

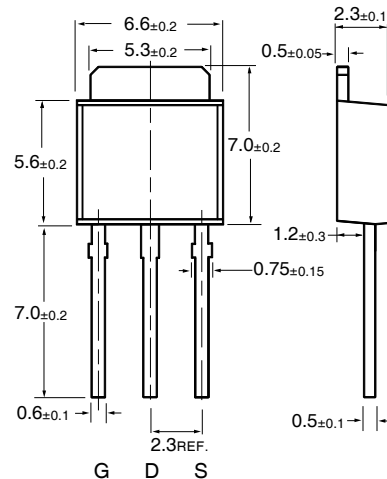
## Description

The SID01L60 (through-hole version) is universally preferred for all commercial-industrial surface mount applications and suited for AC/DC converters.

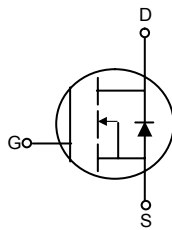
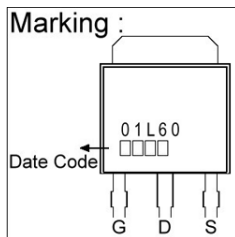
## Features

- \* RoHs Compliant
- \* Simple Drive Requirement
- \* Fast Switching Speed
- \* Repetitive Avalanche Rated

TO-251



Dimensions in millimeters



## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	600	V
Gate-Source Voltage	V <sub>GS</sub>	±30	V
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =25°C	1	A
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =100°C	0.8	A
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	3	A
Total Power Dissipation	P <sub>D</sub> @T <sub>C</sub> =25°C	29	W
Linear Derating Factor		0.232	W/°C
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	0.5	mJ
Avalanche Current	I <sub>AR</sub>	1	A
Repetitive Avalanche Energy	E <sub>AR</sub>	0.5	mJ
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55~+150	°C

## Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-case	R <sub>thj-c</sub>	4.3	°C/W
Thermal Resistance Junction-ambient	R <sub>thj-a</sub>	110	°C/W

**Electrical Characteristics( T<sub>j</sub>=25°C Unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	–	–	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	–	0.8	–	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	2.0	–	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Source Leakage Current	I <sub>GSS</sub>	–	–	±100	nA	V <sub>GS</sub> =±30V
Drain-Source Leakage Current (T <sub>j</sub> =25°C)	I <sub>DSS</sub>	–	–	10	μA	V <sub>DS</sub> =600V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =150°C)		–	–	100	μA	V <sub>DS</sub> =480V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	–	–	12	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =0.5A
Forward Transconductance	G <sub>fs</sub>	–	0.8	–	S	V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A
Total Gate Charge <sup>3</sup>	Q <sub>g</sub>	–	4	–	nC	I <sub>D</sub> =1 A V <sub>DS</sub> =480V V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	–	1	–		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	–	1.1	–		
Turn-on Delay Time <sup>3</sup>	T <sub>d(ON)</sub>	–	6.6	–	nS	V <sub>DD</sub> =300V I <sub>D</sub> =1 A V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω R <sub>D</sub> =300 Ω
Rise Time	T <sub>r</sub>	–	5	–		
Turn-off Delay Time	T <sub>d(off)</sub>	–	11.7	–		
Fall Time	T <sub>f</sub>	–	9.2	–		
Input Capacitance	C <sub>iss</sub>	–	170	–	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	–	30.7	–		
Reverse Transfer Capacitance	C <sub>rss</sub>	–	5.1	–		

**Source-Drain Diode**

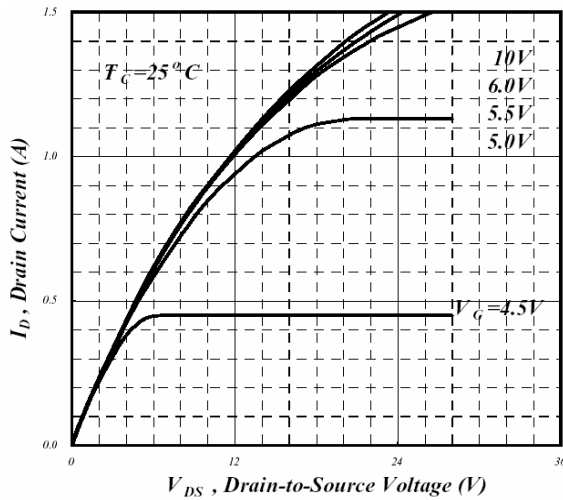
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage <sup>3</sup>	V <sub>SD</sub>	–	–	1.2	V	I <sub>S</sub> =1A, V <sub>GS</sub> =0V, T <sub>j</sub> =25°C
Continuous Source Current(Body Diode)	I <sub>S</sub>	–	–	1	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.2 V
Pulsed Source Current(Body Diode) <sup>1</sup>	I <sub>SM</sub>	–	–	5	A	

Notes: 1. Pulse width limited by safe operating area.

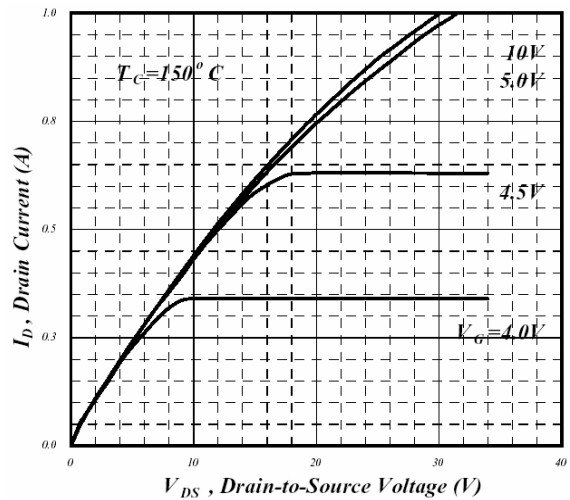
2. Starting T<sub>j</sub>=25°C, V<sub>DD</sub>=50V, L=10mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=1.0A.

3. Pulse width ≤ 300us, duty cycle ≤ 2%.

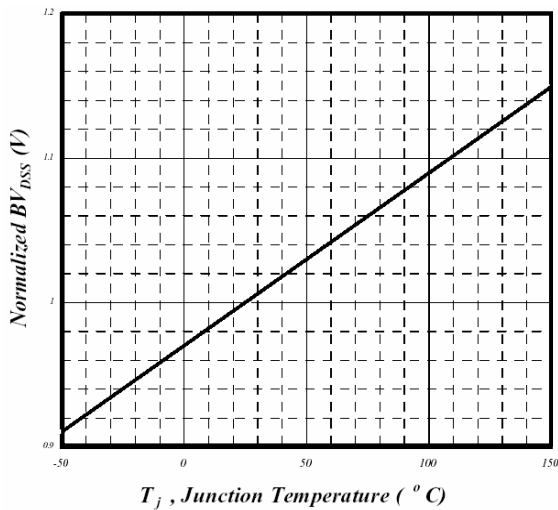
**Characteristics Curve**



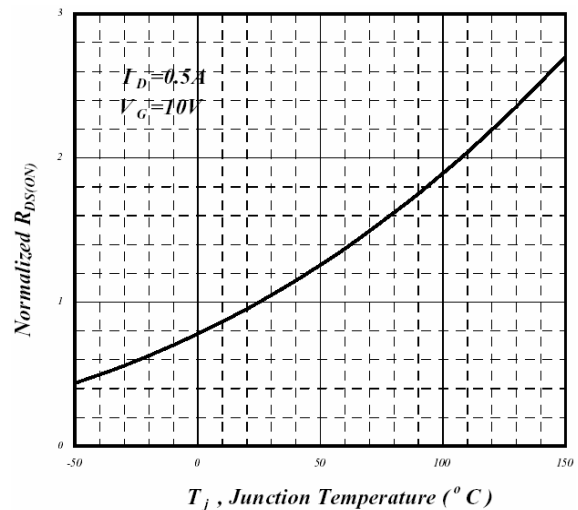
**Fig 1. Typical Output Characteristics**



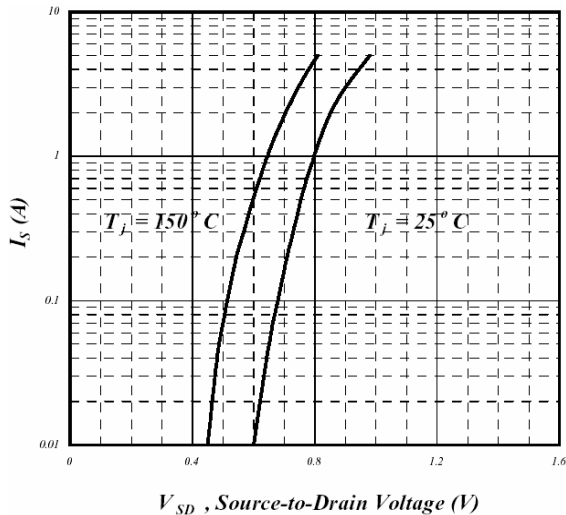
**Fig 2. Typical Output Characteristics**



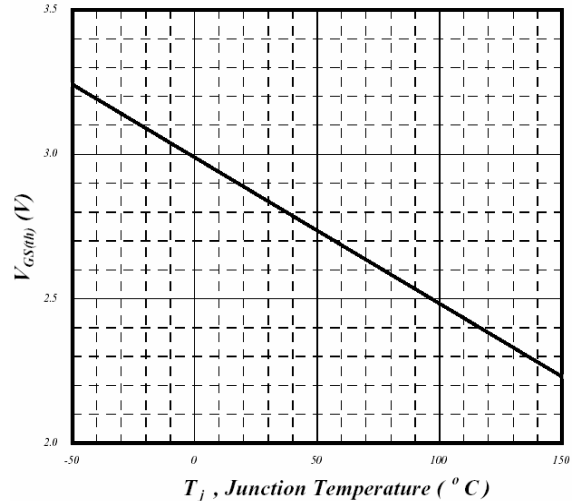
**Fig 3. Normalized  $BV_{DSS}$  v.s. Junction Temperature**



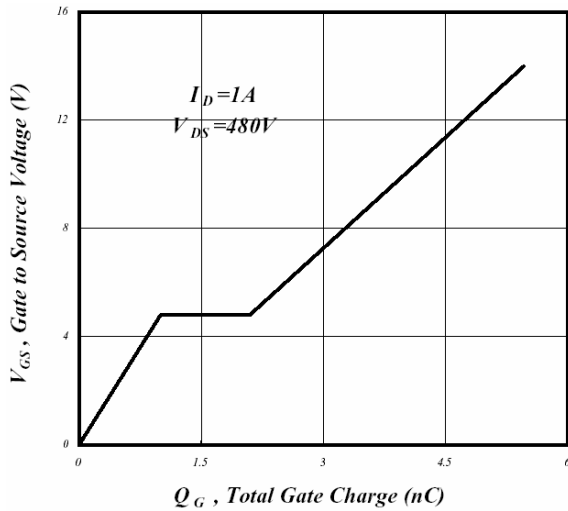
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



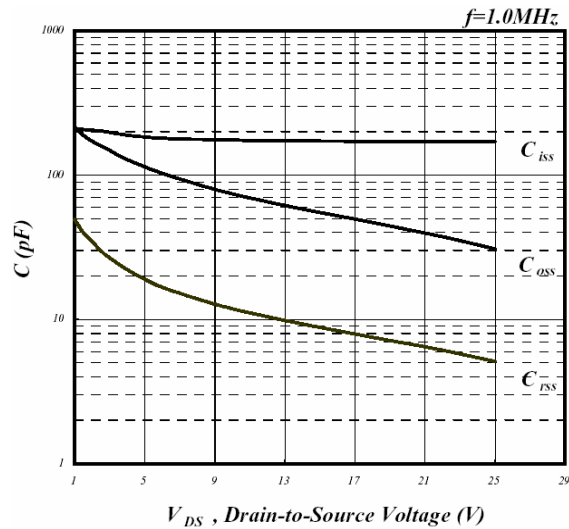
**Fig 5. Forward Characteristics of Reverse Diode**



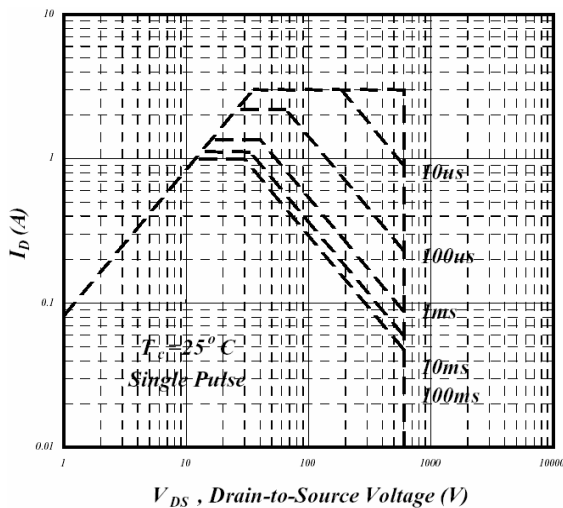
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



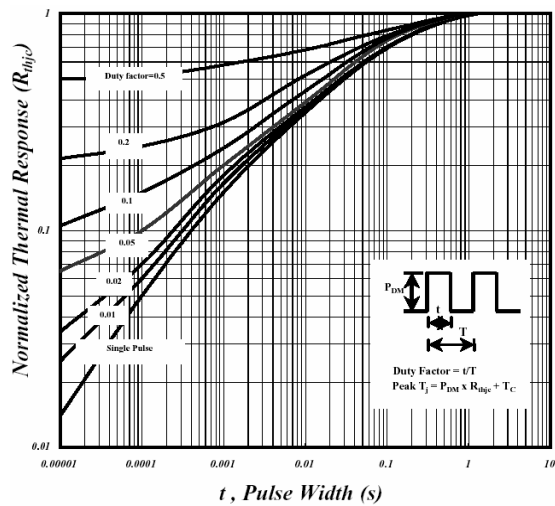
**Fig 7. Gate Charge Characteristics**



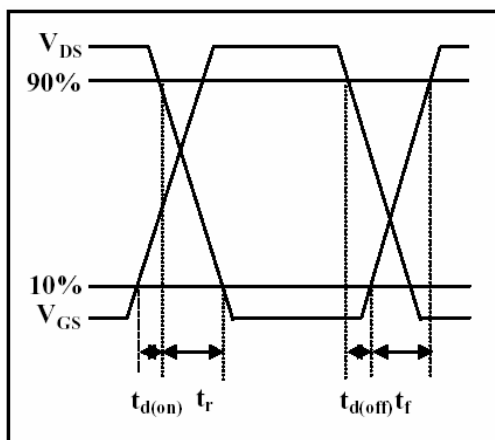
**Fig 8. Typical Capacitance Characteristics**



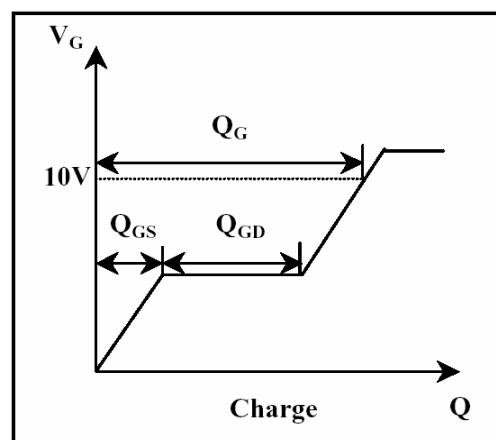
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**