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PCRA49411K6
KGD Stealth Rectifier
30A, 600V

Features

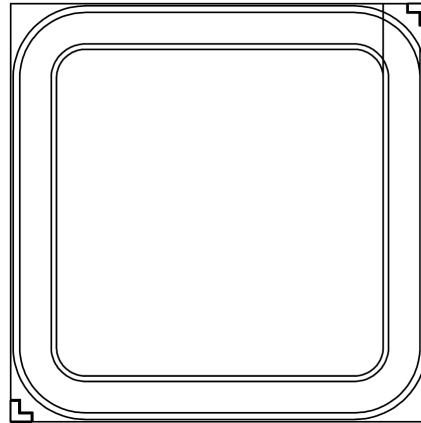
- High Speed Switching ($t_{rr}=31ns$ (Typ.) @ $I_F=30A$)
- Low Forward Voltage($V_F=2.4V$ (Max.) @ $I_F=30A$)
- Avalanche Energy Rated
- Qualified to AEC Q101

Applications

- Automotive DCDC converter
- Automotive On Board Charger
- Switching Power Supply
- Power Switching Circuits

Description

The PCRA49411K6 is Stealth™ diode optimized for low loss performance in high frequency hard switched applications. The Stealth™ family exhibits low reverse recovery current (IRRM) and exceptionally soft recovery under typical operating conditions. This device is intended for use as a freewheeling or boost diode in power supplies and other power switching applications. The low IRRM and short ta phase reduce loss in switching transistors. The soft recovery minimizes ringing, expanding the range of conditions under which the diode may be operated without the use of additional snubber circuitry. Consider using the Stealth™ diode with an SMPS IGBT to provide the most efficient and highest power density design at lower cost.



Ordering Information

P/N	Package	Packing Method
PCRA49411K6	N/A, KGD	T&R

	mils	um
Die Size	160X160	4060X4060
Anode Attach Area	122X122	3100X3100
Die Thickness	10+/-1	-

PCRA49411K6 KGD Stealth Rectifier

Absolute Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise Specified

Symbol	Parameter	Ratings	Units
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 25^\circ\text{C}$	30	A
I_{FSM}	Non-repetitive Peak Surge Current (Halfwave 1 Phase 50Hz)	90	A
E_{AVL}	Avalanche Energy (1A, 40mH)	20	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature	- 55 to +175	$^\circ\text{C}$

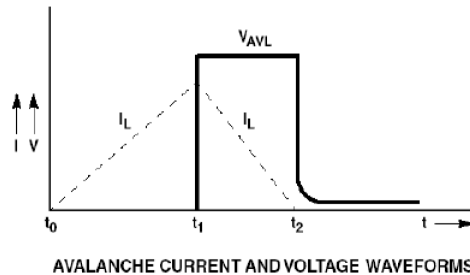
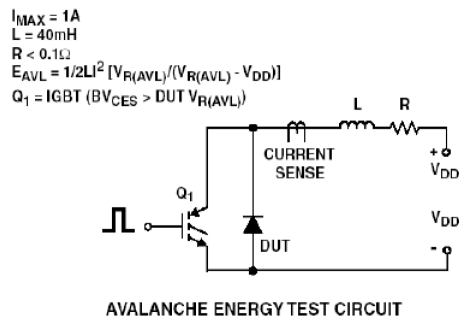
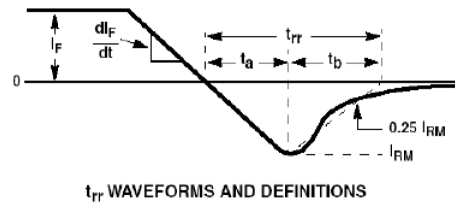
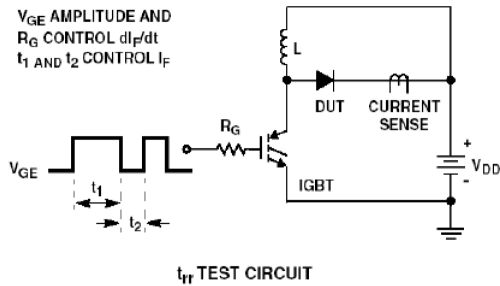
Electrical Characteristics $T_J = 25^\circ\text{C}$, Reference to TO220 unless otherwise noted (Singulated Die)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units	
I_R	Instantaneous Reverse Current	$V_R = 600\text{V}$	$T_C = 25^\circ\text{C}$	-	-	100	μA
			$T_C = 175^\circ\text{C}$	-	-	2	mA
V_{FM}^1	Instantaneous Forward Voltage	$I_F = 30\text{A}$	$T_C = 25^\circ\text{C}$	-	2.0	2.4	V
			$T_C = 175^\circ\text{C}$	-	1.5	2.2	V
t_{rr}^2	Reverse Recovery Time	$I_F = 1\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$	$T_C = 25^\circ\text{C}$	-	23	35	ns
		$I_F = 30\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$	$T_C = 25^\circ\text{C}$	-	31	45	ns
			$T_C = 175^\circ\text{C}$	-	135	-	ns
t_a	Reverse Recovery Time a	$I_F = 30\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$	$T_C = 25^\circ\text{C}$	-	18	-	ns
t_b	Reverse Recovery Time b			-	13	-	ns
Q_{rr}	Reverse Recovery Charge			-	48	-	nC
E_{AVL}	Avalanche Energy	$I_{AV} = 1.0\text{A}, L = 40\text{mH}$		20	-	-	mJ

Notes:

- 1: Pulse : Test Pulse width = 300 μs , Duty Cycle = 2%
- 2: Guaranteed by design

Test Circuit and Waveforms



Typical Characteristics

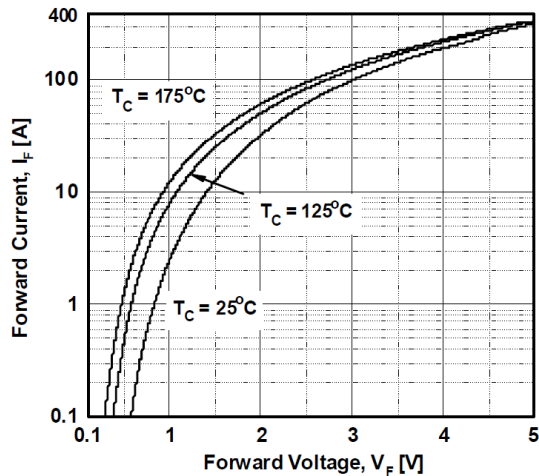


Figure 1. Typical Forward Voltage Drop vs. Forward Current

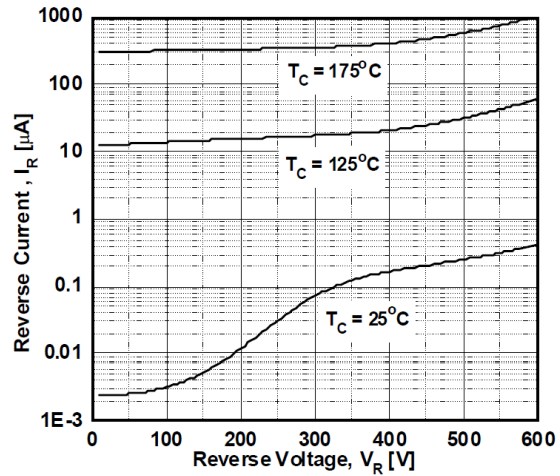


Figure 2. Typical Reverse Current vs. Reverse Voltage

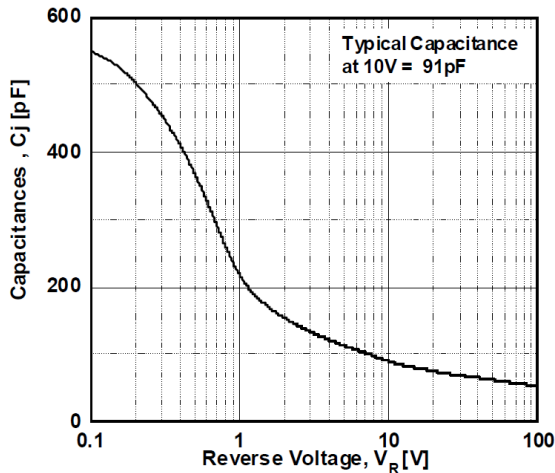


Figure 3. Typical Junction Capacitance

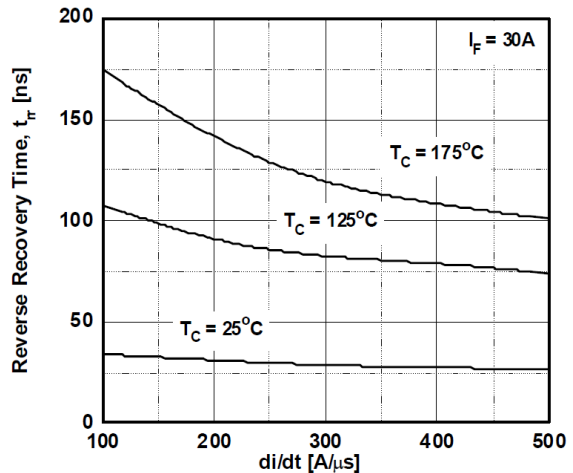


Figure 4. Typical Reverse Recovery Time vs. di/dt

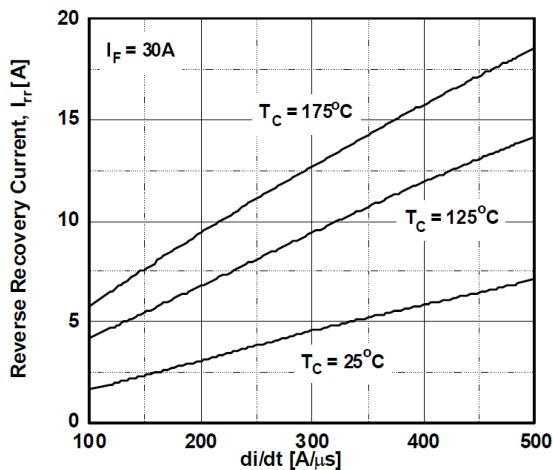


Figure 5. Typical Reverse Recovery Current vs. di/dt

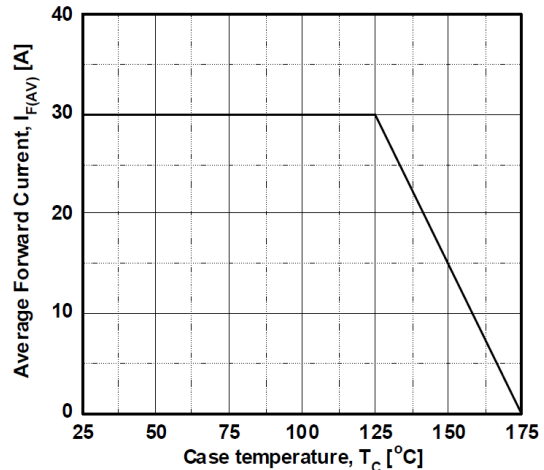


Figure 6. Forward Current Derating Curve

Typical Characteristics

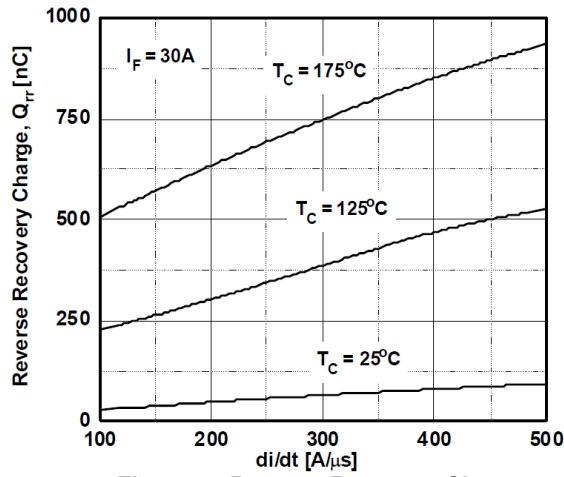


Figure 7. Reverse Recovery Charge

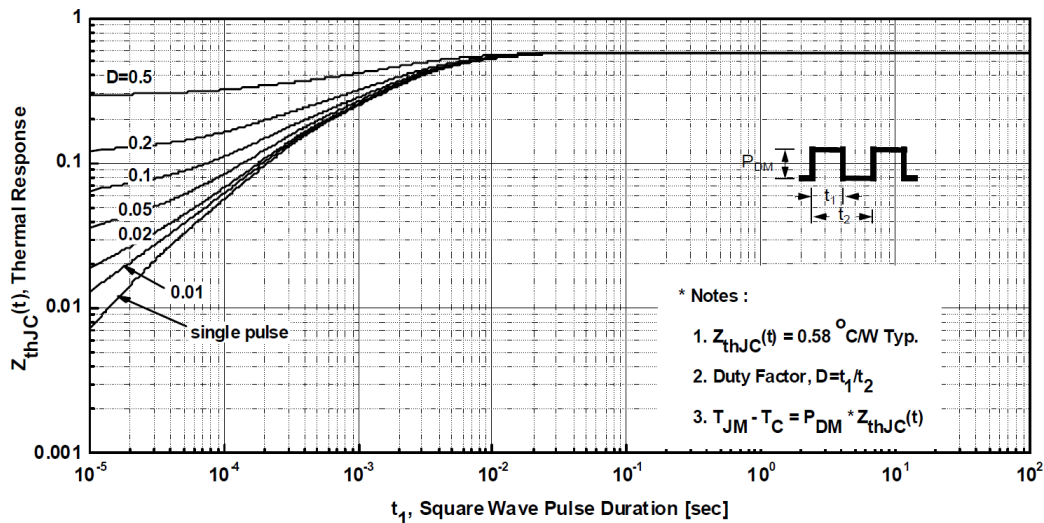







Figure 8. Transient Thermal Response Curve



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