

LGE3D10065A

Silicon Carbide Schottky Diode



Features

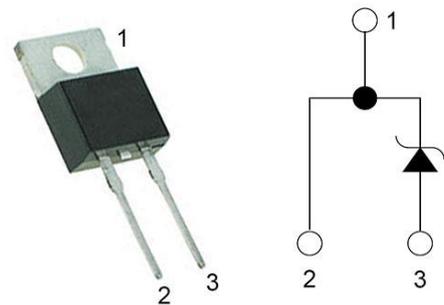
- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on V_F
- Temperature Independent Switching Behavior

$V_R = 650\text{ V}$
 $I_F = 10\text{ A (}T_C=150^\circ\text{C)}$
 $Q_C = 23\text{ nC (}V_R=400\text{V)}$

Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

TO-220AC



Applications

- Motor Drives
- Solar
- AC/DC Converters
- DC/DC Converters
- Uninterruptable Power Supplies

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

Parameter	Symbol	Test conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Peak Reverse Surge Voltage	V_{RSM}		650	V
DC Blocking Voltage	V_R		650	V
Continuous Forward Current	I_F	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=150^\circ\text{C}$	32 14 10	A
Non repetitive Forward Surge Current	I_{FSM}	$T_C = 25^\circ\text{C}$, $t_p=10\text{ ms}$, Half Sine Pulse $T_C = 150^\circ\text{C}$, $t_p=10\text{ ms}$, Half Sine Pulse $T_C = 25^\circ\text{C}$, $t_p=10\ \mu\text{s}$, Square	65 55 520	A
Repetitive peak Forward Surge Current	I_{FRM}	$T_C = 25^\circ\text{C}$, $t_p=10\text{ ms}$, Freq = 0.1Hz, 100 cycles, Half Sine Pulse $T_C = 150^\circ\text{C}$, $t_p=10\text{ ms}$, Freq = 0.1Hz, 100 cycles, Half Sine Pulse	55 45	A
Total power dissipation	P_D	$T_C=25^\circ\text{C}$	94	W
Operating Junction Temperature	T_J		-55 to 175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to 175	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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Electrical Characteristics

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC Blocking Voltage	V_{DC}	$I_R = 250\mu A, T_J = 25^\circ C$	650			V
Forward Voltage	V_F	$I_F = 10A, T_J = 25^\circ C$		1.45	1.8	V
		$I_F = 10A, T_J = 125^\circ C$		1.6		
		$I_F = 10A, T_J = 175^\circ C$		1.7		V
Reverse Current	I_R	$V_R = 650V, T_J = 25^\circ C$		12	80	μA
		$V_R = 650V, T_J = 125^\circ C$		68		μA
		$V_R = 650V, T_J = 175^\circ C$		190		μA
Total Capacitive Charge	Q_C	$V_R = 400V$ $T_J = 25^\circ C$		23		nC
Total Capacitance	C	$V_R = 1V, T_J = 25^\circ C,$ Freq = 1MHz		380		pF
		$V_R = 200V, T_J = 25^\circ C,$ Freq = 1MHz		48		
		$V_R = 400V, T_J = 25^\circ C,$ Freq = 1MHz		31		

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

Thermal Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermal Resistance	$R_{th(j-c)}$	junction-case		1.6		$^\circ C/W$



Typical Electrical Curves

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Figure 1. Forward Characteristics

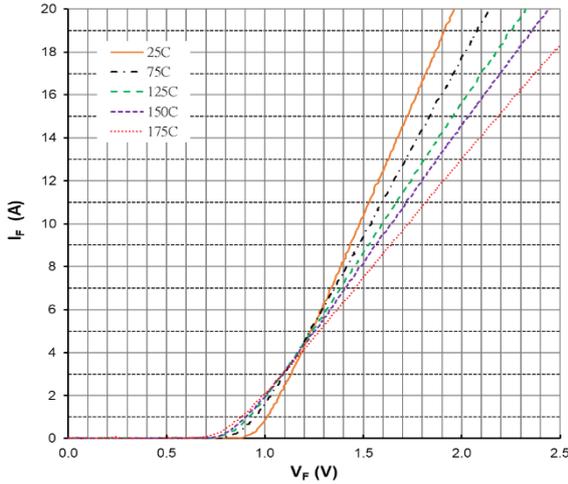


Figure 2. Forward Characteristics

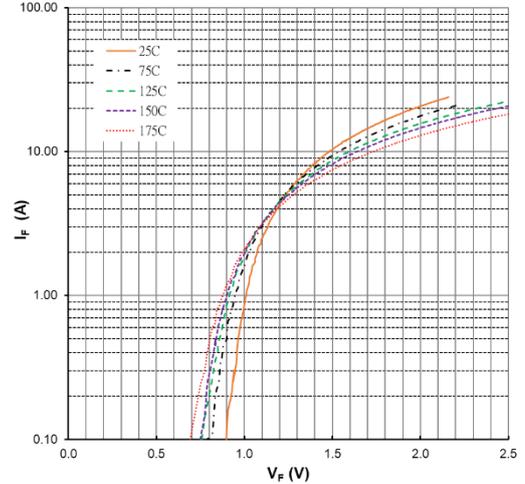


Figure 3. Reverse Characteristics

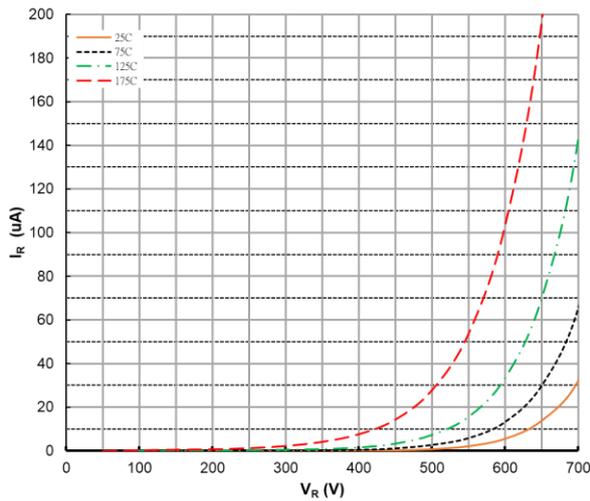


Figure 4. Power Derating

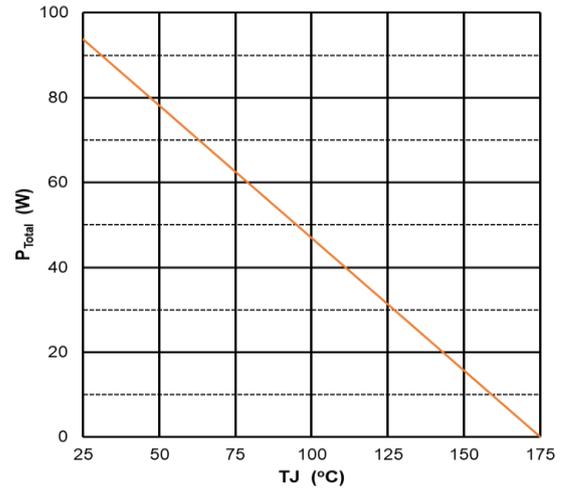


Figure 5. Capacitance vs Reverse Voltage

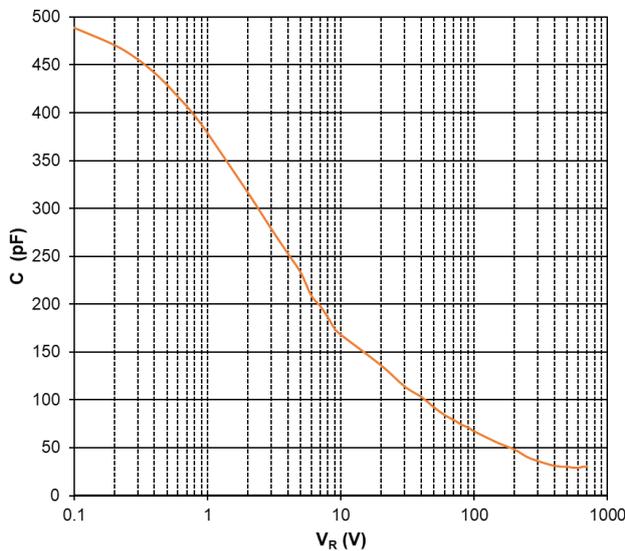
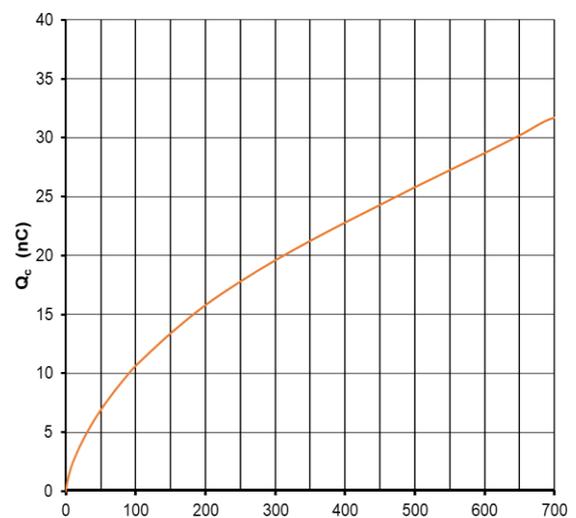


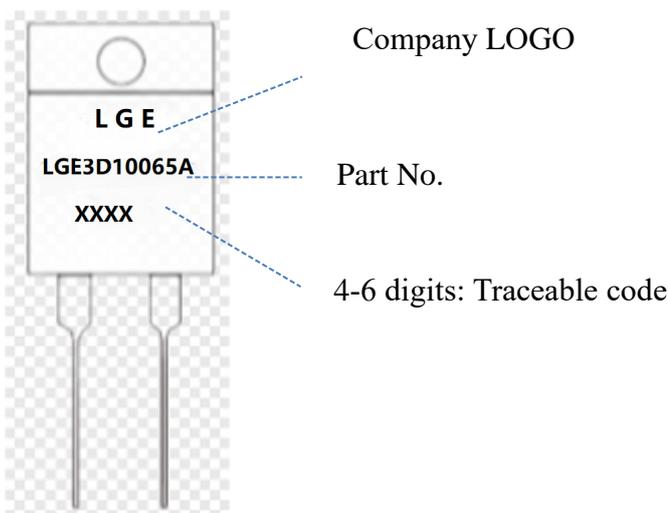
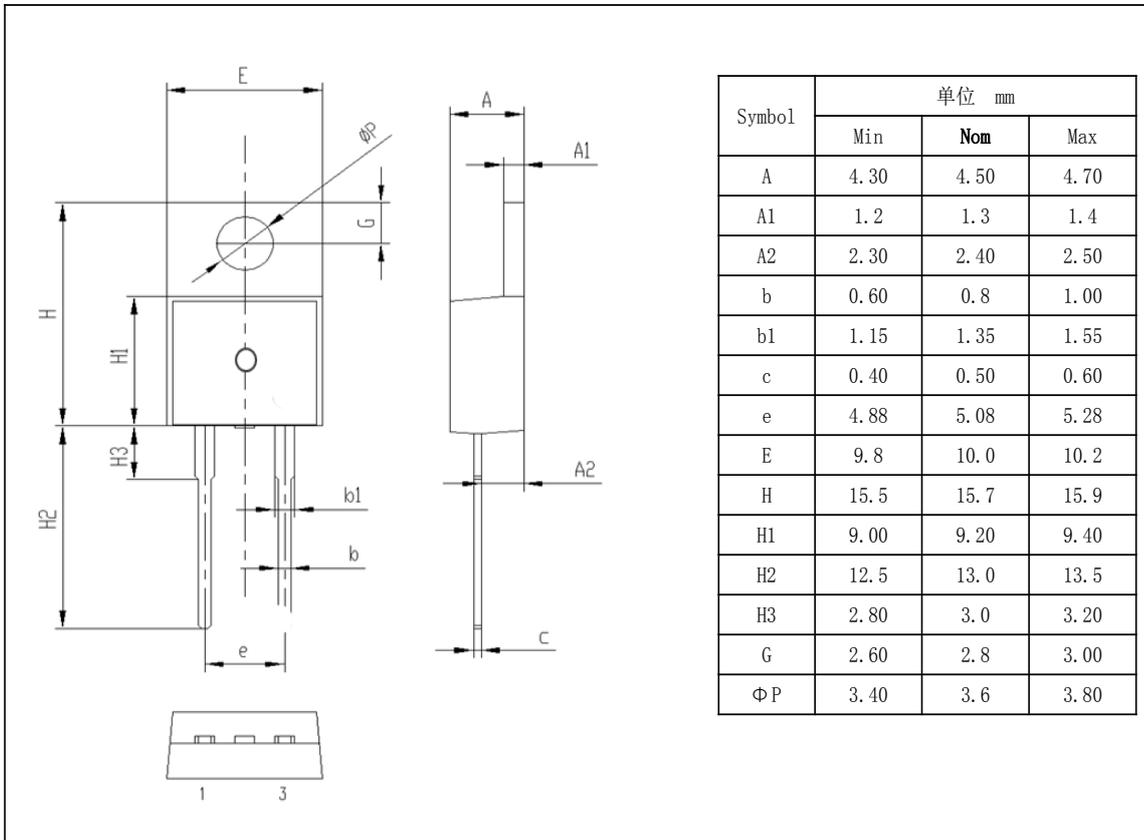
Figure 6. Recovery Charge vs Reverse Voltage





Package Dimensions

(TO-220AC Package)



Package	Packing	Box Size L×W×H(mm)	Quantity(pcs/box)	Carton Size L×W×H(mm)	Quantity(pcs/carton)
TO-220AC	50pcs/Tube	558×148×38	1000	565×225×175	5000