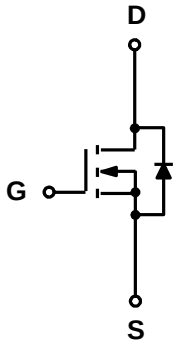
APG042N15

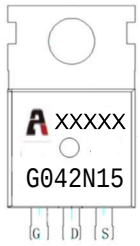
N-Channel Enhancement Mosfet

DATA SHEET

Features

- 150V,206A
  $R_{DS(ON)}$ <4.2mΩ@V_{GS}=10V TYP:3.6mΩ
- High Speed Power Smooth Switching
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free





Marking and pin assignment

Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- Power Tools
- UPS
- Motor Control

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G042N15	APG042N15	TO-220	-	-	1000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Silicon Limited)	Tc=25℃	I_D	206	A
	Tc=100℃		146	A
Continuous Drain Current (Package Limited) Tc=25℃			180	A
Pulsed Drain Current		I_{DM}	750	A
Single Pulsed Avalanche Energy (Tc=25℃,L=0.4mH) (2)		E_{AS}	720	mJ
Drain Power Dissipation		P_D	429	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.35	℃/W
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$	60	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ 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	150	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V, 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	2.0	2.9	4.0	V
Drain-source on-resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =20A	-	3.6	4.2	mΩ
Gate Resistance	Rg	V_{GS}=0V, V_{DS} Open, f=1MHz		1.9		Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =75V, V_{GS} =0V, f =1.0MHz	-	10640	-	pF
Output Capacitance	C_{oss}		-	729	-	
Reverse Transfer Capacitance	C_{rss}		-	182	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=75V, I_D=20A, R_G=10Ω, V_G=10V	-	34	-	ns
Turn-on rise time	t_r		-	30	-	
Turn-off delay time	$t_{d(off)}$		-	44	-	
Turn-off fall time	t_f		-	19	-	
Total Gate Charge	Qg	V_{DS}=75V, I_D=20A, V_{GS}=10V	-	206	-	nC
Gate-Source Charge	Qgs		-	44	-	
Gate-Drain Charge	Qgd		-	70	-	
Source-Drain Diode characteristics						
Diode Forward voltage[a]	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=20A	-	-	0.9	V
Diode Forward current	I_S	T_C=25℃	-	-	206	A
Body Diode Reverse Recovery Time	trr	T_J=25℃， IF=20A,di/dt=100A/us		101		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃， IF=20A,di/dt=100A/us		253		uc

Notes:

a) Pulse width ≤ 300 μs, duty cycle ≤ 2%

b) Guaranteed by design, not subject to production testing

Typical Characteristics

Fig 1. Typical Output Characteristics

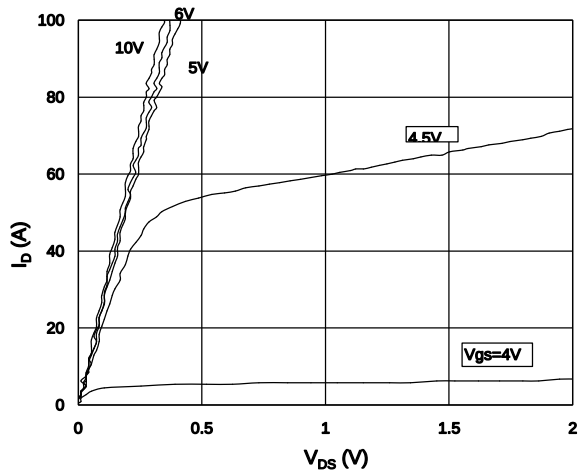


Figure 2. On-Resistance vs. Gate-Source Voltage

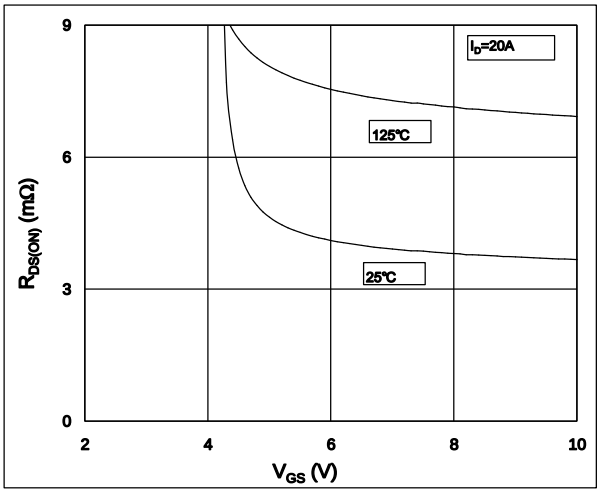


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

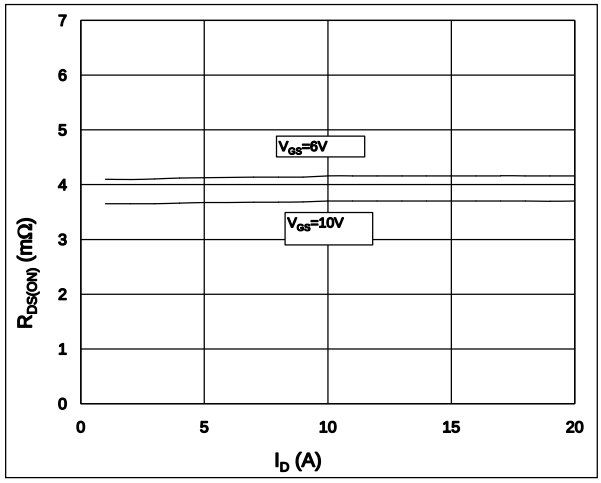


Figure 4. Normalized On-Resistance vs. Junction Temperature

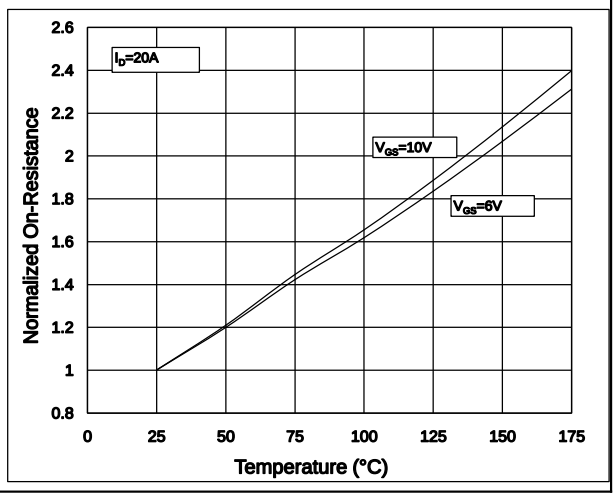


Figure 5. Typical Transfer Characteristics

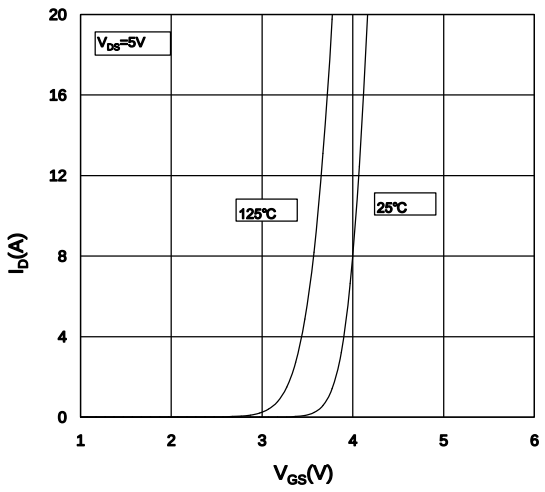
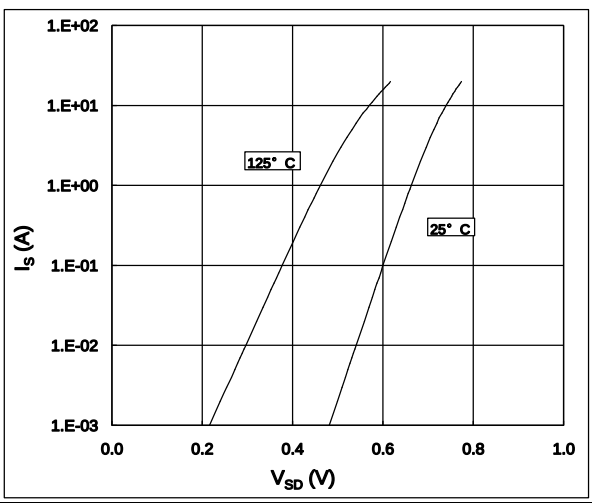


Figure 6. Typical Source-Drain Diode Forward Voltage



Typical Characteristics

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

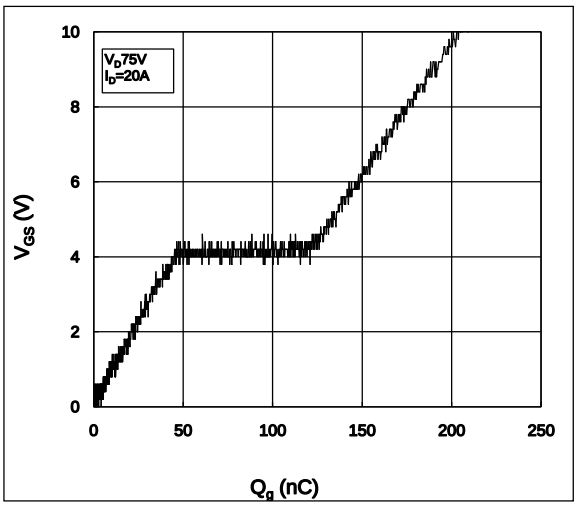


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

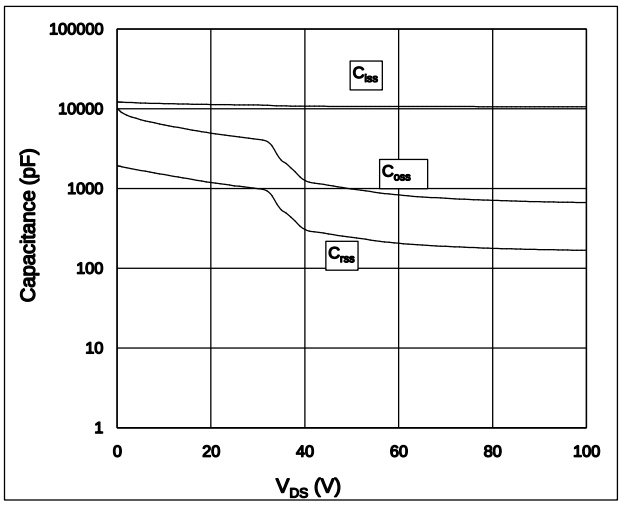


Figure 9. Maximum Safe Operating Area

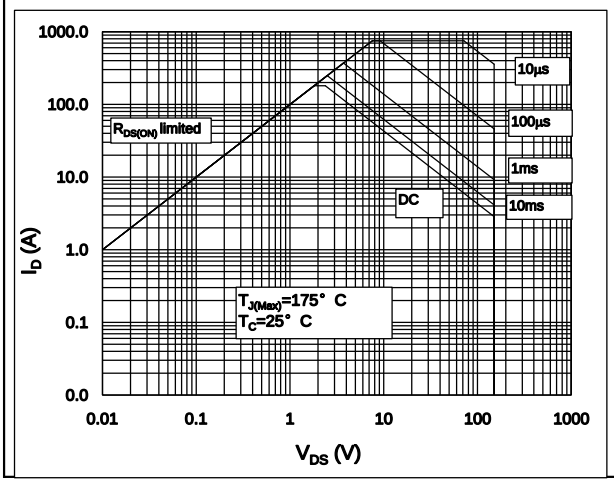


Figure 10. Maximun Drain Current vs. Case Temperature

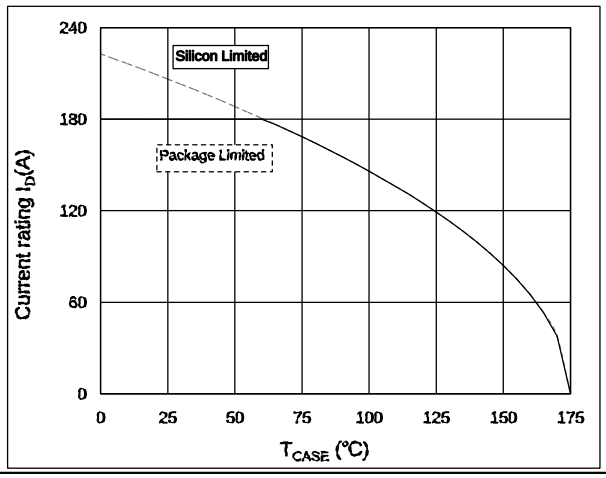
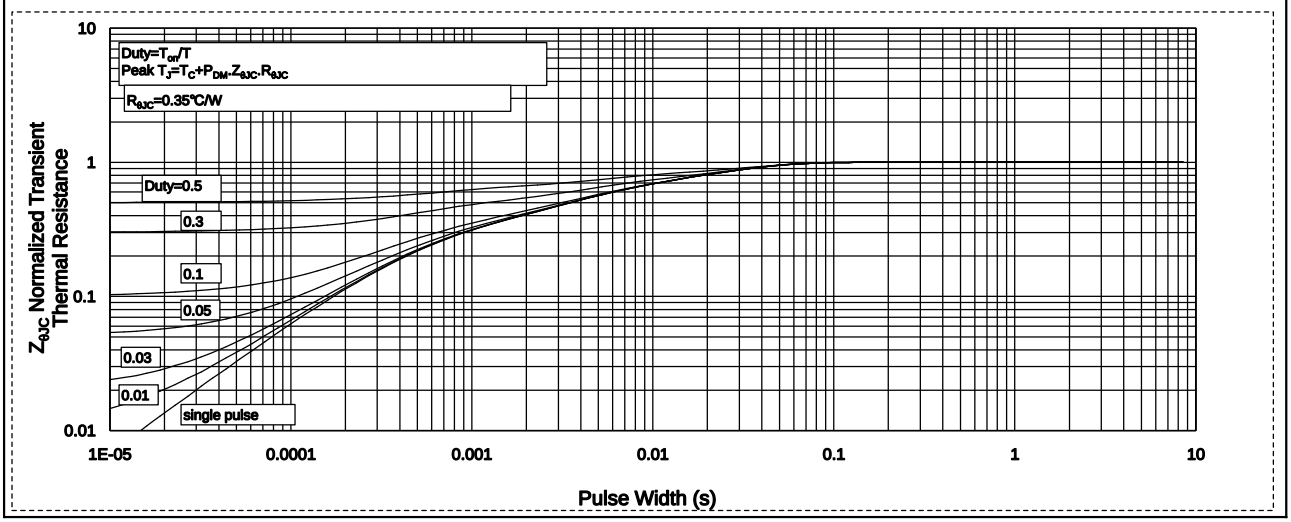
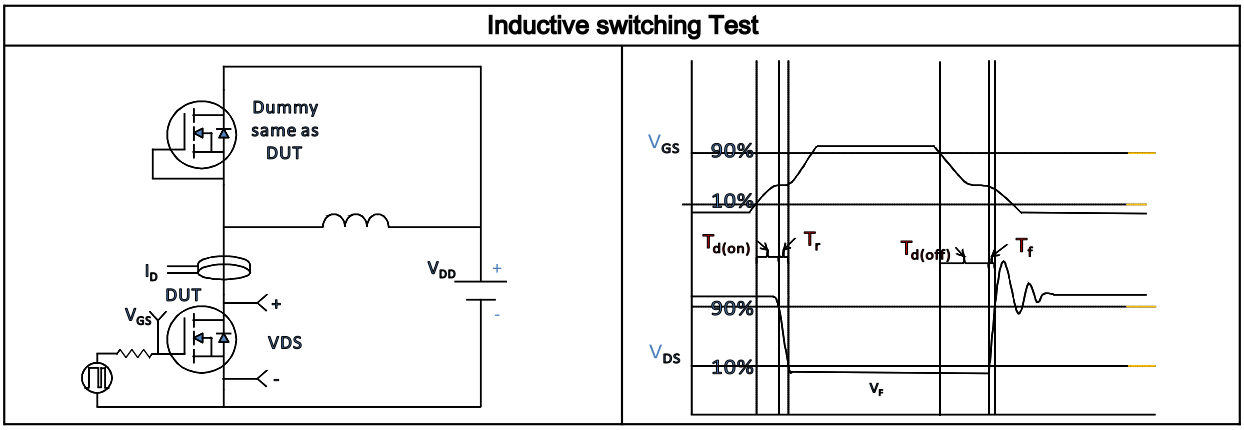


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

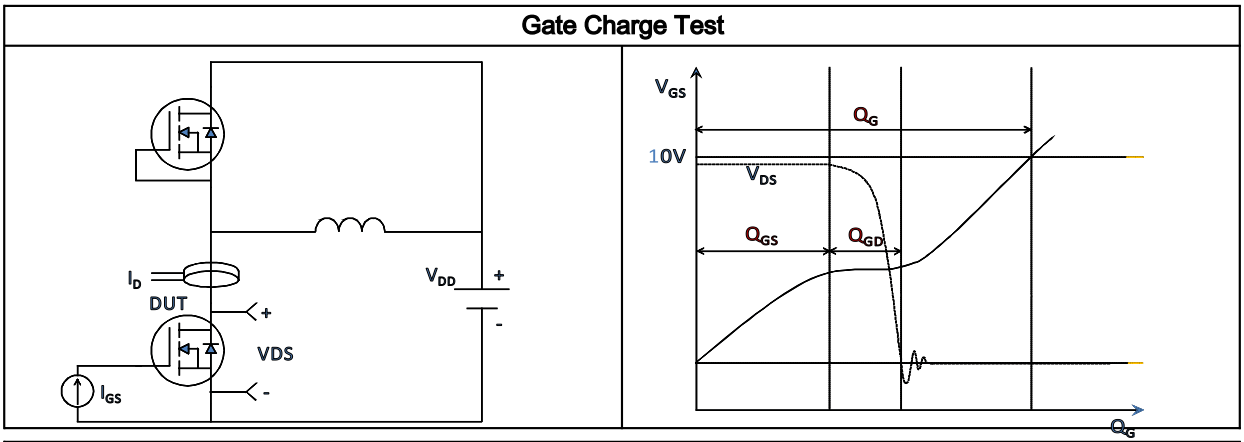


Test Circuit

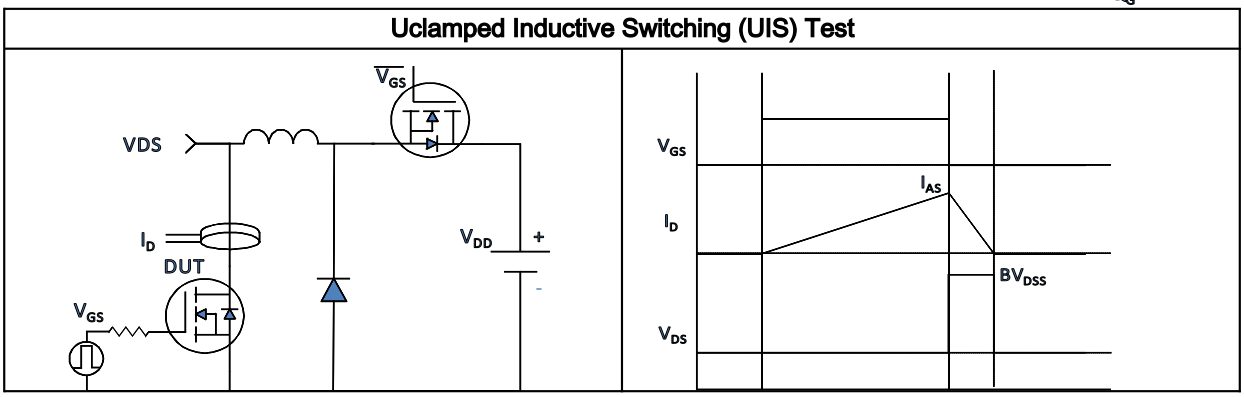
Inductive switching Test



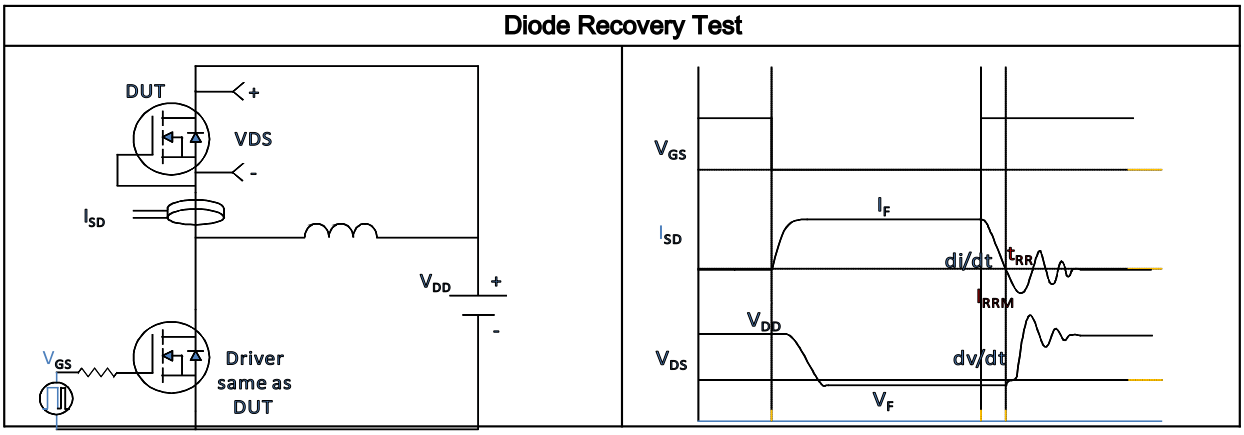
Gate Charge Test



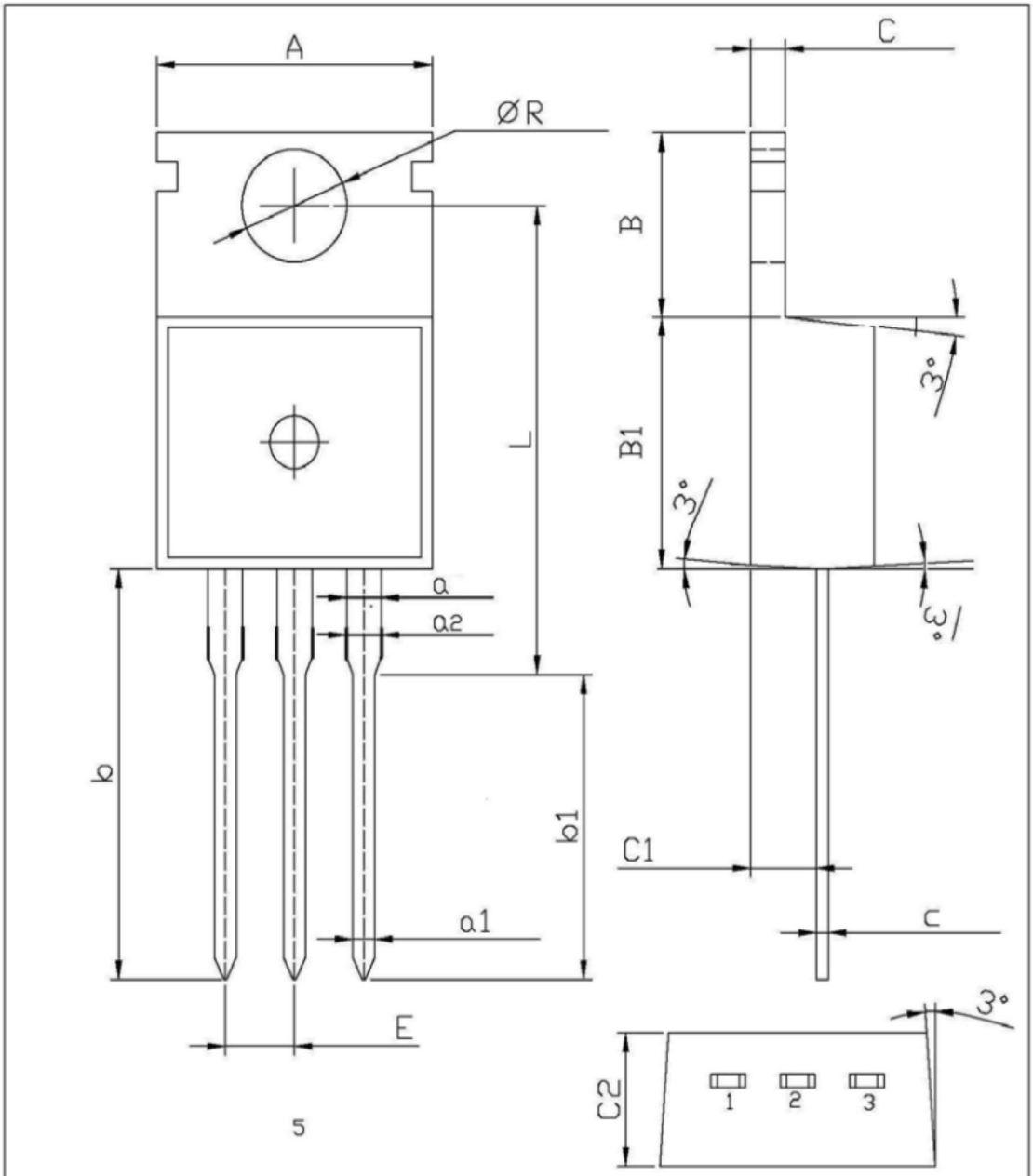
Uclamped Inductive Switching (UIS) Test



Diode Recovery Test



TO220 Package Information



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
L	15.7	16.1	B1	9.0	9.4
b	12.6	13.6	C1	2.2	2.6
b1	9.6	10.6	a1	0.7	0.9
a	1.22	1.32	c	0.4	0.6
E	2.34	2.74	C2	4.3	4.7
a2	1.25	1.45			

Revision History

Revision	Release	Remark
V1.0	2023/02/16	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.

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