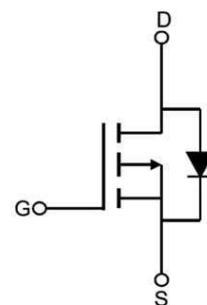


Features

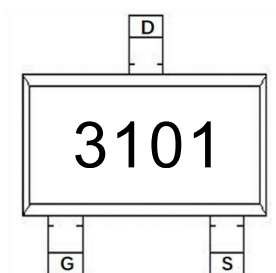
- -30V,-10A
 $R_{DS(on)}$ (TYP: $16m\Omega$) < $23m\Omega$ @ $V_{GS}=-10V$
 $R_{DS(on)}$ (TYP: $25m\Omega$) < $34m\Omega$ @ $V_{GS}=-4.5V$
- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability



Schematic Diagram

Applications

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking and pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3101	AP3101A	SOT23-3	-	-	3000

ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_A=25^{\circ}C$) ⁽¹⁾	I_D	-10	A
Continuous Drain Current ($T_A=100^{\circ}C$)	I_D	-7	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-40	A
Drain Power Dissipation	P_D	3.7	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	33.8	$^{\circ}C/W$
Junction Temperature	T_J	-55~ +150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

Notes:

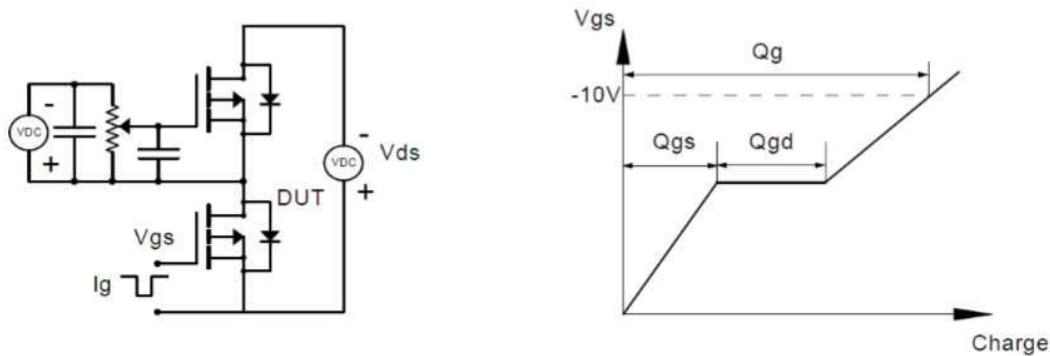
- 1) Repetitive Rating: pulse width limited by maximum junction temperature

MOSFET ELECTRICAL CHARACTERISTICS($T_J=25^{\circ}\text{C}$ unless otherwise noted)

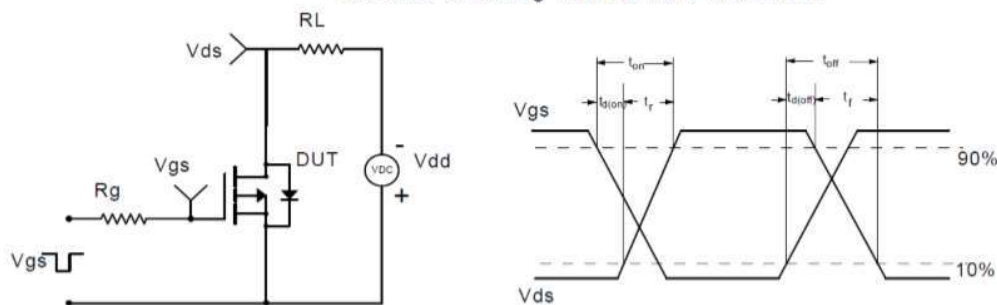
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =-250μA	-30	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-30V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.5	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A	-	16	23	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	25	34	mΩ
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f=1MHz	-	1550	-	pF
Output Capacitance	C _{oss}		-	327	-	
Reverse Transfer Capacitance	C _{rss}		-	278	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =-15V, I _D =-6A, R _G =2.5Ω, V _{GS} =-10V	-	14	-	ns
Turn-on rise time	t _r		-	20	-	
Turn-off delay time	t _{d(off)}		-	95	-	
Turn-off fall time	t _f		-	65	-	
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	5.3	-	
Gate-Drain Charge	Q _{gd}		-	7.6	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _J =25℃, V _{GS} =0V, I _S =-10A	-	-	-1.2	V
Diode Forward current	I _S	T _C =25℃	-	-	-10	A

Test Circuit

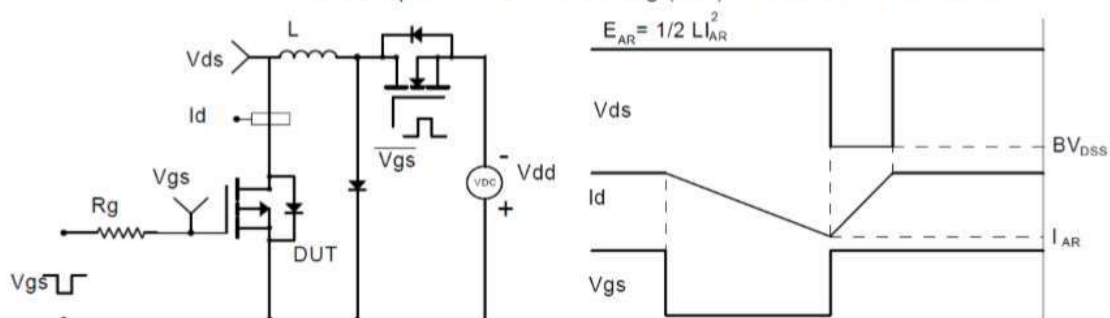
Gate Charge Test Circuit & Waveform



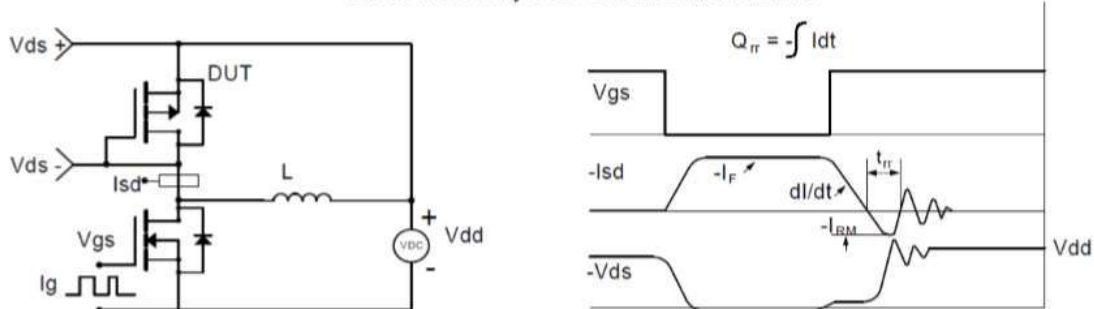
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

Figure 1: Output Characteristics

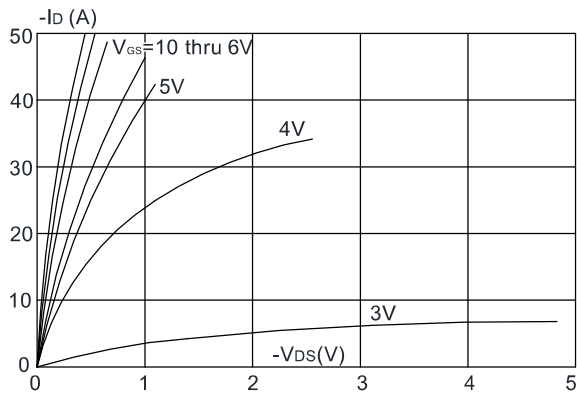


Figure 2: Typical Transfer Characteristics

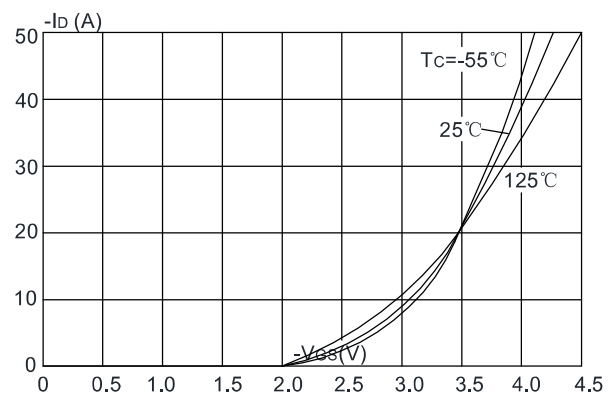


Figure 3: On-resistance vs. Drain Current

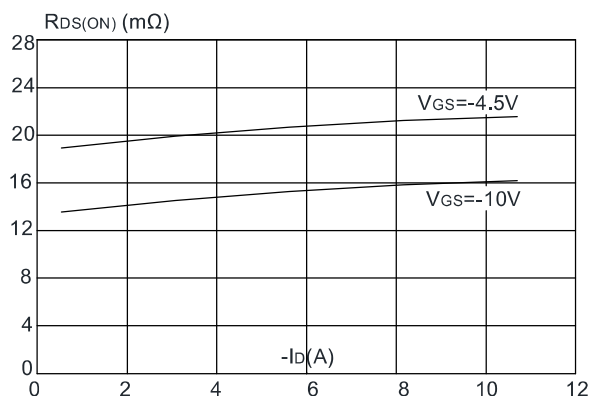


Figure 4: Body Diode Characteristics

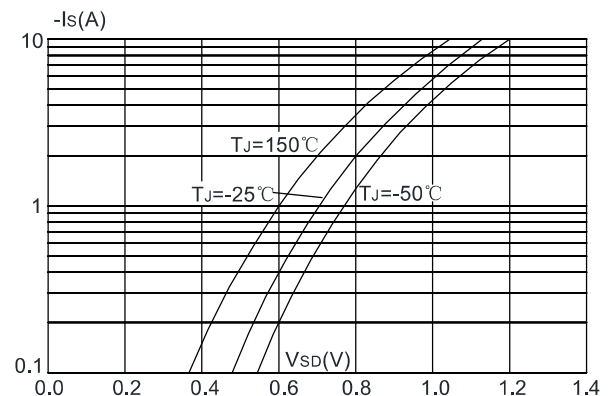


Figure 5: Gate Charge Characteristics

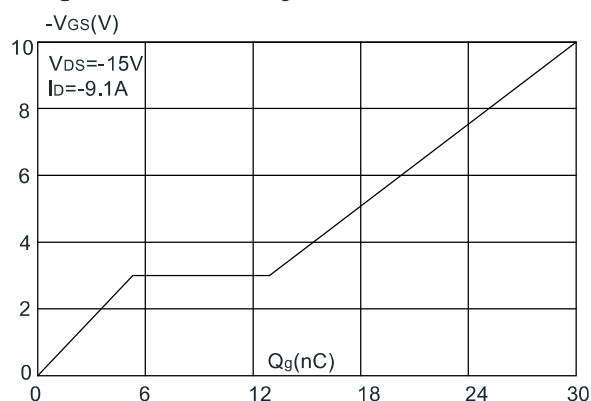
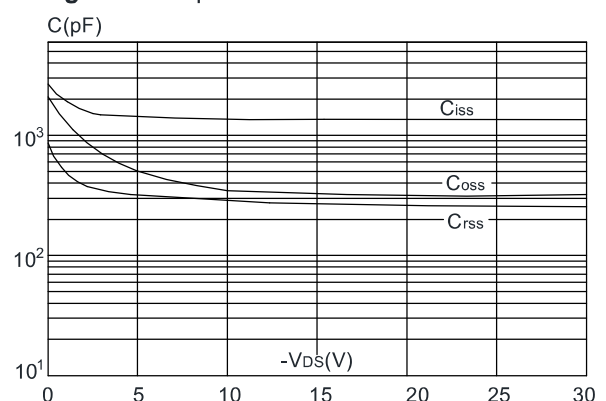


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

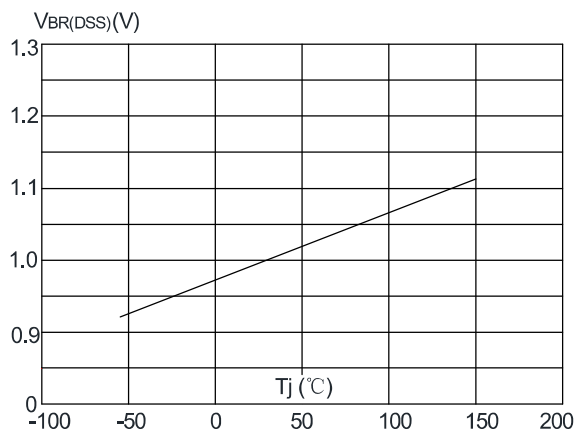


Figure 8: Normalized on Resistance vs. Junction Temperature

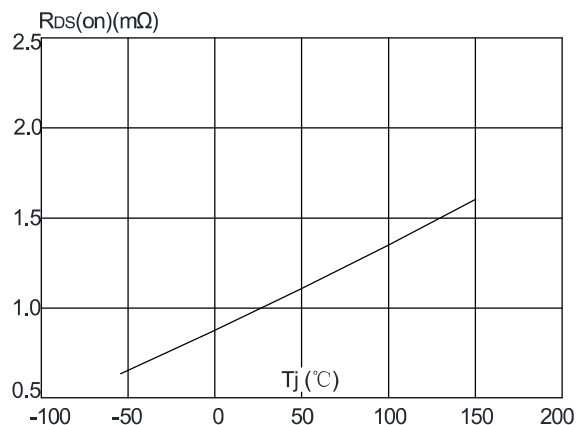


Figure 9: Maximum Safe Operating Area

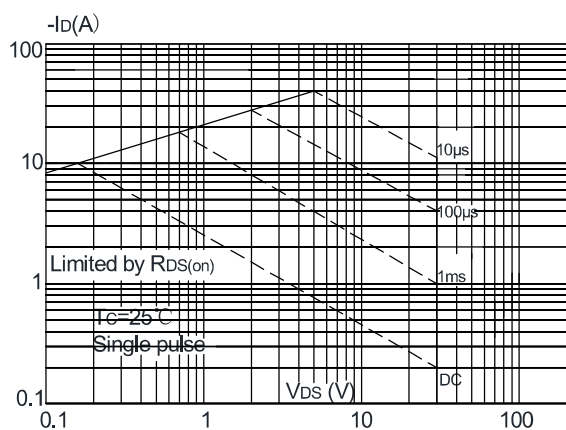


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

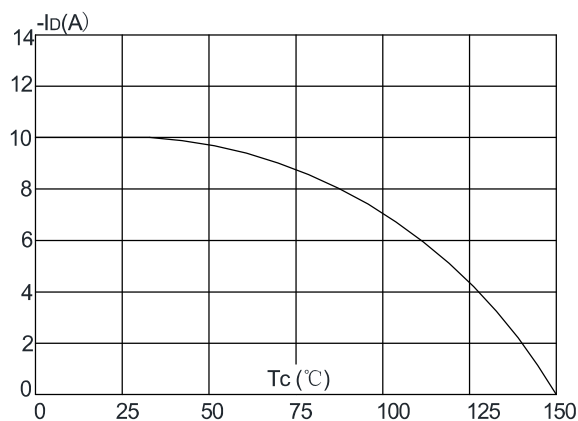
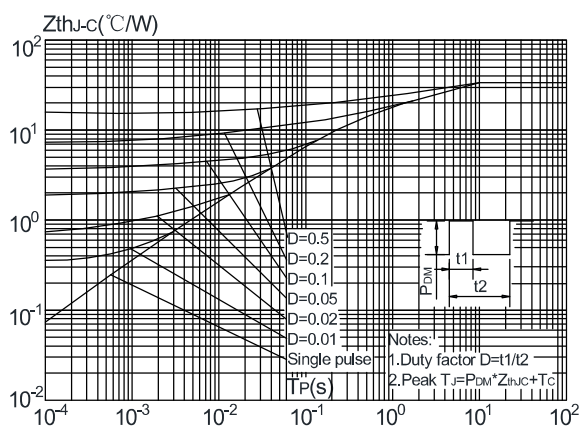
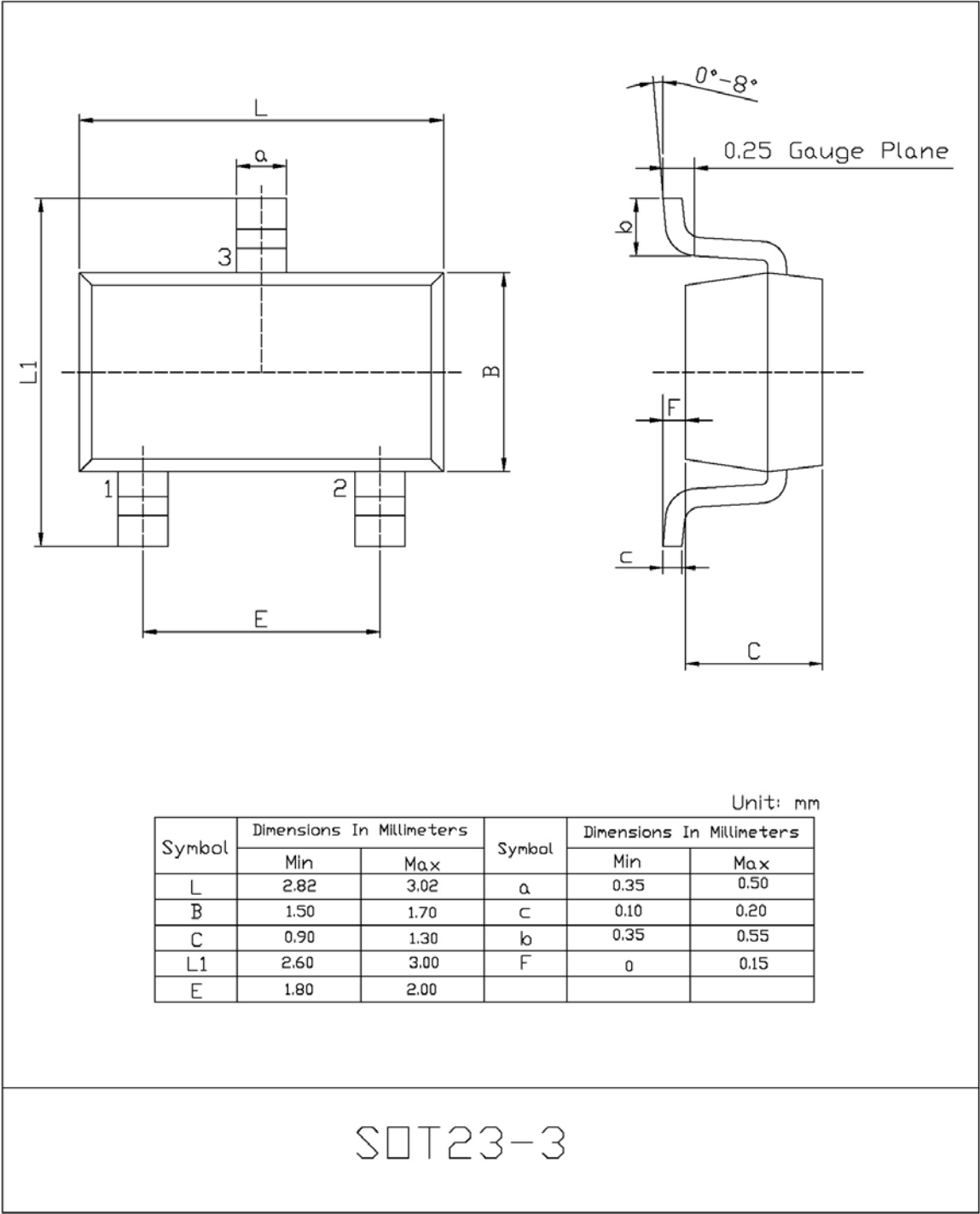


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



SOT23-3 Package Information



Revision History

Revision	Release	Remark
V1.1	2025/4/28	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product, but similar performance is not guaranteed under other working conditions, and cannot be guaranteed when installed with other products or equipment. To achieve the required performance of the product in actual scenarios, the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings, operating conditions, or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability. Customers using or selling these products for use in medical, life-saving, or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements, the information described or contained herein may be changed without prior notice.