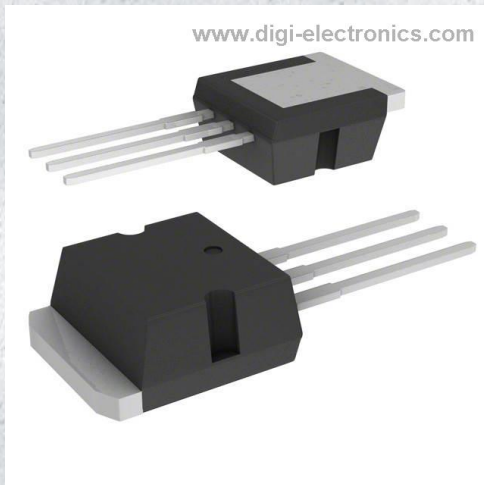


# STPS30M60SR Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	STPS30M60SR-DG
Manufacturer	<a href="#">STMicroelectronics</a>
Manufacturer Product Number	STPS30M60SR
Description	DIODE SCHOTTKY 60V 30A I2PAK
Detailed Description	Diode 60 V 30A Through Hole I2PAK

This model STPS30M60SR is available at DiGi Electronics.

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## Purchase and inquiry

Manufacturer Product Number:

STPS30M60SR

Series:

-

Technology:

Schottky

Current - Average Rectified (Io):

30A

Speed:

Fast Recovery =< 500ns, > 200mA (Io)

Capacitance @ Vr, F:

-

Package / Case:

TO-262-3 Long Leads, I2PAK, TO-262AA

Operating Temperature - Junction:

150°C (Max)

Manufacturer:

STMicroelectronics

Product Status:

Obsolete

Voltage - DC Reverse (Vr) (Max):

60 V

Voltage - Forward (Vf) (Max) @ If:

590 mV @ 30 A

Current - Reverse Leakage @ Vr:

165 µA @ 60 V

Mounting Type:

Through Hole

Supplier Device Package:

I2PAK

Base Product Number:

STPS30

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0080

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99



# STPS30M60S

## Power Schottky rectifier

### Features

- High current capability
- Avalanche rated
- Low forward voltage drop
- High frequency operation

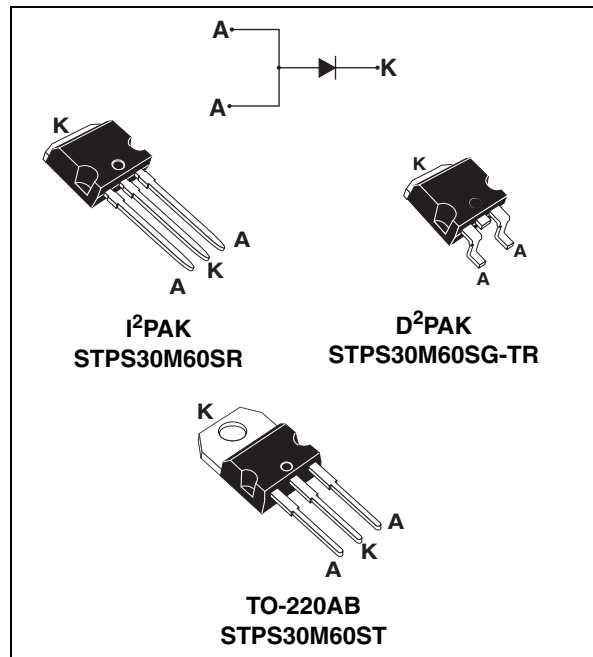
### Description

The STPS30M60S is a single Schottky diode, suited for high frequency switch mode power supply.

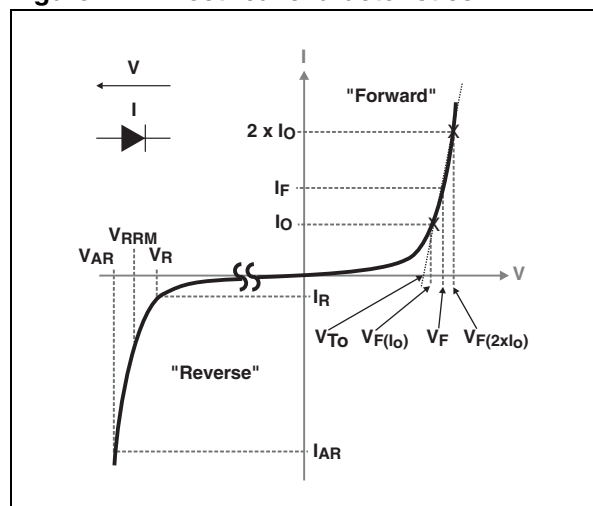
Packaged in TO-220AB, I<sup>2</sup>PAK and D<sup>2</sup>PAK, this device is intended to be used in notebook, game station and desktop adapters, providing in these applications a good efficiency at both low and high load.

**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	30 A
$V_{RRM}$	60 V
$V_F$ (typ)	0.380 V
$T_j$ (max)	150 °C



**Figure 1. Electrical characteristics (a)**



- a.  $V_{ARM}$  and  $I_{ARM}$  must respect the reverse safe operating area defined in [Figure 12](#).  $V_{AR}$  and  $I_{AR}$  are pulse measurements ( $t_p < 1 \mu s$ ).  $V_R$ ,  $I_R$ ,  $V_{RRM}$  and  $V_F$  are static characteristics

# 1 Characteristics

**Table 2. Absolute ratings (limiting values with terminals 1 and 3 short circuited at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		60	V
$I_{F(RMS)}$	Forward rms current		90	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 130\text{ °C}$ Per package	30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms sine-wave}$	600	A
$P_{ARM}^{(1)}$	Repetitive peak avalanche power	$T_j = 25\text{ °C}, t_p = 1\text{ }\mu\text{s}$	34400	W
$V_{ARM}^{(2)}$	Maximum repetitive peak avalanche voltage	$t_p < 1\text{ }\mu\text{s}, T_j < 150\text{ °C}, I_{AR} < 129\text{ A}$	80	V
$V_{ASM}^{(2)}$	Maximum single-pulse peak avalanche voltage	$t_p < 1\text{ }\mu\text{s}, T_j < 150\text{ °C}, I_{AR} < 129\text{ A}$	80	V
$T_{stg}$	Storage temperature range		-65 to +175	°C
$T_j$	Maximum operating junction temperature <sup>(3)</sup>		150	°C

1. For temperature or pulse time duration deratings, please refer to [Figure 4](#) and [5](#). More details regarding the avalanche energy measurements and diode validation in the avalanche are provided in the application notes AN1768 and AN2025.

2. See [Figure 12](#)

3.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	0.9	°C/W

**Table 4. Static electrical characteristics (terminals 1 and 3 short circuited)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit	
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-	35	165	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	25	100	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$	-	0.475	0.515	V
		$T_j = 125\text{ °C}$		-	0.380	0.425	
		$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$	-	0.540	0.590	
		$T_j = 125\text{ °C}$		-	0.470	0.535	

1. Pulse test:  $t_p = 5\text{ ms}, \delta < 2\%$

2. Pulse test:  $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.395 \times I_{F(AV)} + 0.0047 \times I_{F(RMS)}^2$$

Figure 2. Average forward power dissipation versus average forward current

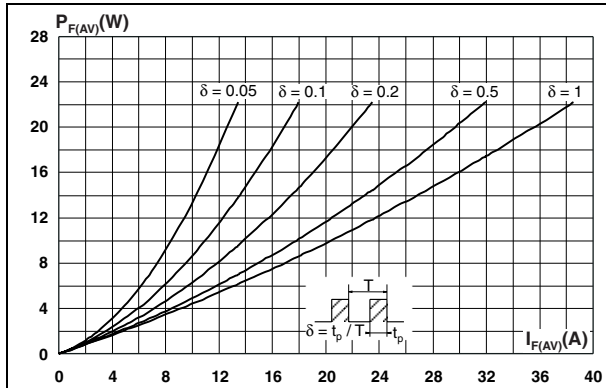


Figure 3. Average forward current versus ambient temperature ( $\delta = 0.5$ )

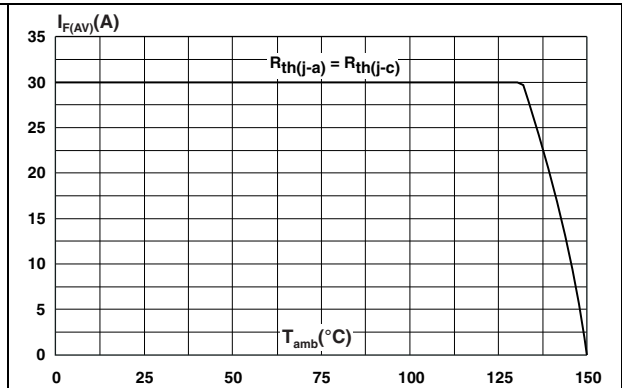


Figure 4. Normalized avalanche power derating versus pulse duration

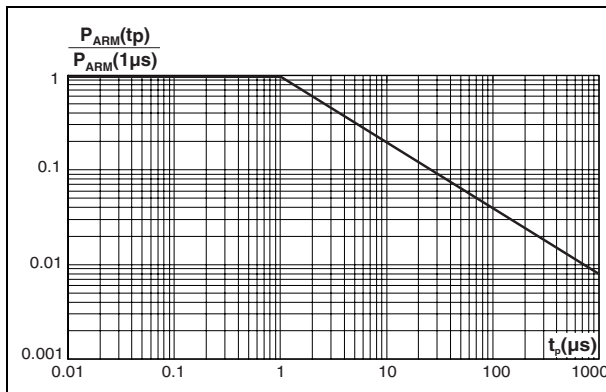


Figure 5. Normalized avalanche power derating versus junction temperature

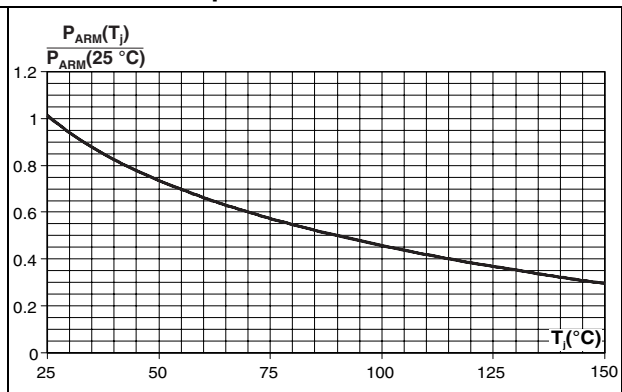


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values)

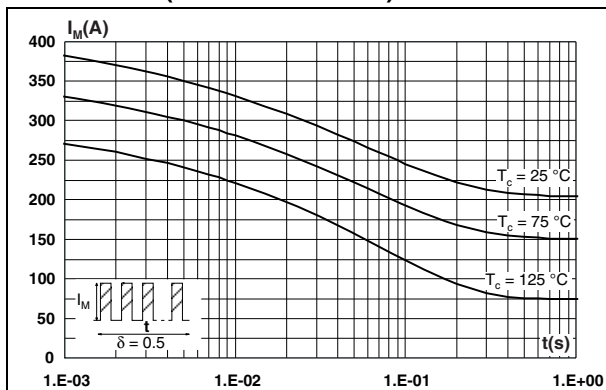


Figure 7. Relative variation of thermal impedance junction to case versus pulse duration

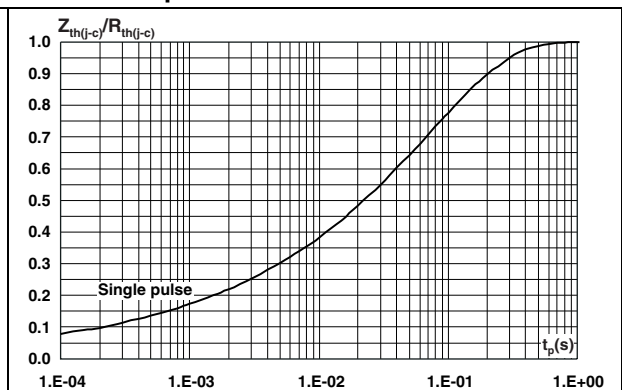


Figure 8. Reverse leakage current versus reverse voltage applied (typical values)

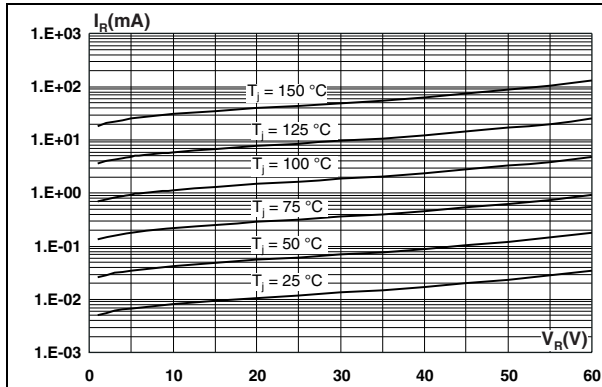


Figure 9. Junction capacitance versus reverse voltage applied (typical values)

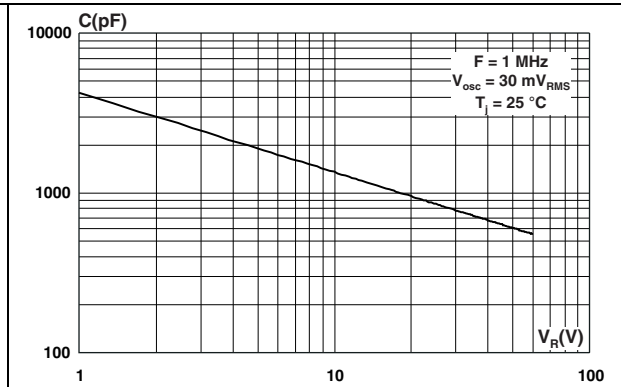


Figure 10. Forward voltage drop versus forward current

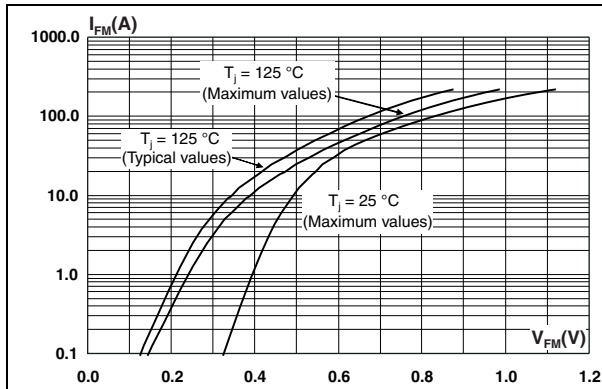


Figure 11. Thermal resistance junction to ambient versus copper surface under tab

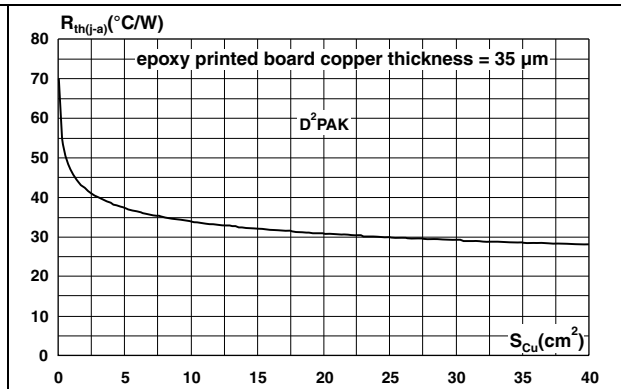
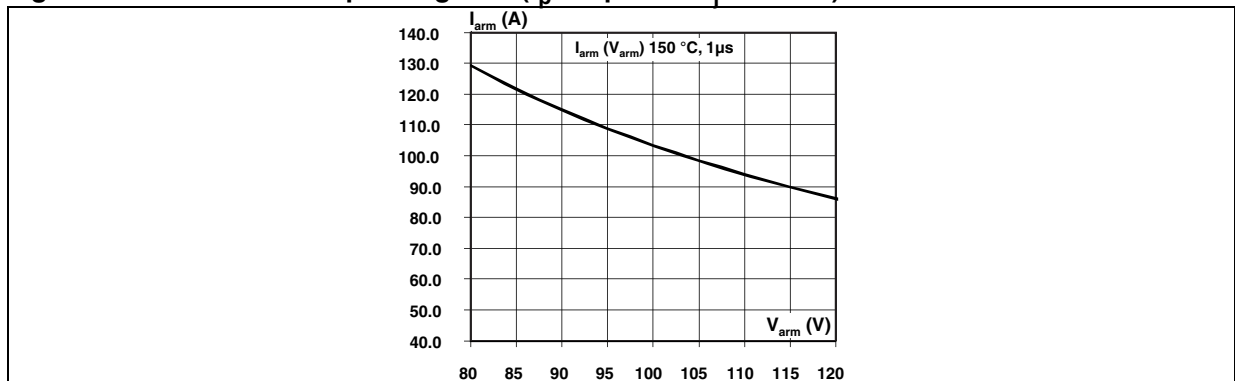


Figure 12. Reverse safe operating area ( $t_p < 1\text{ }\mu\text{s}$  and  $T_j < 150\text{ °C}$ )



## 2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

**Table 5. TO-220AB dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 Typ.		0.645 Typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 Typ.		0.102 Typ.	
Dia.	3.75	3.85	0.147	0.151

Table 6. D<sup>2</sup>PAK dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

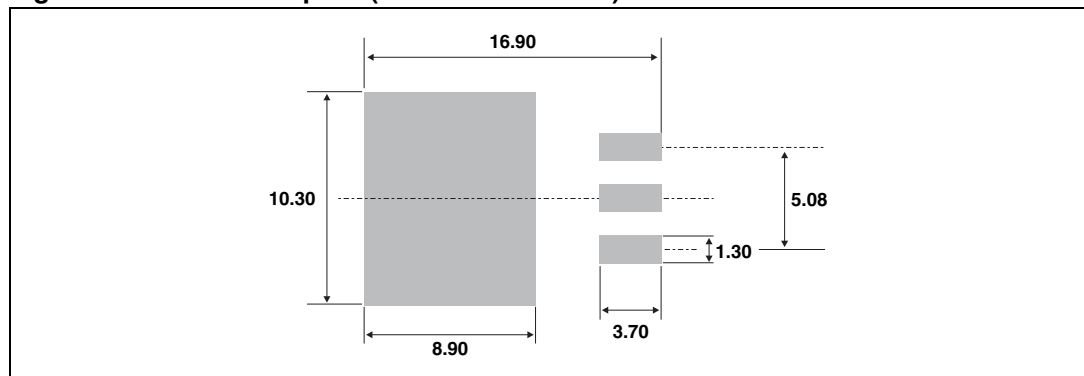
Figure 13. D<sup>2</sup>PAK footprint (dimensions in mm)

Table 7. I<sup>2</sup>PAK dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.40	2.72	0.094	0.107
b	0.61	0.88	0.024	0.035
b1	1.14	1.70	0.044	0.067
c	0.49	0.70	0.019	0.028
c2	1.23	1.32	0.048	0.052
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.195	0.203
E	10	10.40	0.394	0.409
L	13	14	0.512	0.551
L1	3.50	3.93	0.138	0.155
L2	1.27	1.40	0.050	0.055

### 3 Ordering information

**Table 8. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30M60ST	STPS30M60ST	TO-220AB	2.2 g	50	Tube
STPS30M60SR	STPS30M60SR	I <sup>2</sup> PAK	1.49 g	50	Tube
STPS30M60SG-TR	STPS30M60SG	D <sup>2</sup> PAK	1.48 g	1000	Tape and reel

### 4 Revision history

**Table 9. Revision history**

Date	Revision	Changes
14-Oct-2011	1	First issue.

**STPS30M60S**

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