

# H3S120W030R

Part Number	Package	Marking
H3S120W030R	T2PAK-7R	H3S120W030R

## Product Summary

$V_R$	1200V
$I_{F(135/145^\circ C)}$	36A/30A
$Q_C$	178nC



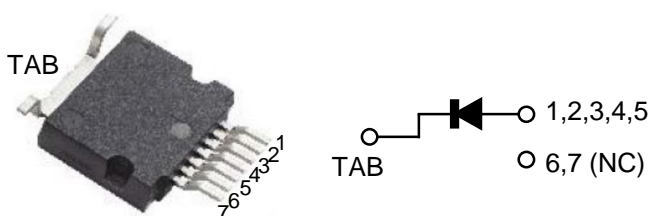
## Features

- 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
- Optimized for High Power Application

## Benefits

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

## Circuit Diagram



\* Reference only (ref: ST/HU3PAK)

## Applications

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

## Absolute Maximum Ratings ( $T_C = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	$T_J = 25^\circ C$	1200	V
Peak Reverse Surge Voltage	$V_{RSM}$	$T_J = 25^\circ C$	1200	V
DC Blocking Voltage	$V_R$	$T_J = 25^\circ C$	1200	V
Continuous Forward Current	$I_F$	$T_C = 25^\circ C$	79*	A
		$T_C = 135^\circ C$	36*	
		$T_C = 145^\circ C$	30*	
Non-Repetitive Peak Forward Surge Current	$I_{FSM}$	$T_C = 25^\circ C, T_P = 10 \text{ ms, Half Sine Wave}$	229*	A
		$T_C = 125^\circ C, T_P = 10 \text{ ms, Half Sine Wave}$	201*	
		$T_C = 25^\circ C, T_P = 10 \mu s, \text{ Pulse}$	2776*	
Repetitive Peak Forward Surge Current	$I_{FRM}$	$T_C = 25^\circ C, T_P = 10 \text{ ms, Half Sine Wave, } D = 0.1$	177*	A
		$T_C = 125^\circ C, T_P = 10 \text{ ms, Half Sine Wave, } D = 0.1$	138*	
Power Dissipation	$P_D$	$T_C = 25^\circ C$	263*	W
		$T_C = 125^\circ C$	87*	
$I^2t$ value	$\int i^2 dt$	$T_C = 25^\circ C, T_P = 10 \text{ ms}$	262*	$A^2s$
Junction & Storage Temperature	$T_J, T_{stg}$		-55 to 175	$^\circ C$
Soldering Temperature	$T_L$		260	
Mounting Torque	$M_D$	M3 or 6-32 screw	1.0	Nm

\* By estimated

## Electrical Characteristics (T<sub>c</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V <sub>DC</sub>	I <sub>R</sub> = 500 μA, T <sub>J</sub> = 25 °C	> 1200			V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 30A, T <sub>J</sub> = 25 °C		1.45	1.7	V
		I <sub>F</sub> = 30A, T <sub>J</sub> = 175 °C		1.75	2.0	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 1200V, T <sub>J</sub> = 25 °C		3	600	μA
		V <sub>R</sub> = 1200V, T <sub>J</sub> = 175 °C		30	1000	μA
Total Capacitive Charge	Q <sub>C</sub>	V <sub>R</sub> = 800V, T <sub>J</sub> =25 °C		178		nC
Total Capacitance	C <sub>j</sub>	V <sub>R</sub> = 0.1V, T <sub>J</sub> =25 °C, f =1 MHz		2753		
		V <sub>R</sub> = 400V, T <sub>J</sub> =25 °C, f =1 MHz		191		pF
		V <sub>R</sub> = 800V, T <sub>J</sub> =25 °C, f =1 MHz		142		
Capacitance Stored Energy	E <sub>C</sub>	V <sub>R</sub> = 800V		71		μJ

## Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	R <sub>θ,JC</sub>		0.57*		°C/W

## Naming Rule

**H3 S 120 W 030 R**

### Generation

H3 = 3<sup>rd</sup> Gen Discrete

### Device Type

S = JBS diode (High Power)    D = JBS diode (High Speed)

### Breakdown Voltage

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

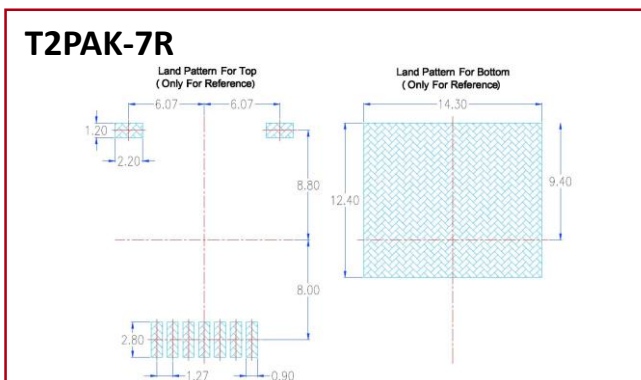
### Package

T = TO-263-2L    G = TO-247-2L    W = T2PAK-7R (R = top side cooling)

### Typical Current Rating

002 = 2A    005 = 5A    010 = 10A    020 = 20A    030 = 30A

## Recommended Solder Pad Layout



## Typical Device Performance

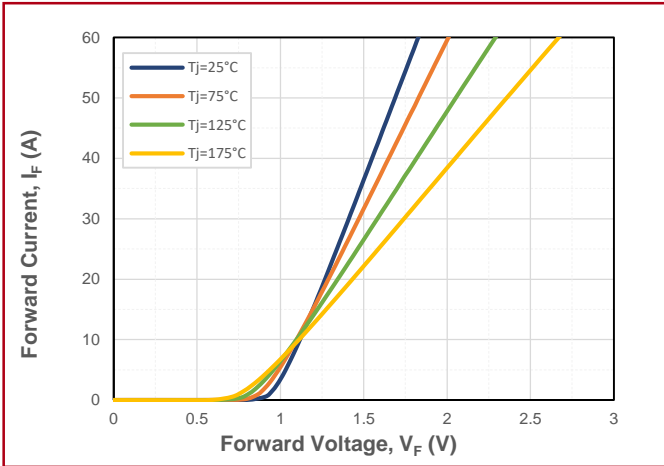


Fig.1 Forward Characteristics

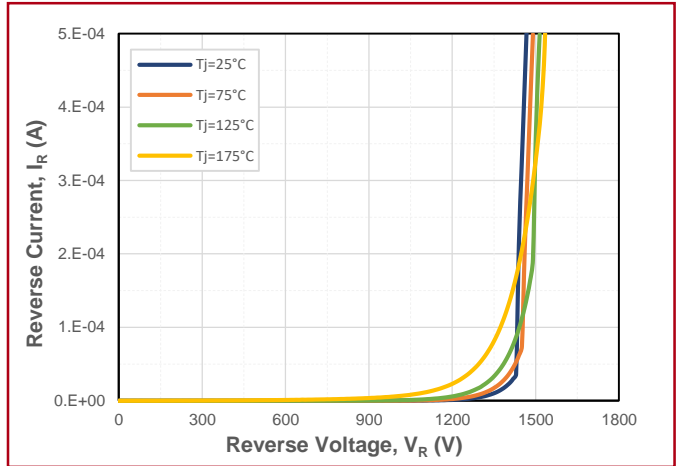


Fig.2 Reverse Characteristics

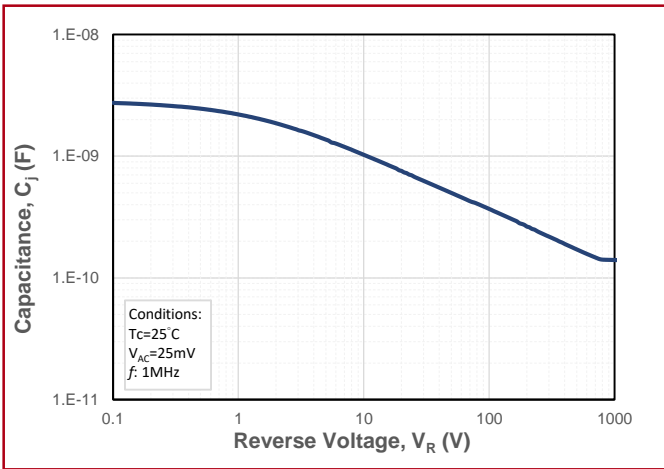


Fig.3 Junction Capacitance vs. Reverse Voltage

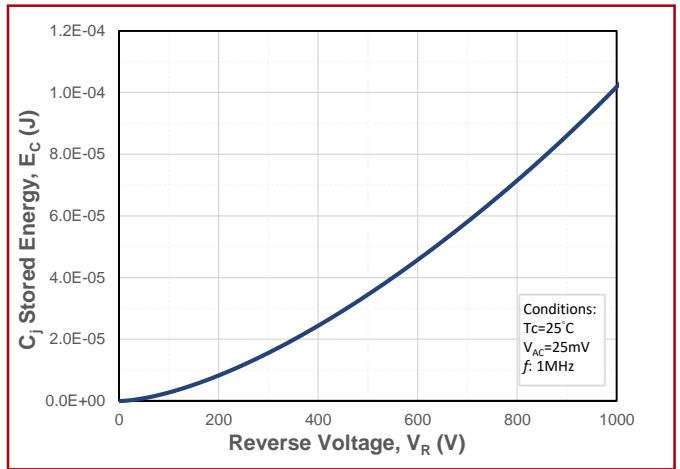


Fig.4 Capacitance Stored Energy

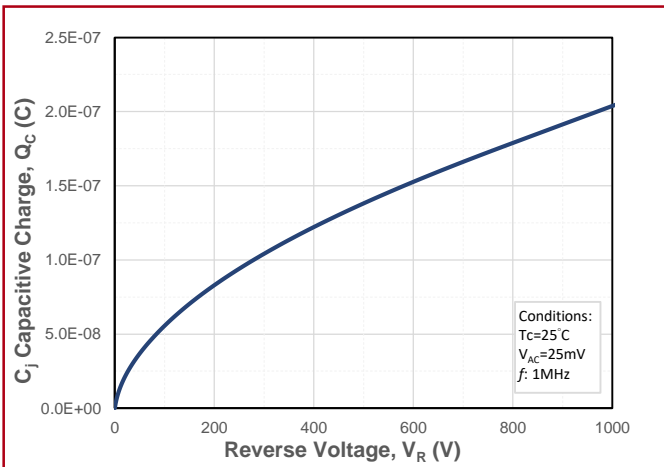


Fig.5 Recovery Charge vs. Reverse Voltage

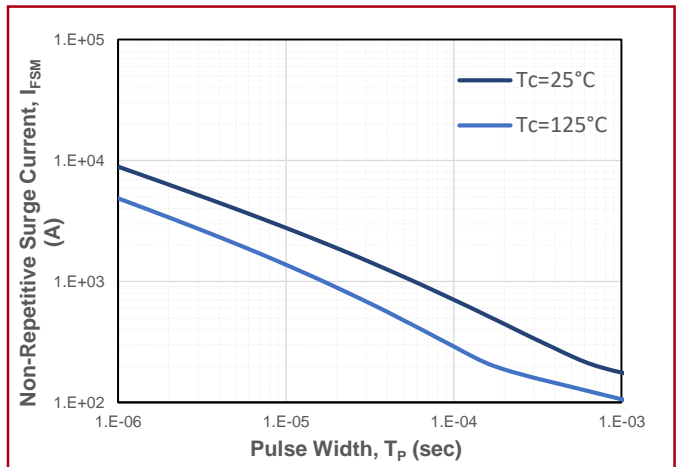
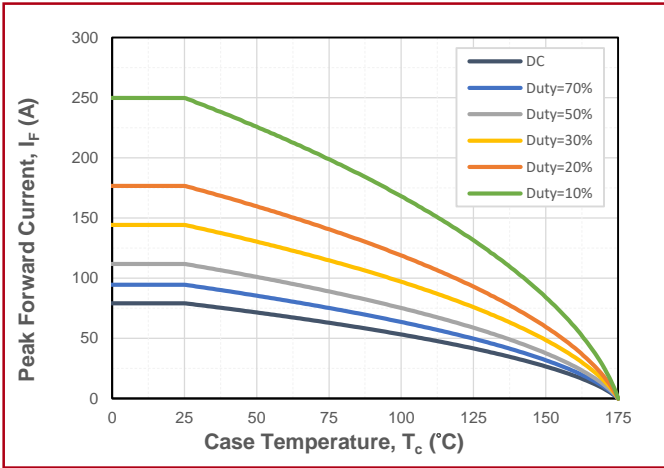
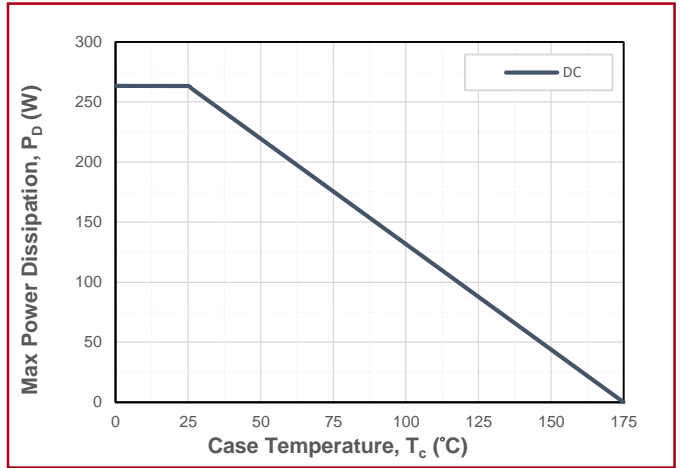


Fig.6 Non-Repetitive Peak Forward Surge Current (Pulse Mode)

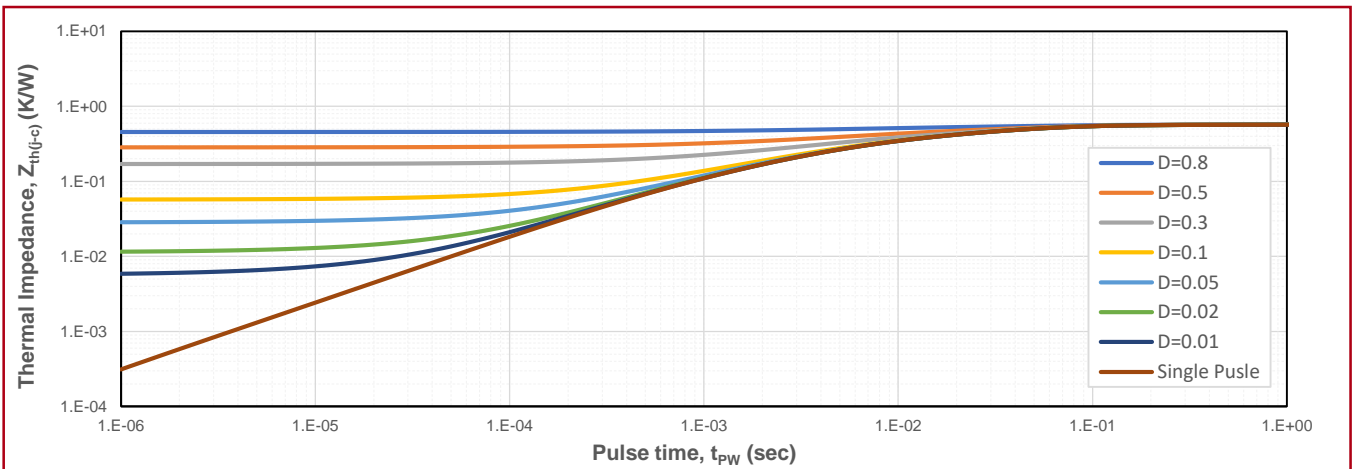
### Typical Device Performance



**Fig.7 Maximum Forward Current Derating vs. Case Temperature**

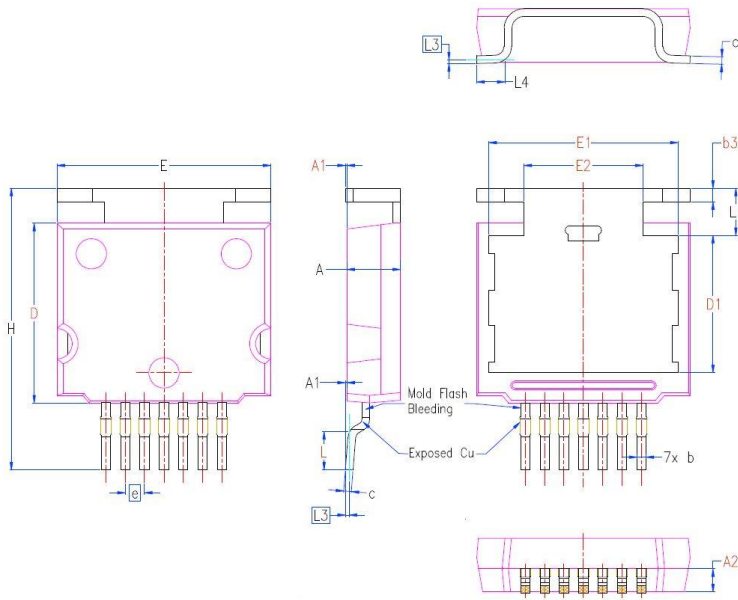


**Fig.8 Maximum Power Dissipation Derating vs. Case Temperature**



**Fig.9 Transient Junction to Case Thermal Impedance**

### Package Dimensions (T2PAK-7R)



Symbol	mm		
	Min.	Typ.	Max.
A	3.30	3.50	3.70
A1	---	0.10	0.25
A2	1.30	1.50	1.70
b	0.50	0.60	0.70
b3	0.80	0.90	1.00
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D	11.70	11.80	11.90
D1	8.80	9.00	9.20
E	13.60	14.00	14.40
E1	12.00	12.40	12.80
E2	7.60	7.80	8.00
e	1.27 BSC		
H	17.70	18.50	19.30
L	1.90	2.50	3.10
L1	2.85	3.10	3.35
L3	0.25 BSC		
L4	1.25	1.85	2.45

The information provided herein is subject to change without notice.