

Features

- New 6th Generation Technology
- Low Forward Voltage Drop (V_F)
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Low Leakage Current (I_r)
- Temperature-Independent Switching Behavior
- Positive Temperature Coefficient on V_F

Benefits

- Higher System Level Efficiency
- Increase System Power Density
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies (SMPS)
- Battery Charging Systems
- Industrial Power Supplies
- Server/Telecom Power Supplies
- Solar

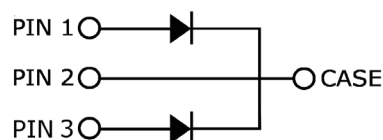
Part Number	Package	Marking
C6D20065D	TO-247-3	C6D20065



TO-247-3

V_{RRM}	=	650 V
$I_F (T_c=155^\circ\text{C})$	=	20 A**
Q_c	=	35 nC*

Package



Maximum Ratings ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_{DC}	DC Blocking Voltage	650	V		
I_F	Continuous Forward Current (Per Leg/Device)	38*/76** 20*/40** 10*/20**	A	$T_c=25^\circ\text{C}$ $T_c=125^\circ\text{C}$ $T_c=155^\circ\text{C}$	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	45* 27*	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Wave}$	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	86* 75*	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Wave}$	Fig. 8
I_{FMax}	Non-Repetitive Peak Forward Surge Current	1250* 1100*	A	$T_c=25^\circ\text{C}, t_p=10\text{ }\mu\text{s, Pulse}$ $T_c=110^\circ\text{C}, t_p=10\text{ }\mu\text{s, Pulse}$	Fig. 8
P_{tot}	Power Dissipation	116* 50*	W	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	Fig. 4
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

* Per Leg, ** Per Device

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.27* 1.37*	1.50* 1.60*	V	$I_F = 10\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 10\text{ A}$ $T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	2* 12*	50* 200*	μA	$V_R = 650\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 650\text{ V}$ $T_J = 175^\circ\text{C}$	Fig. 2
Q_C	Total Capacitive Charge	35*		nC	$V_R = 400\text{ V}$, $T_J = 25^\circ\text{C}$	Fig. 5
C	Total Capacitance	611* 67* 53*		pF	$V_R = 0\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 200\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 400\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$	Fig. 6
E_C	Capacitance Stored Energy	5.2*		μJ	$V_R = 400\text{ V}$	Fig. 7

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.29* 0.64**	$^\circ\text{C/W}$	Fig. 9

*Per Leg, ** Per Device

Typical Performance (Per Leg)

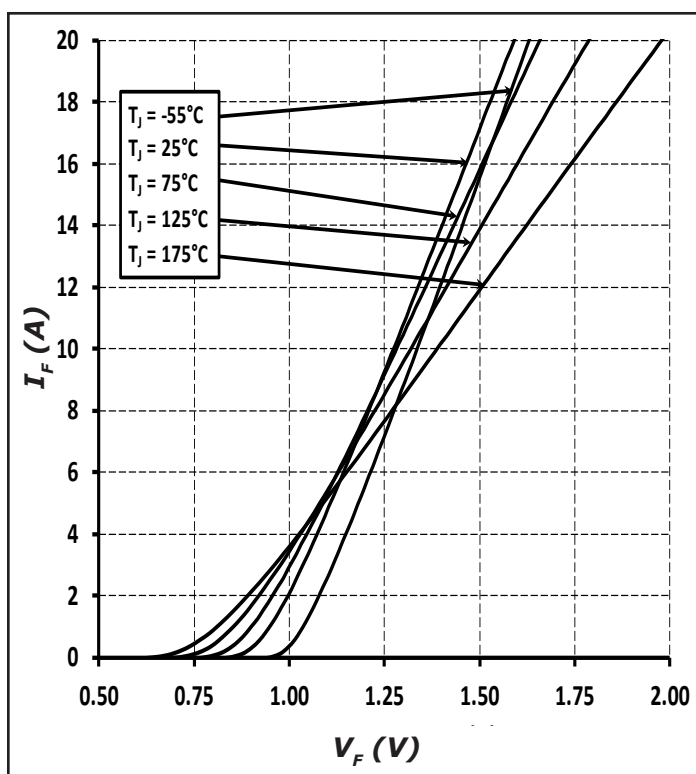


Figure 1. Forward Characteristics

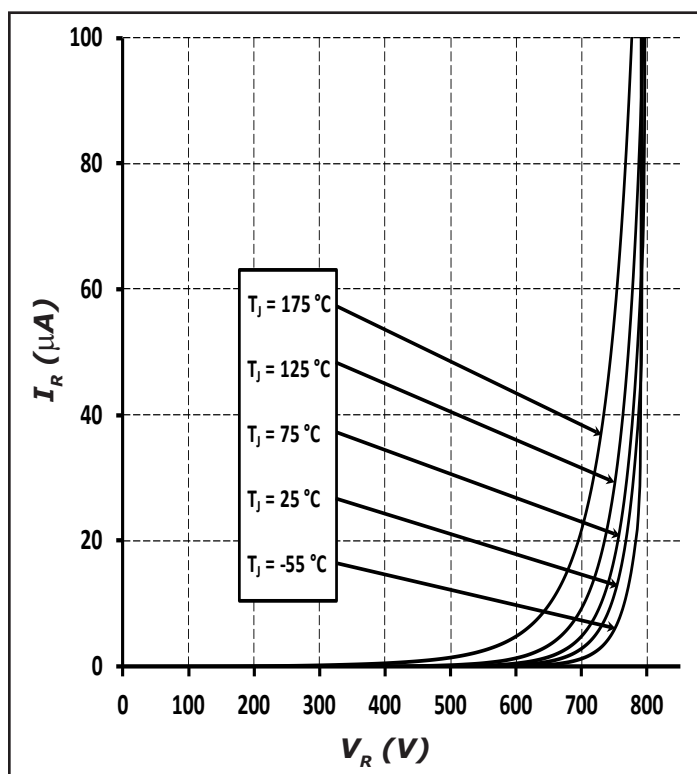


Figure 2. Reverse Characteristics

Typical Performance

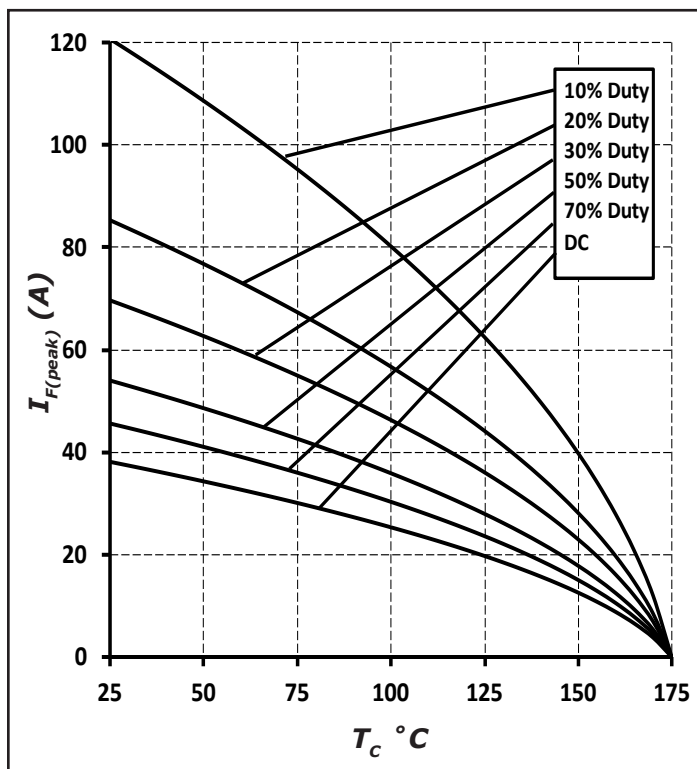


Figure 3. Current Derating

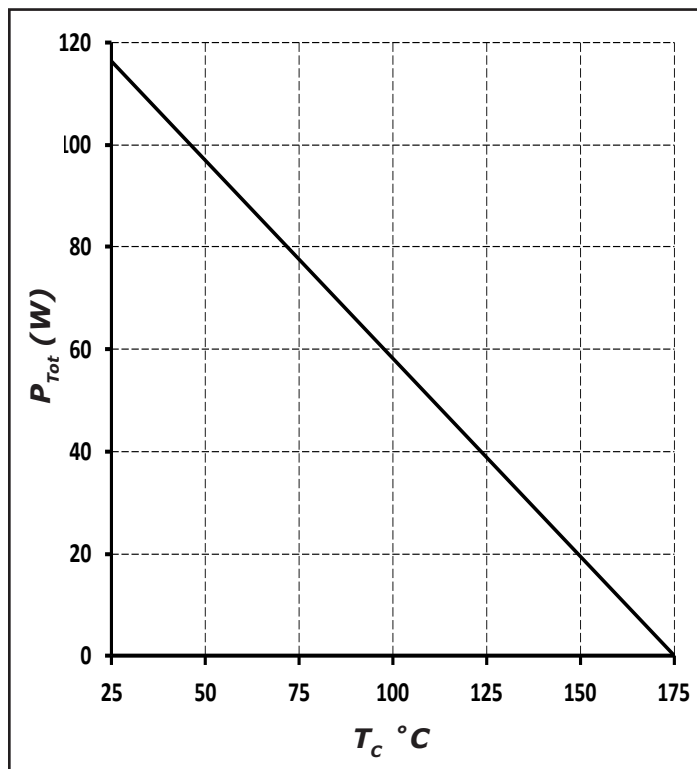


Figure 4. Power Derating

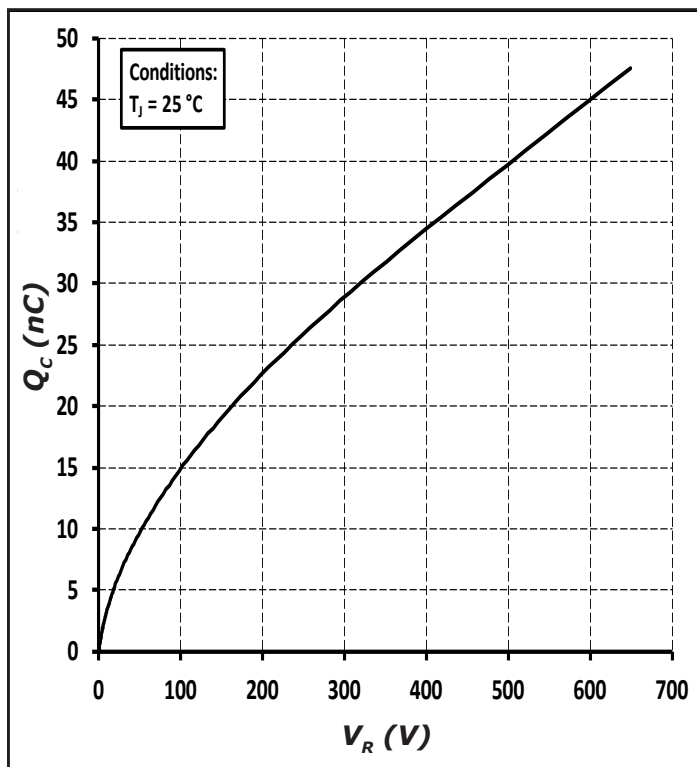


Figure 5. Total Capacitance Charge vs. Reverse Voltage

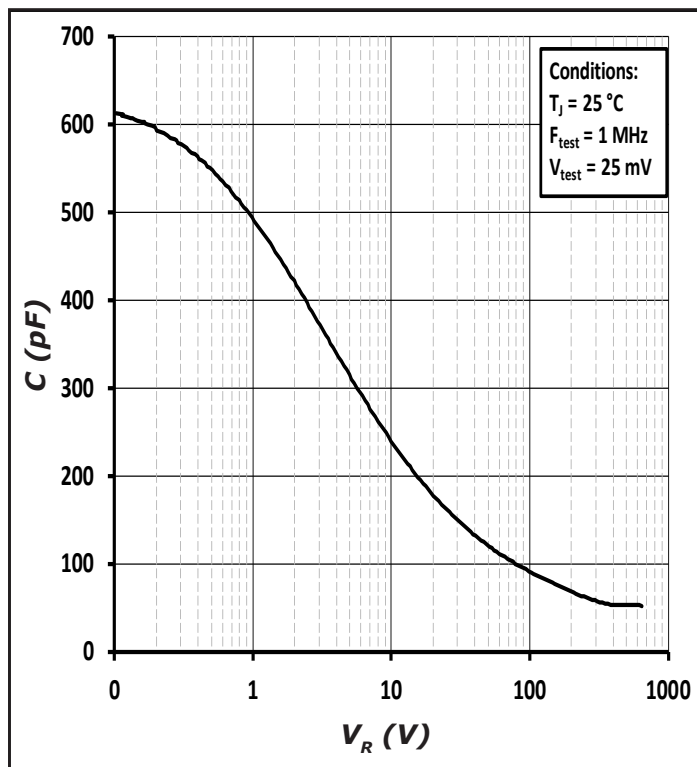


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

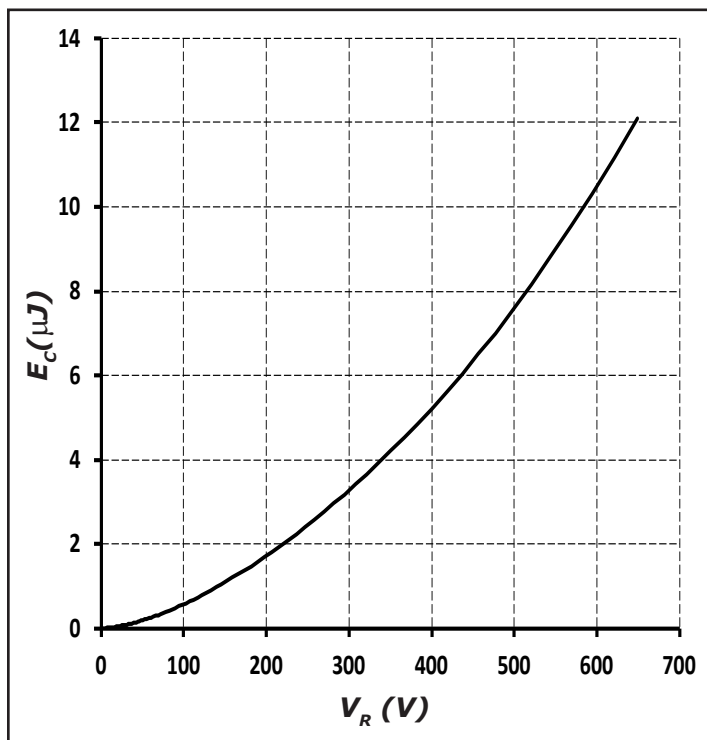


Figure 7. Capacitance Stored Energy

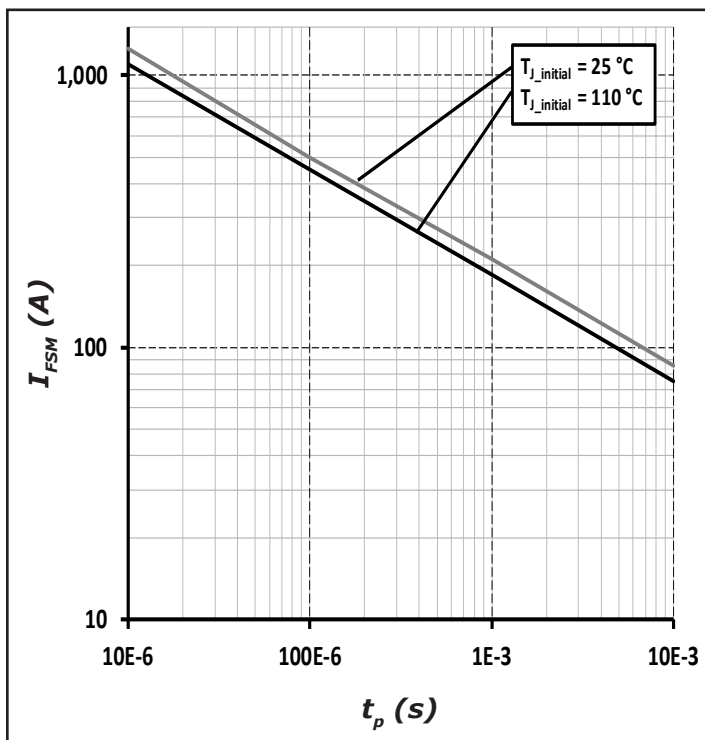


Figure 8. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

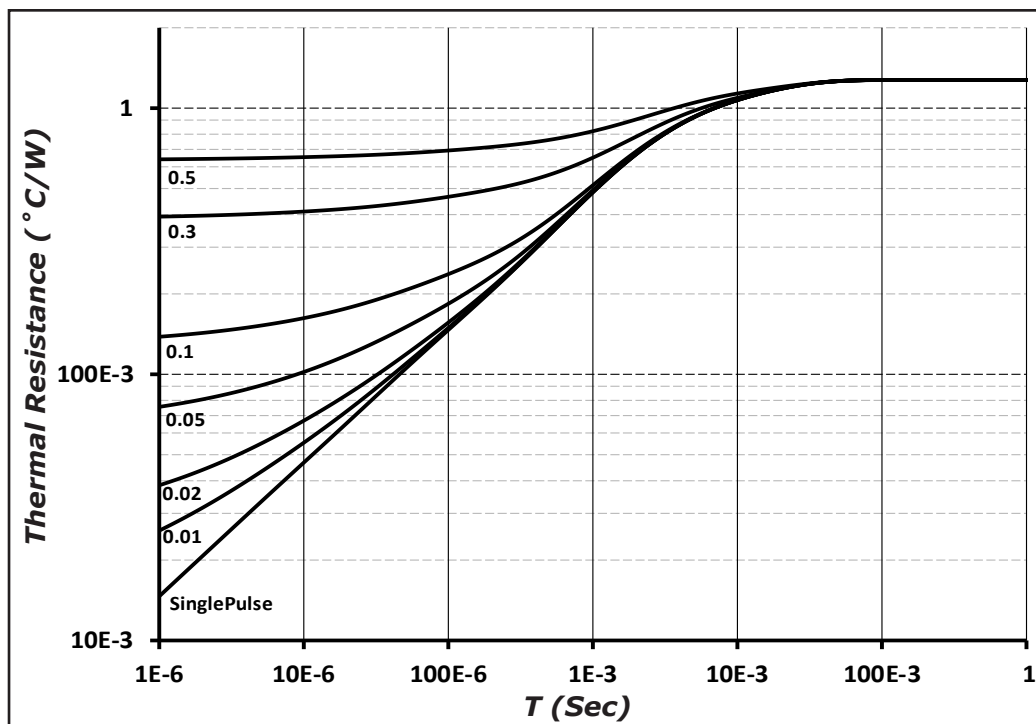
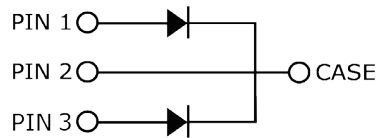
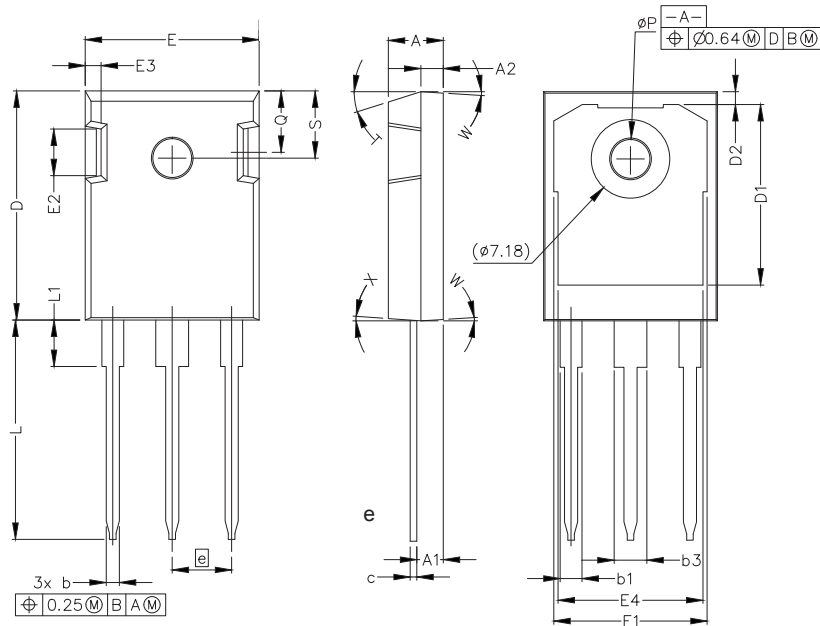


Figure 9. Transient Thermal Impedance

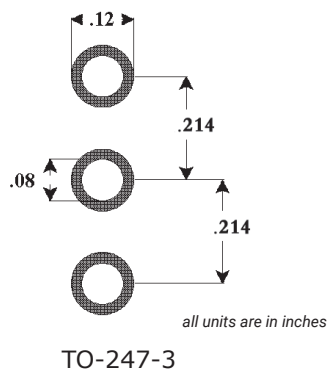
Package Dimensions

Package TO-247-3



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b3	.113	.133	2.87	3.38
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.557	13.10	14.15
E2	.145	.201	3.68	5.10
E3	.039	.075	1.00	1.90
E4	.487	.529	12.38	13.43
e	.214 BSC		5.44 BSC	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
N	3			
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
T	17.5° REF			
W	3.5° REF			
X	4° REF			

Recommended Solder Pad Layout



Part Number	Package	Marking
C6D20065D	TO-247-3	C6D20065