H3S065X010

Part Number	Package	Marking
H3S065X010	TO-220-FP-2L	H3S065X010

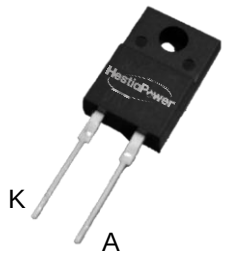
Product Summary

V_R	650V
$I_{F(110/135^\circ C)}$	13A/10A
Q_C	27.3nC

Features

- Low Conduction and Switching Loss
- Zero Reverse Recovery
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient Device
- High Surge Current Capability
- RoHS Compliant and Halogen Free
- Full Pack with Galvanic Isolation

Circuit Diagram



Benefits

- Higher System Efficiency
- Increase Parallel Device Convenience
- Enable High Temperature Application
- Allow High Frequency Operation
- Realize Compact and Lightweight Systems
- High Reliability

Applications

- Switching Mode Power Supply
- PFC
- UPS
- Motor Drives
- Flywheel diode in Power Inverters
- Solar/Wind Renewable Energy

Absolute Maximum Ratings (T_c = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	I_R = 100 μA	650	V
Peak Reverse Surge Voltage	V_{RSM}	T_J = 25°C	650	V
DC Blocking Voltage	V_R	T_J = 25°C	650	V
Continuous Forward Current	I_F	T_C = 25°C	22	A
		T_C = 110°C	13	
		T_C = 135°C	10	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	T_C = 25°C, T_P = 10 ms, Half Sine Wave	85	A
		T_C = 125°C, T_P = 10 ms, Half Sine Wave	75	
		T_C = 25°C, T_P = 10 μs, Pulse	687	
Repetitive Peak Forward Surge Current	I_{FRM}	T_C = 25°C, T_P = 10 ms Half Sine Wave, D = 0.1	67	A
		T_C = 125°C, T_P = 10 ms Half Sine Wave, D = 0.1	57	
Power Dissipation	P_D	T_C = 25°C	60	W
		T_C = 125°C	20	
I^2t value	$\int i^2dt$	T_C = 25°C, T_P = 10 ms	36	A^2s
Junction & Storage Temperature	T_j, T_{stg}		-55 to 175	°C
Soldering Temperature	T_L		260	
Mounting Torque	M_D	M3 or 6-32 screw	1.0	Nm

Electrical Characteristics (T_c = 25˚C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	I_R = 100 µA, T_J = 25˚C	> 650			V
Forward Voltage	V_F	I_F = 10A, T_J = 25˚C		1.42	1.7	V
		I_F = 10A, T_J = 175˚C		1.63	1.9	V
Reverse Current	I_R	V_R = 650V, T_J = 25˚C		1.5	75	µA
		V_R = 650V, T_J = 175˚C		20	300	µA
Total Capacitive Charge	Q_C	I_F = 10A, dI/dt = 300A/µs, V_R = 400V, T_J = 25˚C		27.3		nC
Total Capacitance	C_j	V_R = 1V, T_J=25˚C, f = 1 MHz V_R = 200V, T_J=25˚C, f = 1 MHz V_R = 400V, T_J=25˚C, f = 1 MHz		461 57 48		pF
Capacitance Stored Energy	E_C	V_R=400V		5.3		µJ

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$		2.5		˚C/W
Thermal Resistance, Junction to Ambient	$R_{\theta,JA}$				˚C/W

Naming Rule

H3 S 065 X 010

Generation
H3 = Gen 3rd Discrete

Device Type
M = MOSFET J = JMOS S = JBS diode

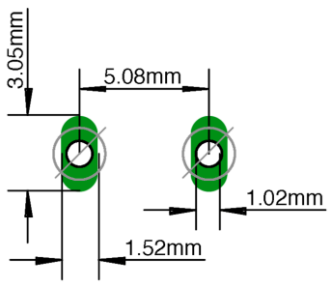
Breakdown Voltage
065 = 650V 120 = 1200V 170 = 1700V

Package
X = TO-220-FP-2L

Typical Current Rating
002 = 2A 004 = 4A 006 = 6A 008 = 8A 010 = 10A 015 = 15A

Recommended Solder Pad Layout

TO-220-FP-2L



Typical Device Performance

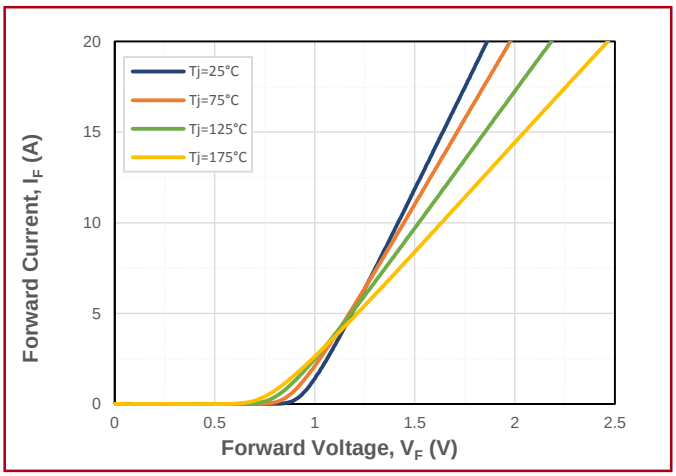


Fig.1 Forward Characteristics

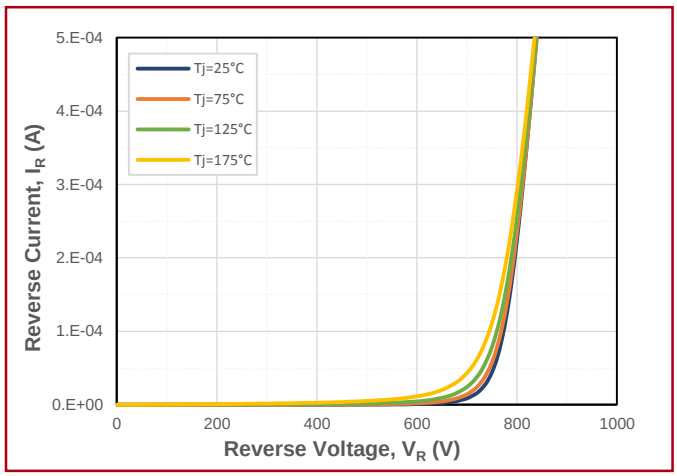


Fig.2 Reverse Characteristics

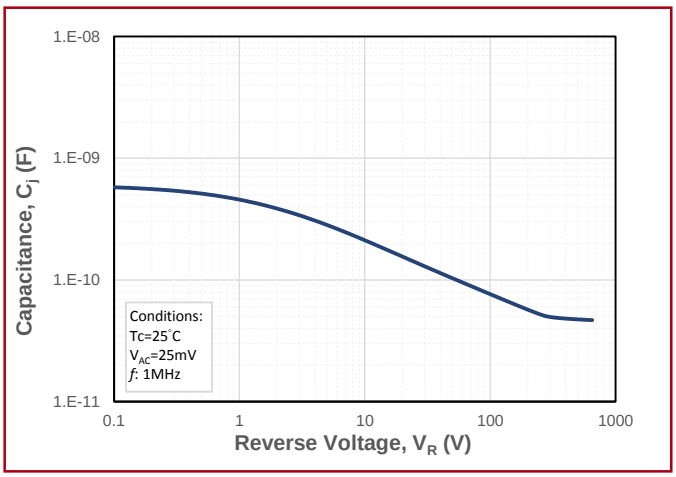


Fig.3 Junction Capacitance vs. Reverse Voltage

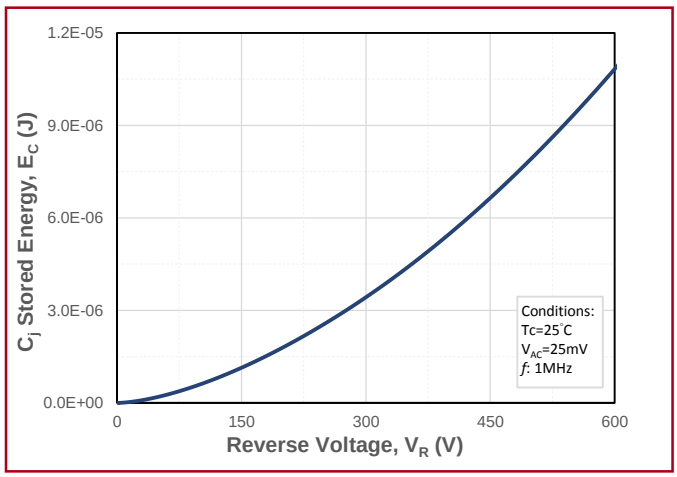


Fig.4 Capacitance Stored Energy

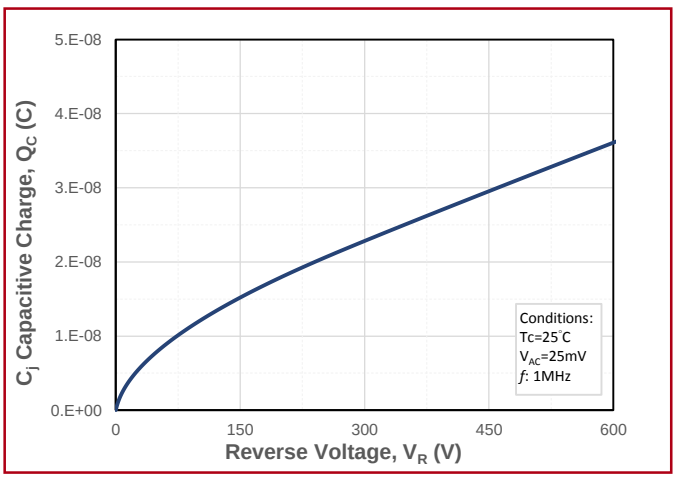


Fig.5 Recovery Charge vs. Reverse Voltage

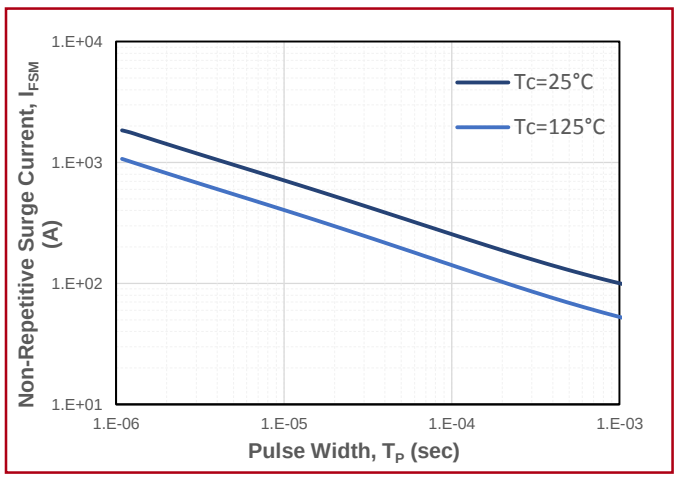


Fig.6 Non-Repetitive Peak Forward Surge Current (Pulse Mode)

Typical Device Performance

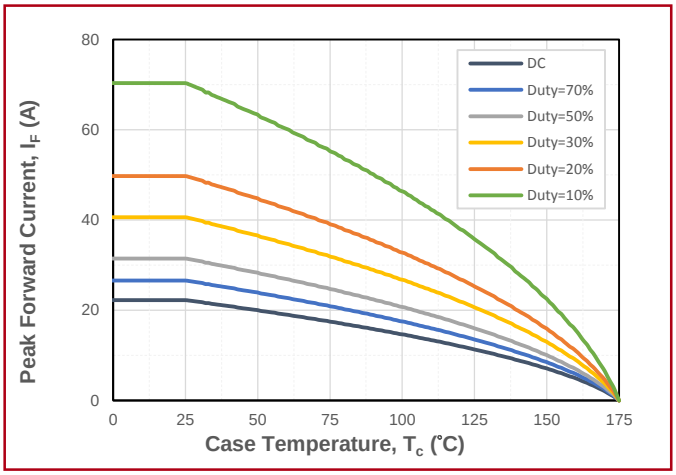


Fig.7 Maximum Forward Current Derating vs. Case Temperature

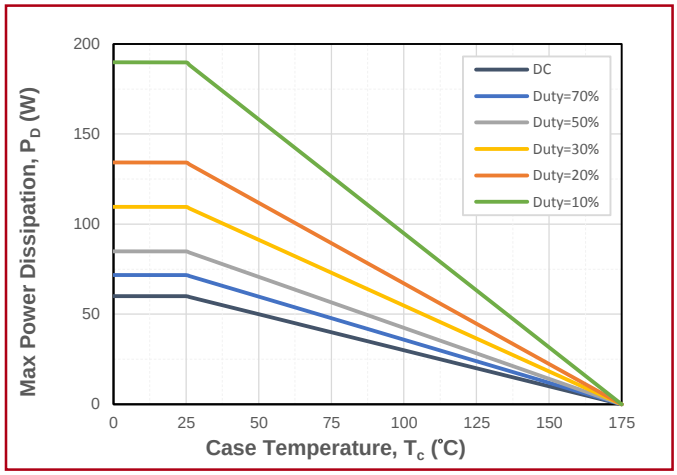


Fig.8 Maximum Power Dissipation Derating vs. Case Temperature

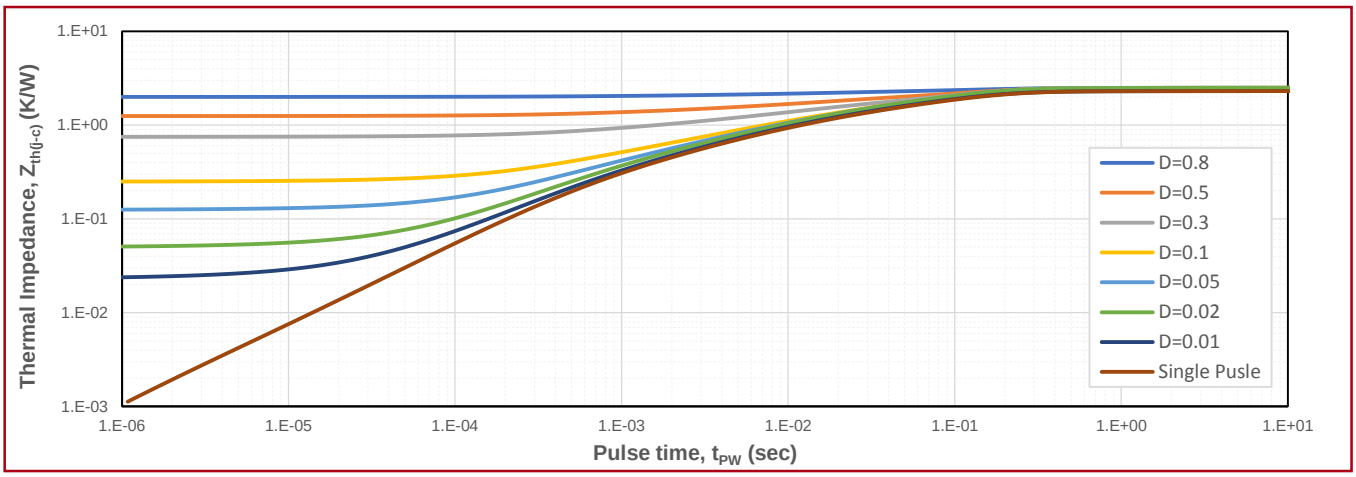
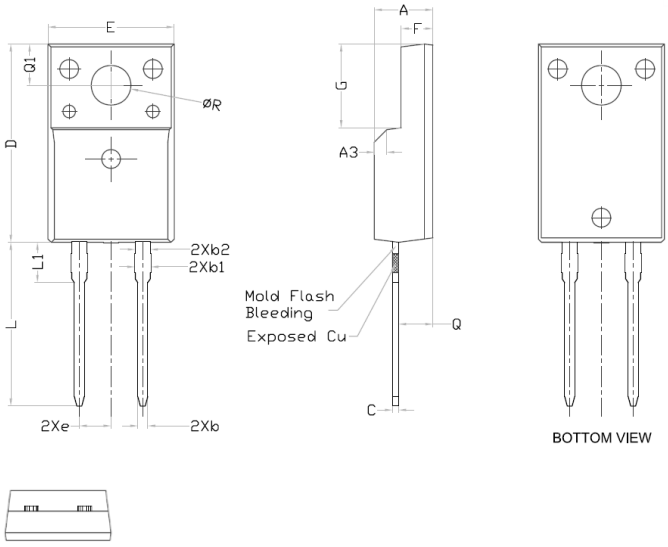


Fig.9 Transient Junction to Case Thermal Impedance

The information provided herein is subject to change without notice.

Package Dimensions (TO-220-FP-2L)



Note:
1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash And Burrs
   Mold Flash Should Be Less Than 6 Mil.

Symbol	mm		
	Min.	Typ.	Max.
A	4.60	4.70	4.80
b	0.70	0.80	0.91
b1	1.20	1.30	1.47
b2	1.10	1.20	1.30
C	0.45	0.50	0.63
D	15.80	15.87	15.97
e		2.54	
E	10.00	10.10	10.30
F	2.44	2.54	2.64
G	6.50	6.70	6.90
L	12.90	13.10	13.30
L1	3.13	3.23	3.33
Q	2.65	2.75	2.85
Q1	3.20	3.30	3.40
ϕR	3.08	3.18	3.28