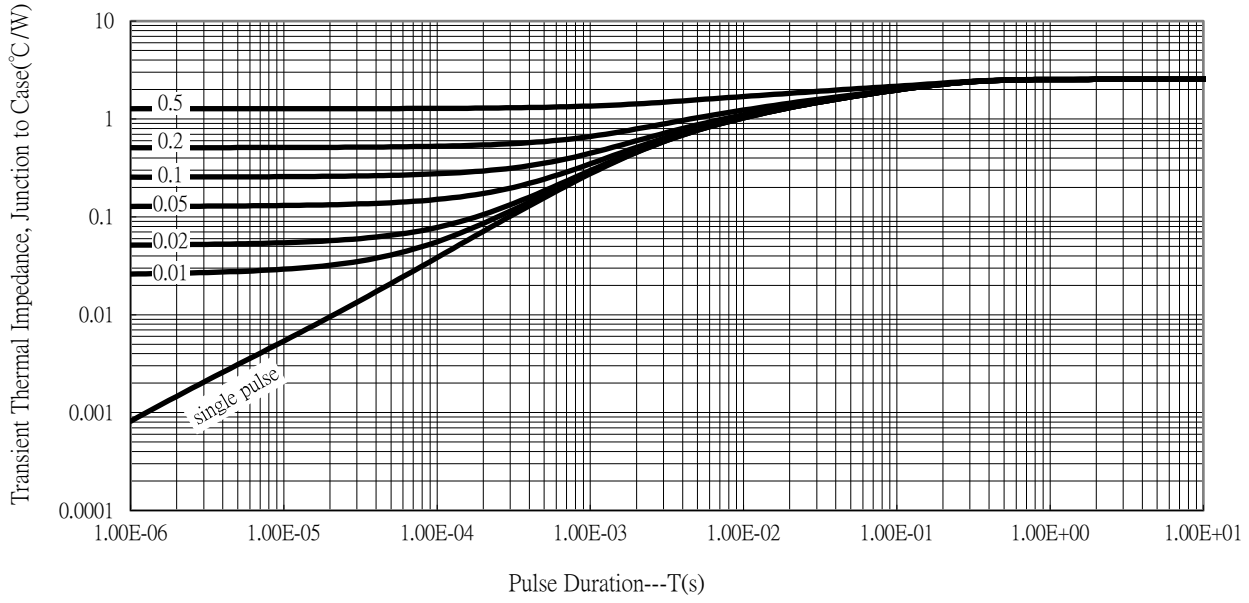


Typical Characteristics (Cont.)

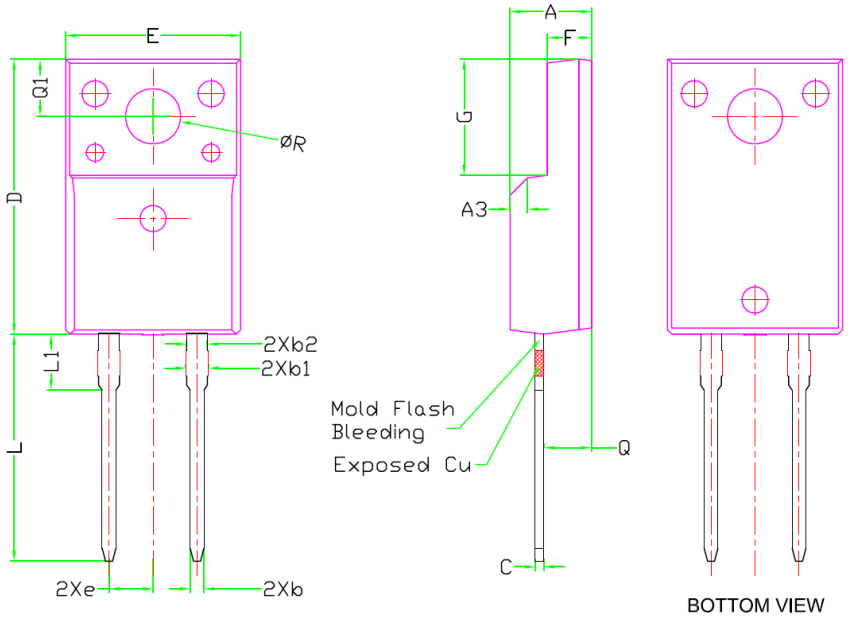
Peak Forward Current vs Case Temperature



Typical Transient Thermal Impedance



TO-220FP-2L Dimension



2-Lead TO-220FP-2L Plastic Package
CYS Package Code : F2

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Min.		Min.	Max.	Min.	Max.
A	4.60	4.80	0.181	0.189	F	2.44	2.64	0.096	0.104
b	0.70	0.91	0.028	0.036	G	6.50	6.90	0.256	0.272
b1	1.20	1.47	0.047	0.058	L	12.90	13.30	0.508	0.524
b2	1.10	1.30	0.043	0.051	L1	3.13	3.33	0.123	0.131
C	0.45	0.63	0.018	0.025	Q	2.65	2.85	0.104	0.112
D	15.80	15.97	0.622	0.629	Q1	3.20	3.40	0.126	0.134
e	2.54		0.100		ΦR	3.08	3.28	0.121	0.129
E	10.00	10.30	0.394	0.406					

Note:

- Controlling dimension: millimeters.
- Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
- If there is any question with packing specification or packing method, please contact your local CYStek sales office.

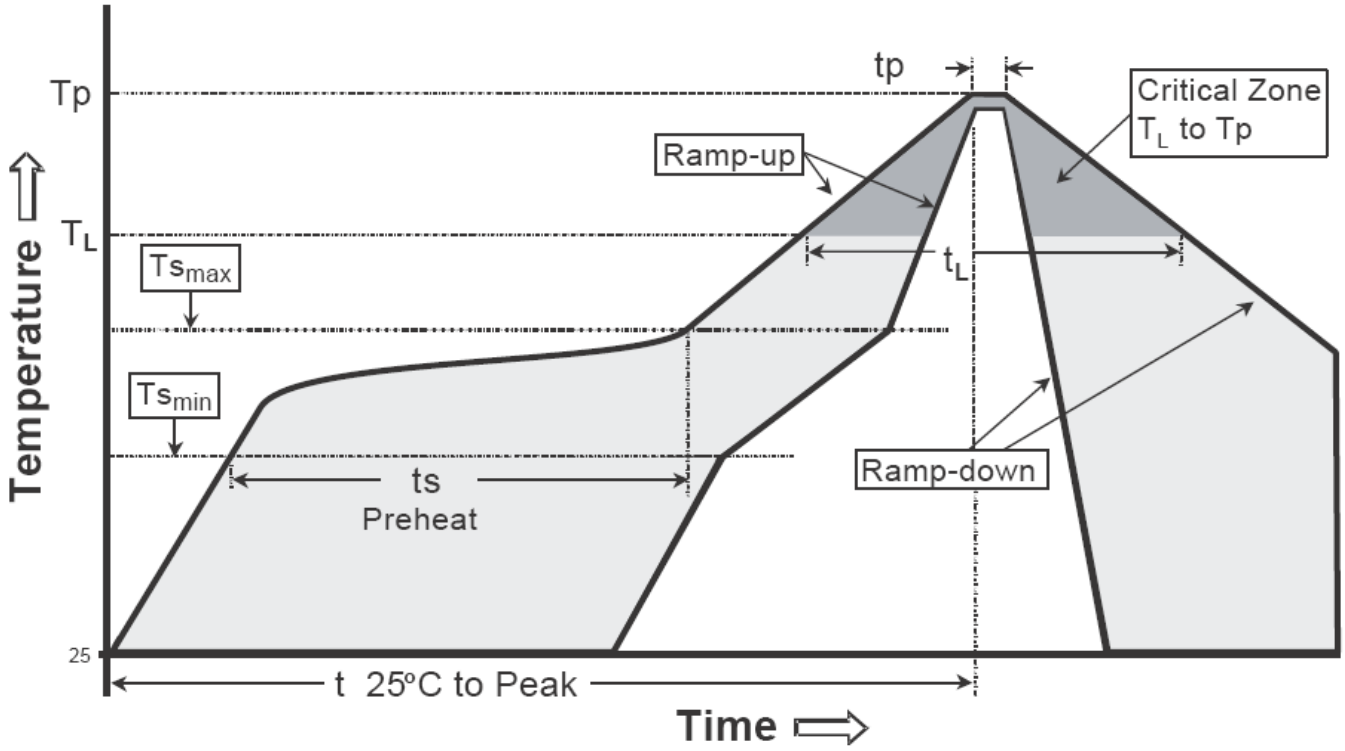
Material:

- Lead: pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.