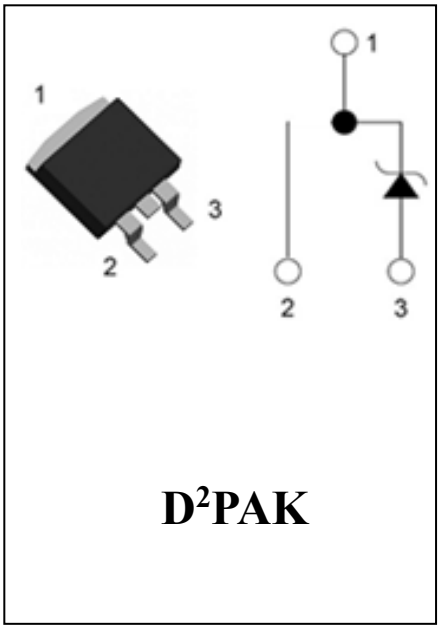
TK3D10065E

Silicon Carbide Schottky Diode

Product Summary

V_R = 650 V
I_F = 10A (T_C=150°C)
Qc = 23nC (V_R=400V)



Features

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

Benefits

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

Applications

- Motor Drives
- Solar
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

Ordering Information

Part Number	Package	Packing	Marking	Base Quantity
TK3D10065E	D²PAK	Tape & Reel	NF3D10065E	800

Maximum Ratings (T_C=25°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°C T_C=135°C T_C=150°C	32 14 10	A
Non repetitive Forward Surge Current	I_{FSM}	T_C = 25°C, t_p=10 ms, Half Sine Pulse T_C = 110°C, t_p=10 ms, Half Sine Pulse T_C = 25°C, t_p=10 μs, Square	65 55 520	A
Repetitive peak Forward Surge Current	I_{FRM}	T_C = 25°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse T_C = 110°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse	55 45	A
Total power dissipation	P_D	T_C=25°C	94	W
Operating Junction Temperature	T_J		-55 to 175	°C
Storage Temperature	T_{STG}		-55 to 175	°C

Electrical Characteristics

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC Blocking Voltage	V_{DC}	I_R = 250μA,T_J = 25°C	650			V
Forward Voltage	V_F	I_F = 10A, T_J = 25°C		1.45	1.8	V
		I_F = 10A, T_J = 125°C		1.6		
		I_F = 10A, T_J = 175°C		1.7		V
Reverse Current	I_R	V_R = 650V, T_J = 25°C		12	80	uA
		V_R = 650V, T_J = 125°C		68		uA
		V_R = 650V, T_J = 175°C		190		uA
Total Capacitive Charge	Q_C	V_R = 400V,I_F = 10A, di/dt = 200A/us, T_J = 25°C		23		nC
Total Capacitance	C	V_R = 1V, T_J = 25°C, Freq = 1MHz		380		pF
		V_R = 200V, T_J = 25°C, Freq = 1MHz		48		
		V_R = 400V, T_J = 25°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		^{0}C/W

Typical Electrical Curves

Figure 1. Forward Characteristics

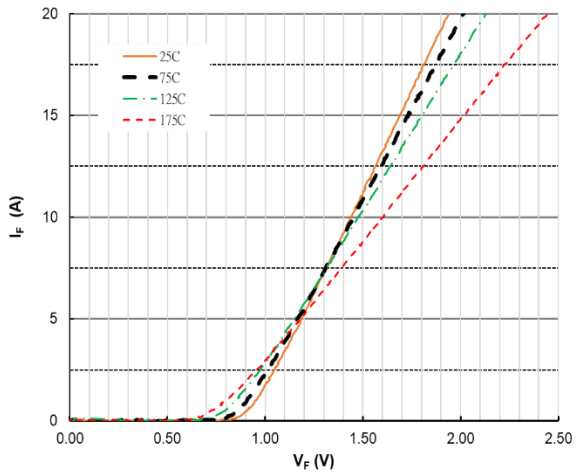


Figure 2. Forward Characteristics

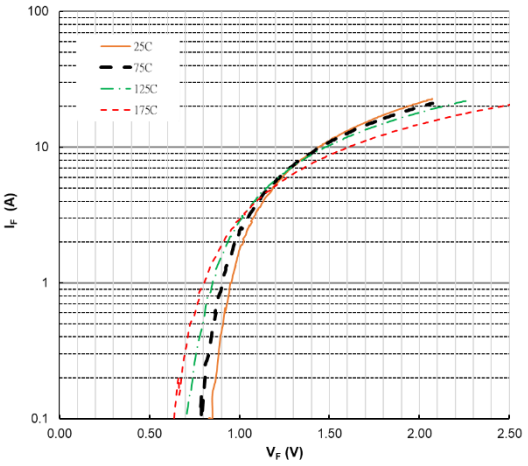


Figure 3. Reverse Characteristics

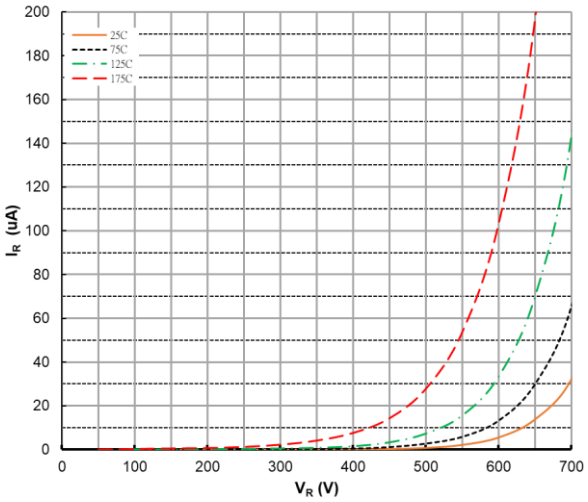


Figure 4. Power Derating

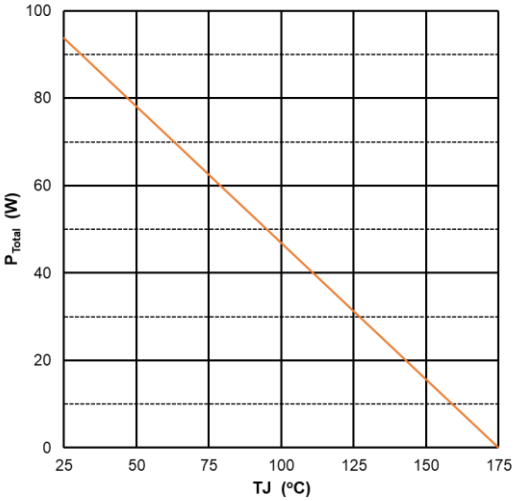


Figure 5. Capacitance vs Reverse Voltage

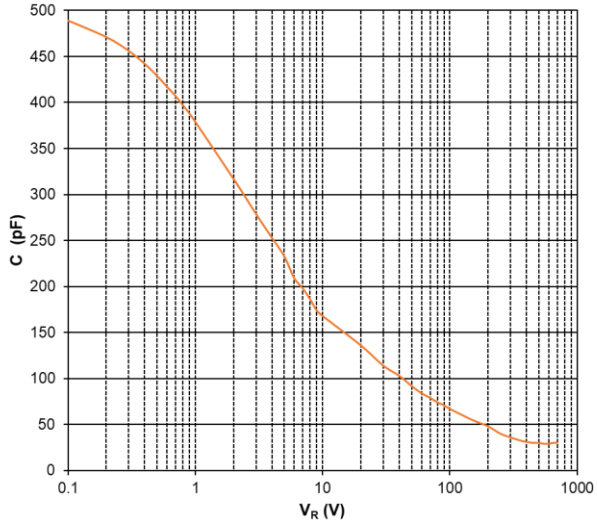
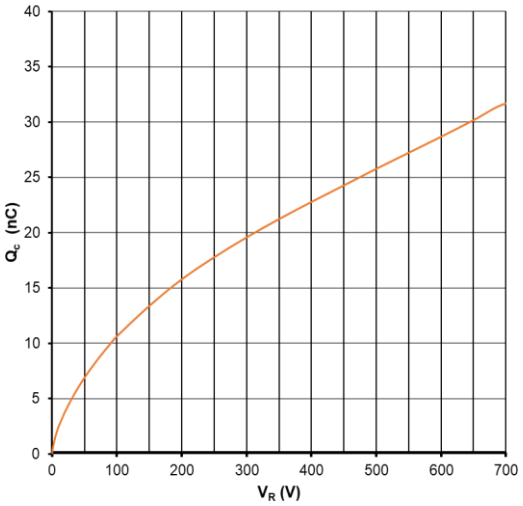
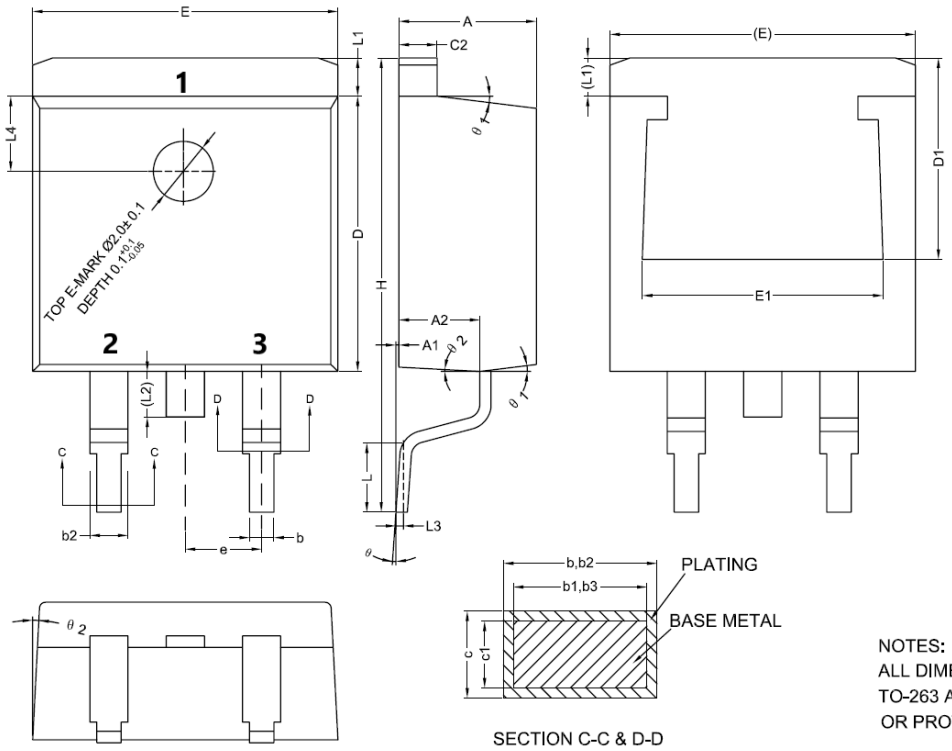


Figure 6. Recovery Charge vs Reverse Voltage



Package Dimensions

(D^2PAK Package)



SECTION C-C & D-D

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.40	4.57	4.70
A1	0	0.10	0.25
A2	2.59	2.69	2.79
b	0.77	-	0.90
b1	0.76	0.81	0.86
b2	1.23	-	1.36
b3	1.22	1.27	1.32
c	0.34	-	0.47
c1	0.33	0.38	0.43
c2	1.22	-	1.32
D	9.05	9.15	9.25
D1	6.60	-	-
E	10.06	10.16	10.26
E1	7.80	-	8.20
e		2.54BSC	
H	14.70	15.10	15.50
L	2.00	2.30	2.60
L1	1.17	1.27	1.40
L2	-	-	1.75
L3		0.25BSC	
L4		2.00REF	
θ	0°	-	8°
θ1	5°	7°	9°
θ2	1°	3°	5°

NOTES:
ALL DIMENSIONS REFER TO JEDEC STANDARD TO-263 AB DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.