



## Description

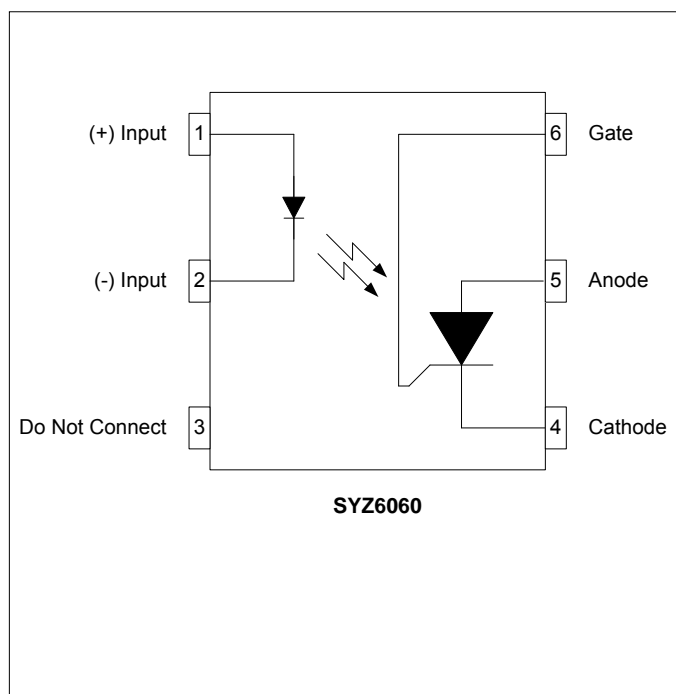
The SYZ6060 consists of a single input AlGaAs LED optically coupled to a photo-sensitive SCR. Optical coupling provides high isolation levels (up to 5kV<sub>RMS</sub>) while maintaining low-level DC signal control capability. With high load voltage and low input current, the SYZ6060 is an ideal solution for driving SCRs, Triacs and Solid State Relays.

The SYZ6060 comes standard in a compact 6 pin DIP package making it ideal for high-density board applications.

## Applications

- Home Appliances
- Motor / Drive Controls
- Solid State Relays
- Solenoid / Valve Controls
- Temperature Controls
- Dimmer Controls

## Schematic Diagram



## Features

- Low Input Control Current (5mA MAX)
- High Blocking Voltage (600V)
- 400mA Maximum Continuous Current
- High Isolation Voltage (up to 5kV<sub>RMS</sub>)
- High Transient Immunity (dV/dt = 400V/μS MIN)
- Long Life / High Reliability
- RoHS / Pb-Free / REACH Compliant

## Agency Approvals

UL/C-UL: File # E201932  
VDE: File # 40035191 (EN 60747-5-2)

## Absolute Maximum Ratings

The values indicated are absolute stress ratings. Functional operation of the device is not implied at these or any conditions in excess of those defined in electrical characteristics section of this document. Exposure to absolute Maximum Ratings may cause permanent damage to the device and may adversely affect reliability.

Storage Temperature .....	-55 to +125°C
Operating Temperature .....	-40 to +85°C
Continuous Input Current .....	50mA
Transient Input Current .....	400mA
Transient Output Current .....	10A
Reverse Input Control Voltage .....	5V
Input Power Dissipation .....	40mW
Output Power Dissipation .....	500mW
Solder Temperature – Wave (10sec) .....	260°C
Solder Temperature – IR Reflow (10sec) .....	260°C

## Ordering Information

Part Number	Description
SYZ6060	6 pin DIP, (60/Tube)
SYZ6060-H	5kV <sub>RMS</sub> V <sub>ISO</sub> , 6 pin DIP, (60/Tube)
SYZ6060-S	6 pin SMD, (60/Tube)
SYZ6060-HS	5kV <sub>RMS</sub> , 6 pin SMD, (60/Tube)
SYZ6060-STR	6 pin SMD, Tape and Reel (1000/Reel)
SYZ6060-HSTR	5kV <sub>RMS</sub> , 6 pin SMD, Tape and Reel (1000/Reel)

**NOTE: Suffixes listed above are not included in marking on device for part number identification**

**Electrical Characteristics,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**

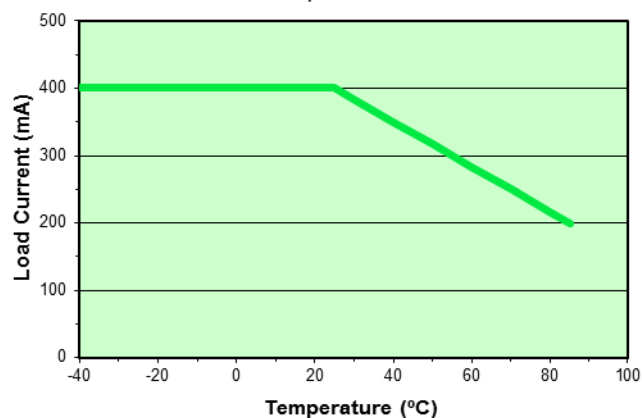
Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Specifications</b>						
LED Forward Voltage	$V_F$	-	1.2	1.5	V	$I_F = 10\text{mA}$
LED Reverse Voltage	$BV_R$	5	-	-	V	$I_R = 10\mu\text{A}$
Reverse Leakage Current	$I_{\text{InRleak}}$	-	-	10	$\mu\text{A}$	$V_R = 5\mu\text{A}$
Trigger (Must Operate) Current <sup>1</sup>	$I_{\text{InOn}}$	-	2.5	5	mA	$I_O = 400\text{mA}$
<b>Output Specifications</b>						
Forward Blocking Voltage	$V_{DM}$	600	-	-	V	$R_{GK}=10\text{k}\Omega$ , $T_A=100^\circ\text{C}$ , $I_D=150\mu\text{A}$
Reverse Blocking Voltage	$V_{RM}$	600	-	-	V	$R_{GK}=10\text{k}\Omega$ , $T_A=100^\circ\text{C}$ , $I_R=150\mu\text{A}$
Continuous Load Current	$I_{DM}$	-	-	400	mA	$I_F = 5\text{mA}$
Transient Surge Current	$I_{DM}(\text{PEAK})$	-	-	10	A	$T = 16\mu\text{S}$
On-State Voltage	$V_{TM}$	-	1.1	1.4	V	$I_F = 5\text{mA}$ , $I_{DM} = 400\text{mA}$
Forward Leakage Current	$I_{DM}$	-	1	10	$\mu\text{A}$	$R_{GK}=10\text{k}\Omega$ , $T_A=100^\circ\text{C}$ , $V_{DM}=600\text{V}$ , $I_F=0$
Reverse Leakage Current	$I_{RM}$	-	1	10	$\mu\text{A}$	$R_{GK}=10\text{k}\Omega$ , $T_A=100^\circ\text{C}$ , $V_{RM}=600\text{V}$ , $I_F=0$
Gate Trigger Voltage	$V_{GT}$	-	0.6	1	V	$V_{FX}=100\text{V}$ , $R_{GK}=27\text{k}\Omega$ , $R_L=10\text{k}\Omega$
Gate Trigger Current	$I_{GT}$	-	20	50	$\mu\text{A}$	$V_{FX}=100\text{V}$ , $R_{GK}=27\text{k}\Omega$ , $R_L=10\text{k}\Omega$
Critical Rate of Rise <sup>2</sup>	$dV/dt$	400	-	-	V/ $\mu\text{S}$	-
<b>Isolation Specifications</b>						
Isolation Voltage (-H Option)	$V_{ISO}$	3750			$V_{RMS}$	$RH \leq 50\%$ , $t=1\text{min}$
		5000	-	-		
Input-Output Resistance	$R_{I-O}$	-	$10^{12}$	-	$\Omega$	$V_{I-O} = 500\text{V}_{DC}$

Note 1: Resistive load. For inductive loads, higher drive current is recommended

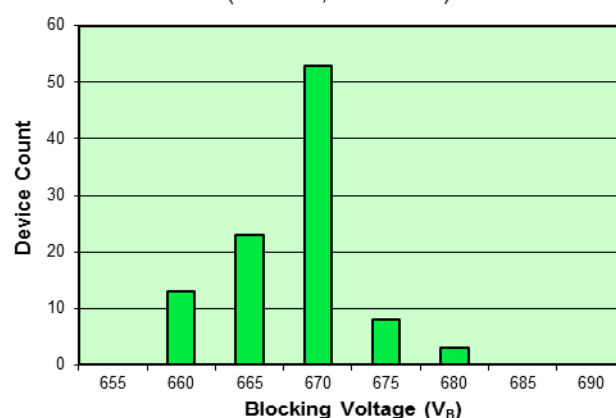
Note 2: This is for static  $dV/dt$ .

**SYZ6060 Performance & Characteristics Plots,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**

**Figure 1: Maximum Load Current vs. Temperature**



**Figure 2: Typical Blocking Voltage Distribution (N = 100,  $T_A = 25^\circ\text{C}$ )**



## SYZ6060 Solder Temperature Profile Recommendations

### (1) Infrared Reflow:

Refer to the following figure as an example of an optimal temperature profile for single occurrence infrared reflow. Soldering process should not exceed temperature or time limits expressed herein. Surface temperature of device package should not exceed 250°C:

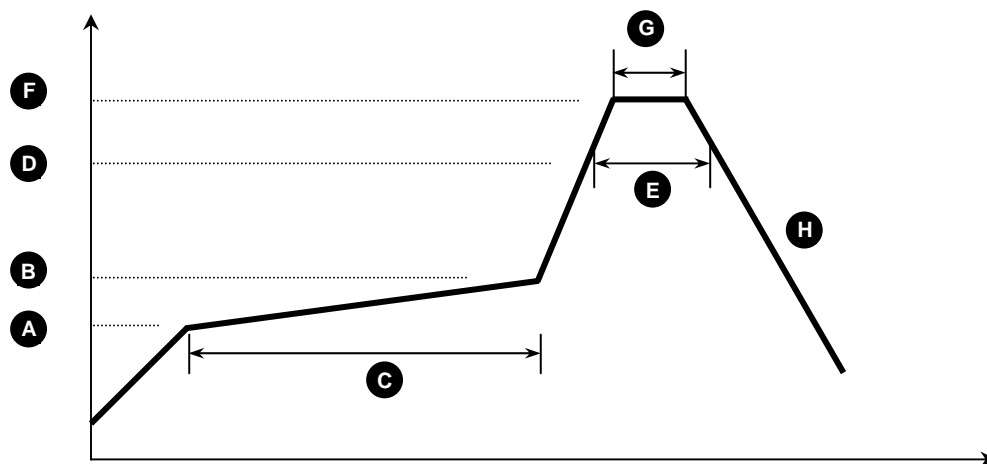


Figure 1

Process Step	Description	Parameter
A	Preheat Start Temperature (°C)	150°C
B	Preheat Finish Temperature (°C)	180°C
C	Preheat Time (s)	90 - 120s
D	Melting Temperature (°C)	230°C
E	Time above Melting Temperature (s)	30s
F	Peak Temperature, at Terminal (°C)	260°C
G	Dwell Time at Peak Temperature (s)	10s
H	Cool-down (°C/s)	<6°C/s

### (2) Wave Solder:

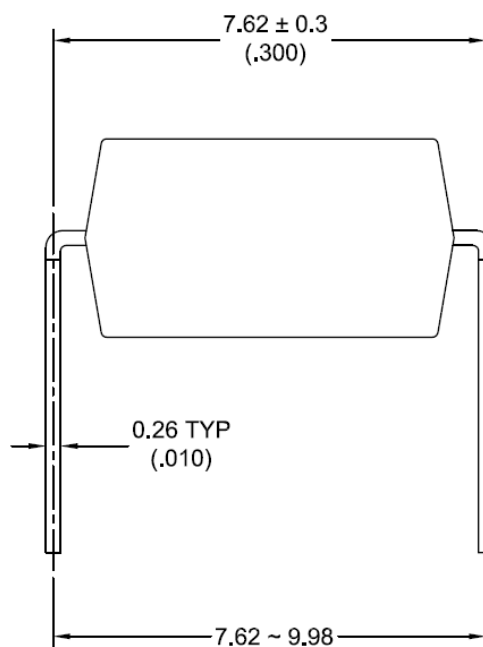
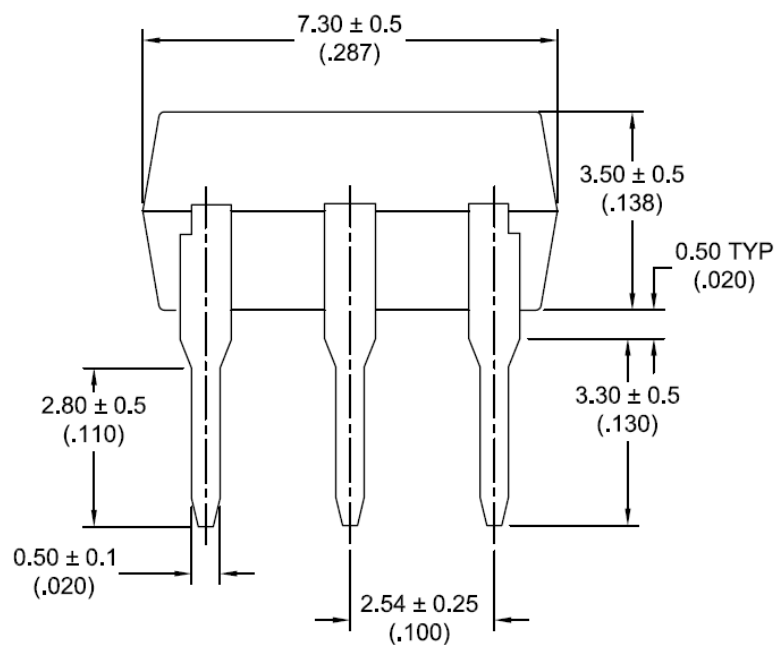
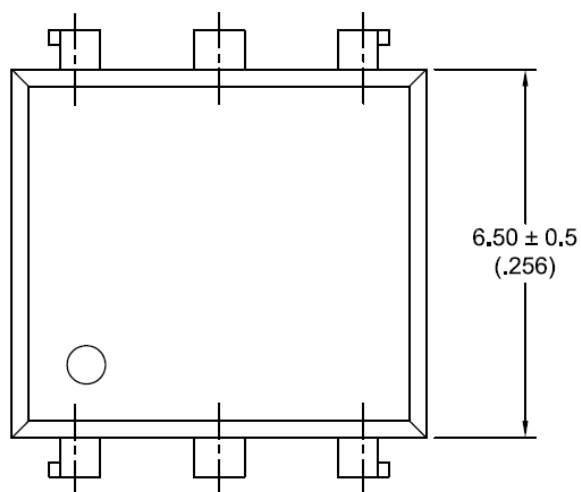
Maximum Temperature: 260°C (at terminal)  
Maximum Time: 10s  
Pre-heating: 100 - 150°C (30 - 90s)  
Single Occurrence

### (3) Hand Solder:

Maximum Temperature: 350°C (at tip of soldering iron)  
Maximum Time: 3s  
Single Occurrence

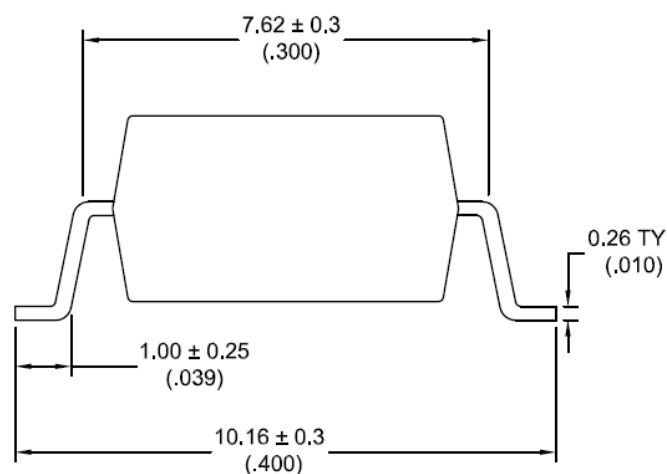
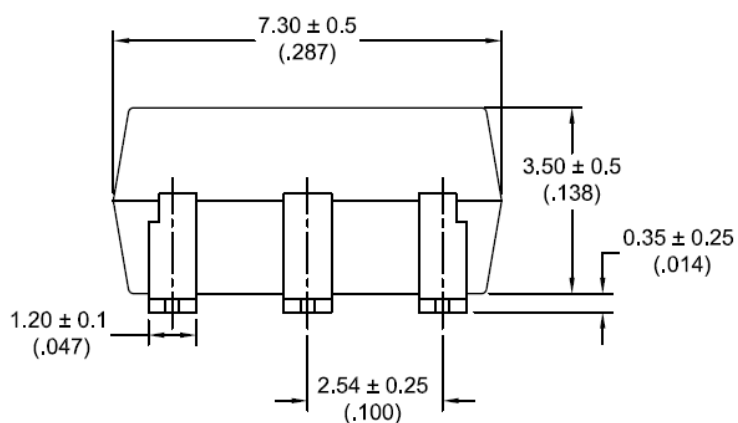
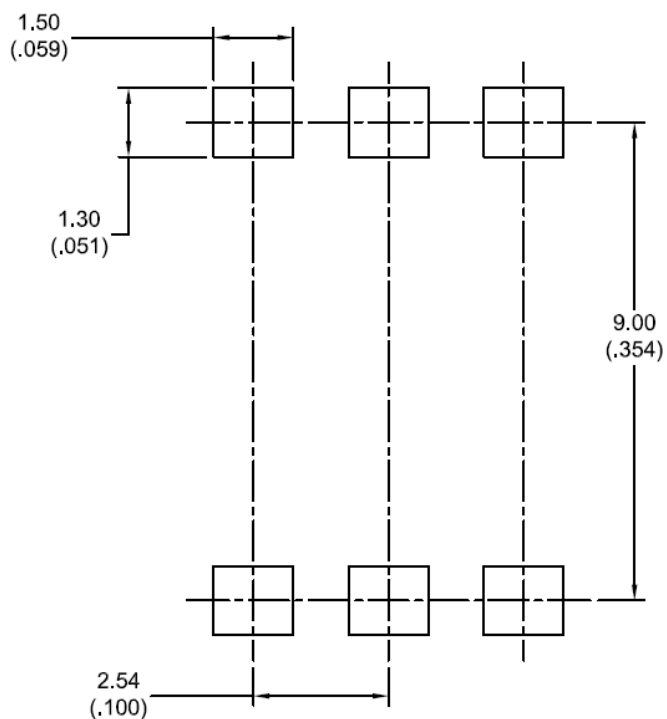
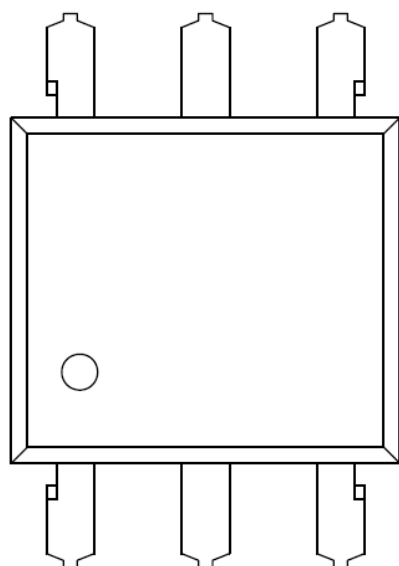
**SYZ6060 Package Dimensions**

6 PIN DIP Package

**Note:** All dimensions in millimeters with inches ["] in parenthesis ( )


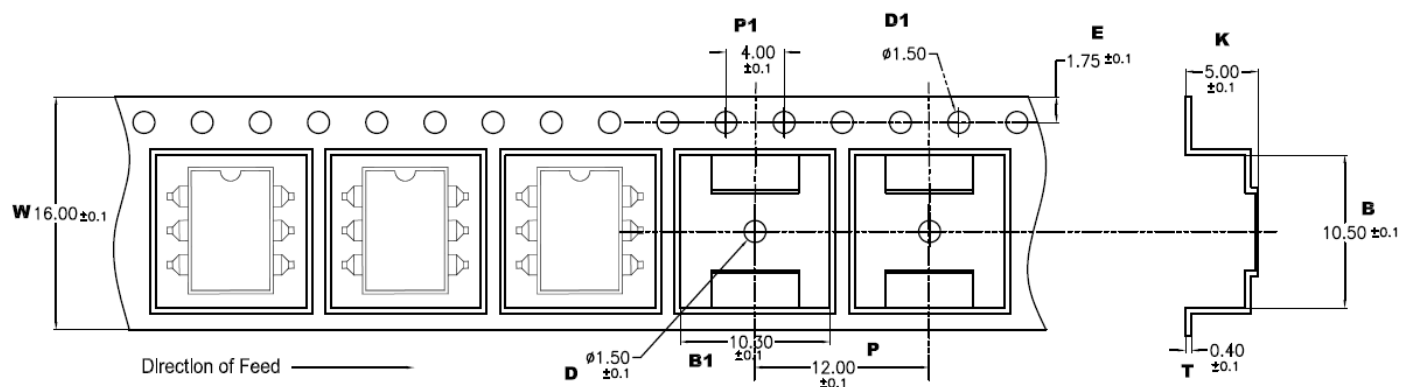
**SYZ6060 Package Dimensions**

6 PIN SMD Surface Mount Package (-S)

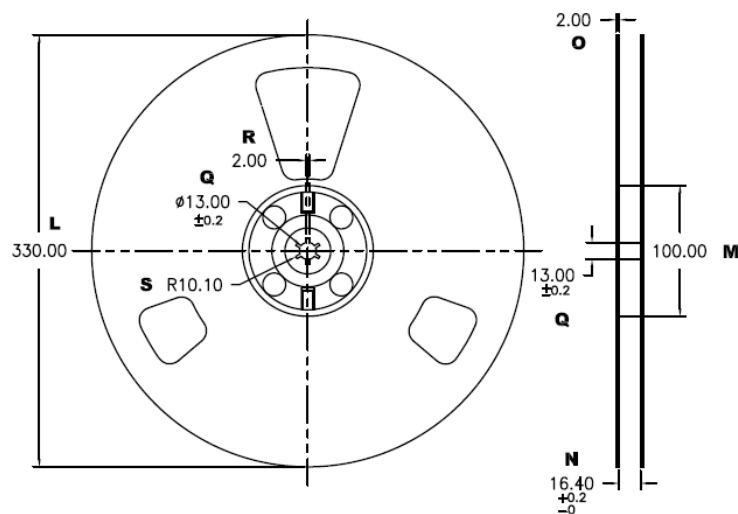
**Note:** All dimensions in millimeters with inches ["] in parenthesis ( )


**SYZ6060 Package Dimensions**

6 PIN SMD Tape &amp; Reel (-STR)

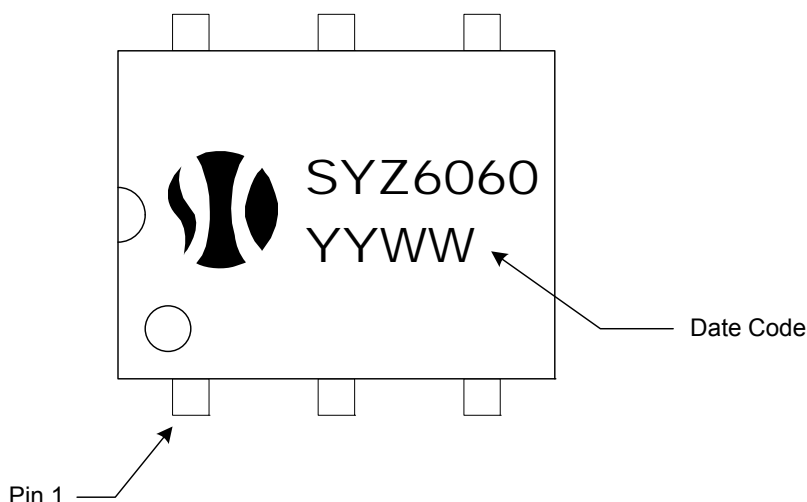
**Note:** All dimensions in millimeters


W	B	B1	P	P1	K	E	T	D	D1
16.00 ±0.1	10.50 ±0.1	10.30 ±0.1	12.00 ±0.1	4.00 ±0.1	5.00 ±0.1	1.75 ±0.1	0.40 ±0.1	1.50 ±0.1	1.50 ±0.1



L	M	N	O	Q	R	S
330.00	100.00	16.40 ±0.2	2.00 ±0.1	13.00 ±0.2	2.00	10.00

## SYZ6060 Package Marking



## SYZ6060 Package Weights

Device	Single Unit	Full Tube (60pcs)	Full Pouch (10 tubes)	Full Reel (1000pcs)
SYZ6060-(H)	0.41	43	450	-
SYZ6060-(H)S	0.40	42	440	-
SYZ6060-(H)STR	0.40	-	-	880

**Note:** All weights above are in GRAMS, and include packaging materials where applicable

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