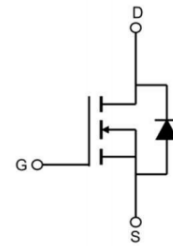


APG029N06K

N-Channel Enhancement Mosfet

Features

- 60V,160A
 $R_{DS(on)} < 2.9m\Omega @ V_{GS}=10V$ TYP:2.4m Ω
 $R_{DS(on)} < 3.6m\Omega @ V_{GS}=4.5V$ TYP:3.0m Ω
- Super Trench
- Extremely low on-resistance RDS(on)
- Excellent Qg x RDS(on) product(FOM)
- Qualified according to JEDEC criteria



Schematic Diagram

Applications

- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)



Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G029N06K	APG029N06K	TO-252	-	-	2500

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V _{DS}	60	V	
Gate-Source Voltage	V _{GS}	±20	V	
Continuous Drain Current (Silicon Limited)	I _D	T _c =25°C	160	A
		T _c =100°C	101	A
Continuous Drain Current (Package Limited) T _c =25°C		80	A	
Pulsed Drain Current	I _{DM}	640	A	
Single Pulsed Avalanche Energy (T _c =25°C, L=0.3mH) ⁽²⁾	E _{AS}	189	mJ	
Drain Power Dissipation	P _D	113	W	
Thermal Resistance from Junction to Case	R _{θJC}	1.11	°C/W	
Thermal Resistance- Junction to Ambient	R _{θJA}	60	°C/W	
Junction Temperature	T _J	150	°C	
Storage Temperature	T _{STG}	-55~ +150	°C	

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25°C unless otherwise noted)

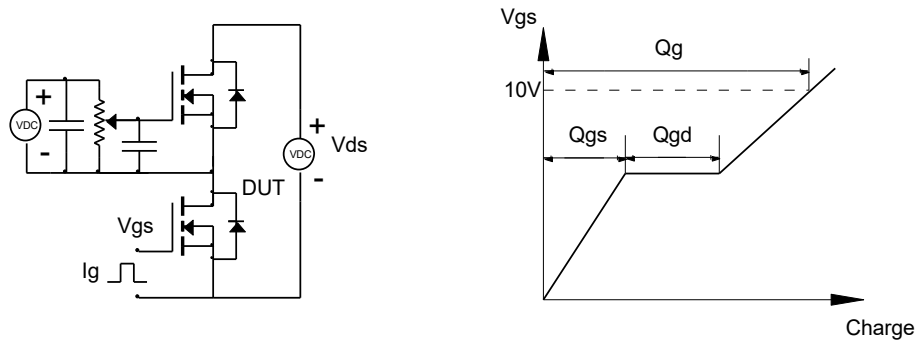
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} = 0V	-	0.02	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	±10	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	-	2.2	V
Drain-source on-resistance ^(a)	R _{DS(on)}	V _{GS} =10V, I _D =40A	-	2.4	2.9	mΩ
		V _{GS} =4.5V, I _D =32A		3.0	3.6	mΩ
Gate Resistance	R _g	V _{GS} =0V, V _{DS} Open, f=1MHz		0.93		Ω
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1.0MHz	-	4610	6915	pF
Output Capacitance	C _{oss}		-	2188	3282	
Reverse Transfer Capacitance	C _{rss}		-	66	132	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =30V, I _D =40A, R _G =2.7Ω, V _G =10V	-	14.1	-	ns
Turn-on rise time	t _r		-	63.7	-	
Turn-off delay time	t _{d(off)}		-	46.8	-	
Turn-off fall time	t _f		-	105.1	-	
Total Gate Charge	Q _g	V _{DS} =30V, I _D =40A, V _{GS} =10V	-	74.4	111.6	nC
Gate-Source Charge	Q _{gs}		-	17.3	-	
Gate-Drain Charge	Q _{gd}		-	9.5	18.9	
Source-Drain Diode characteristics						
Diode Forward voltage ^(a)	V _{SD}	T _J =25°C, V _{GS} =0V, I _S =40A	-	0/82	1.23	V
Diode Forward current	I _S	T _C =25°C	-	-	160	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =40A, di/dt=300A/us		52.8	105.6	ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J =25°C, I _F =440A, di/dt=300A/us		253	56.3	nc

Notes:

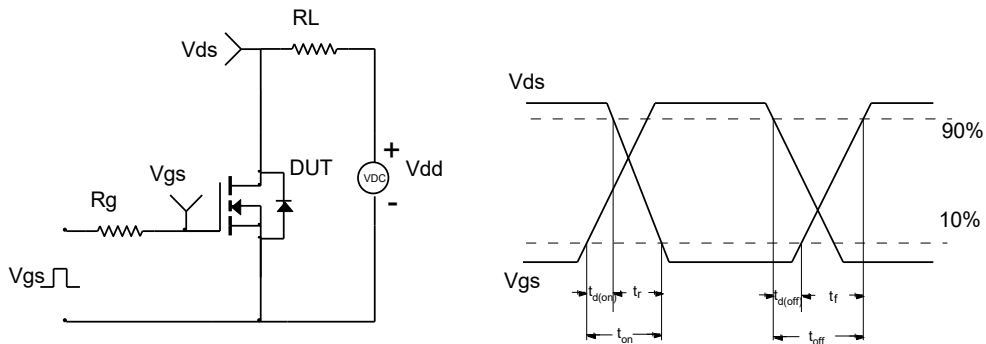
- a) Pulse width ≤ 300 μs, duty cycle ≤ 2%
- b) Guaranteed by design, not subject to production testing

Test Circuit

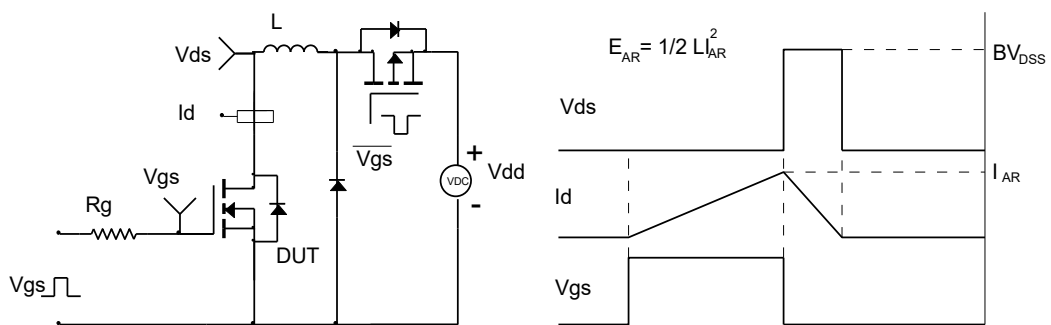
Gate Charge Test Circuit & Waveform



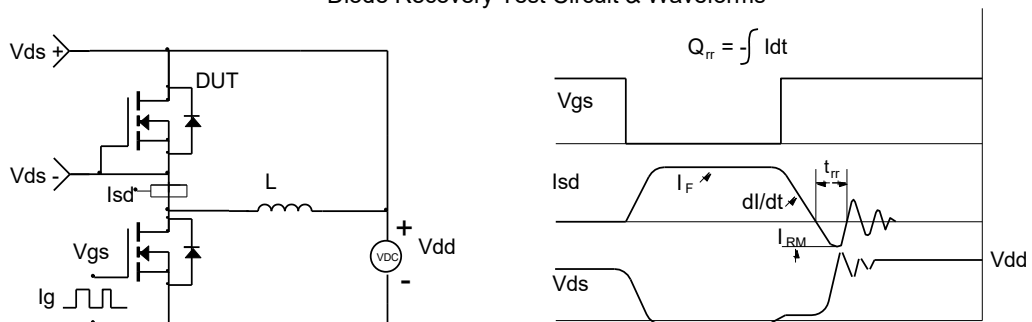
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Fig 1: Output Characteristics

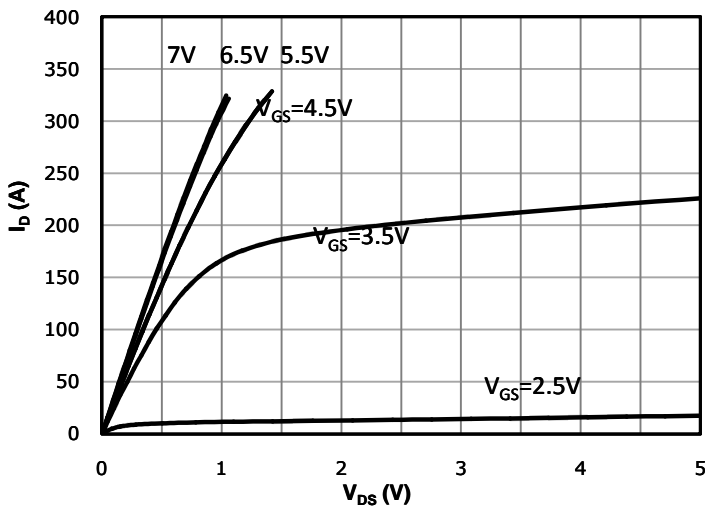


Fig 2: Transfer Characteristics

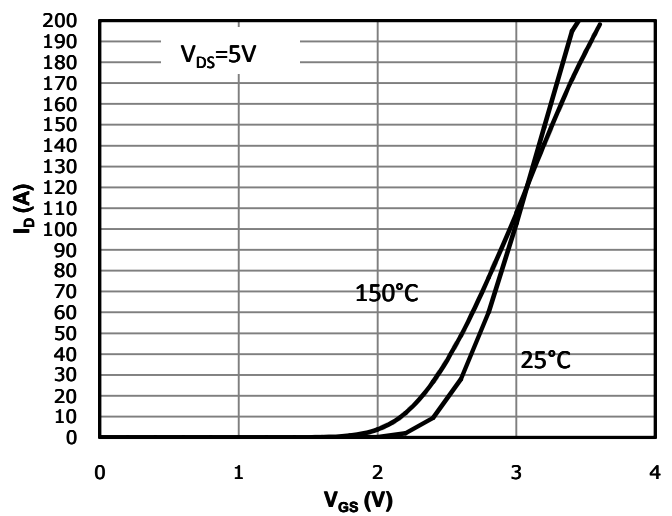


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

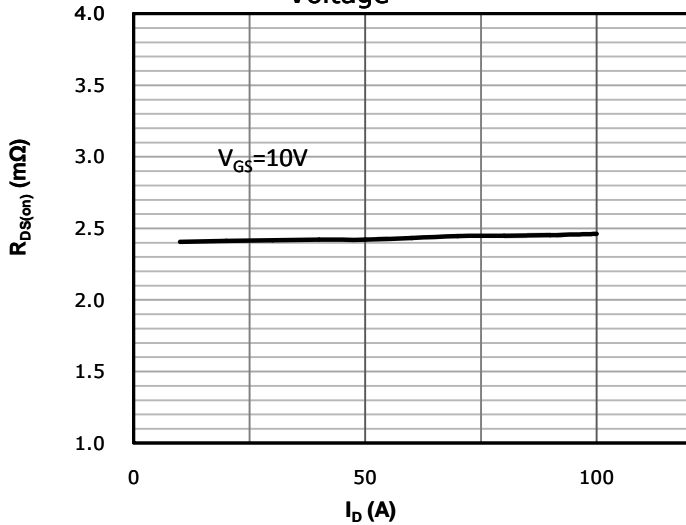


Fig 4: $R_{DS(on)}$ vs Gate Voltage

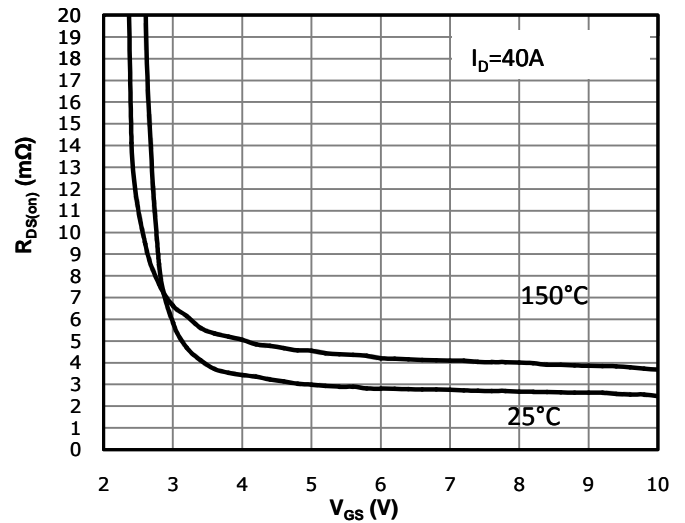


Fig 5: $R_{DS(on)}$ vs. Temperature

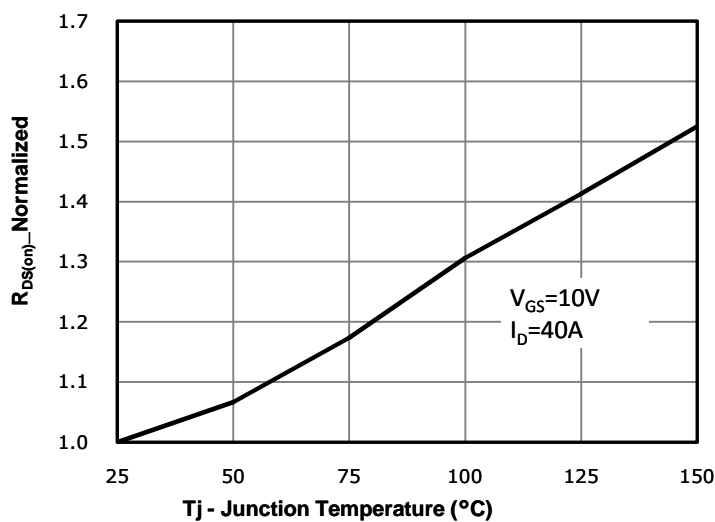
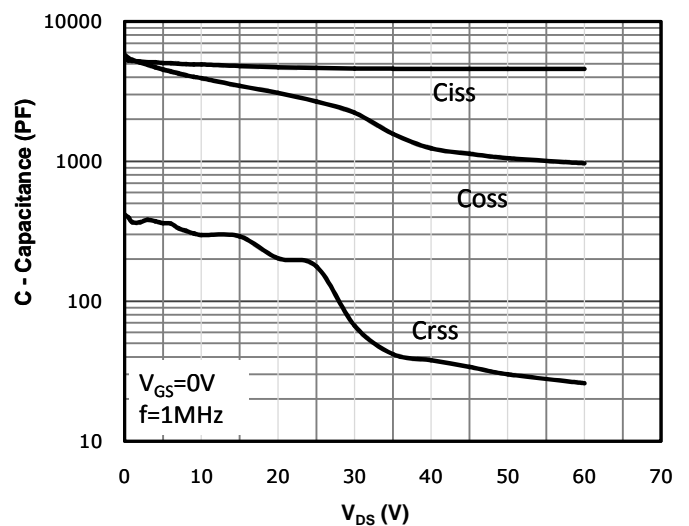


Fig 6: Capacitance Characteristics



Typical Performance Characteristics

Fig 7: Gate Charge Characteristics

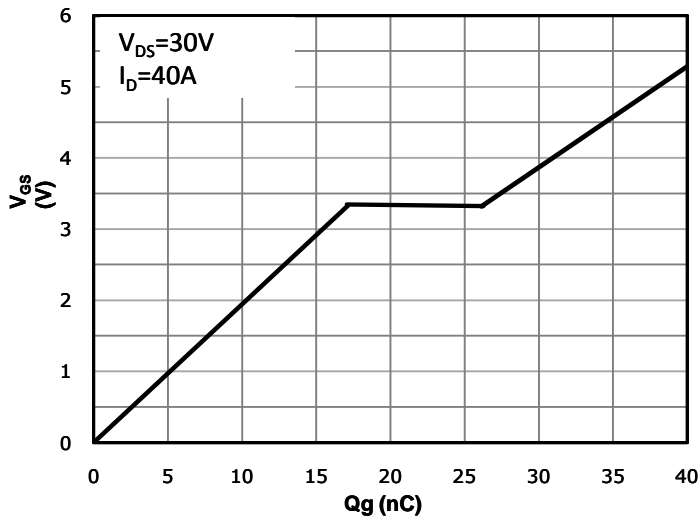


Fig 8: Body-diode Forward Characteristics

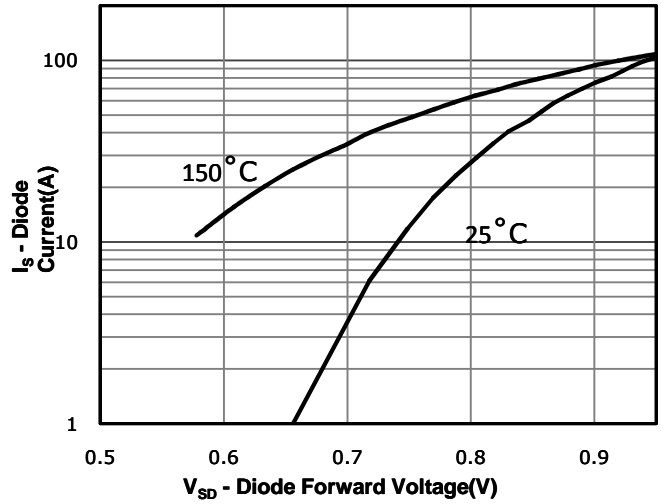


Fig 9: Power Dissipation

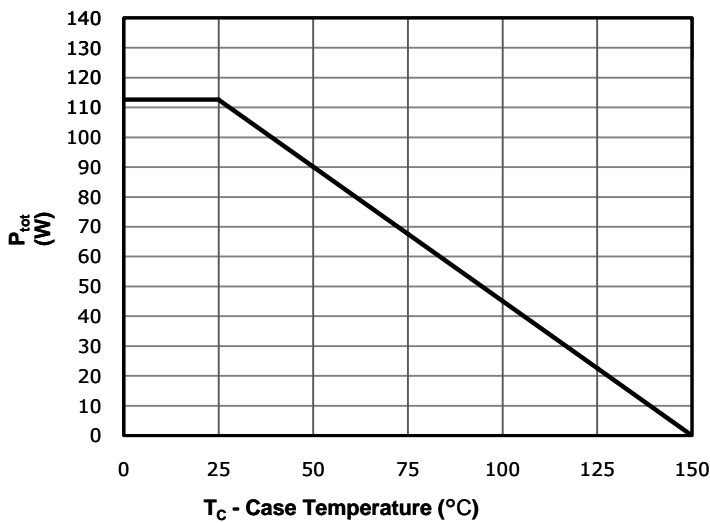


Fig 10: Drain Current Derating

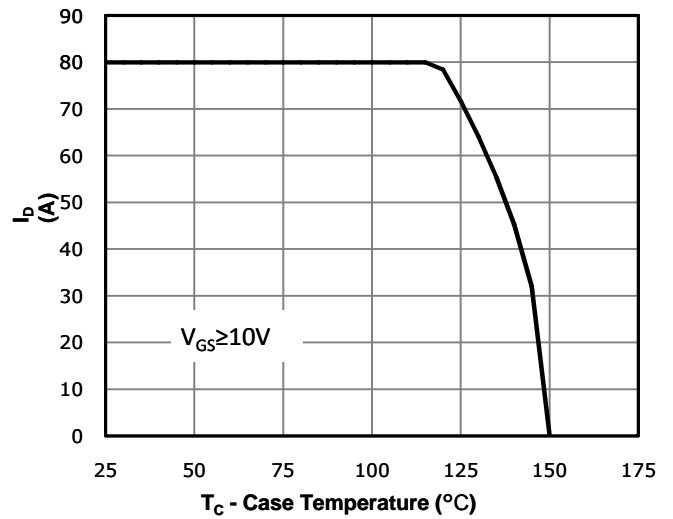
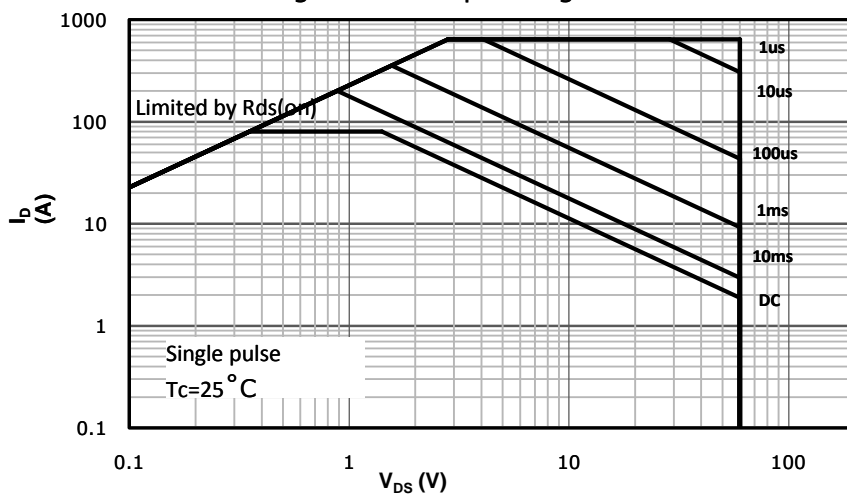
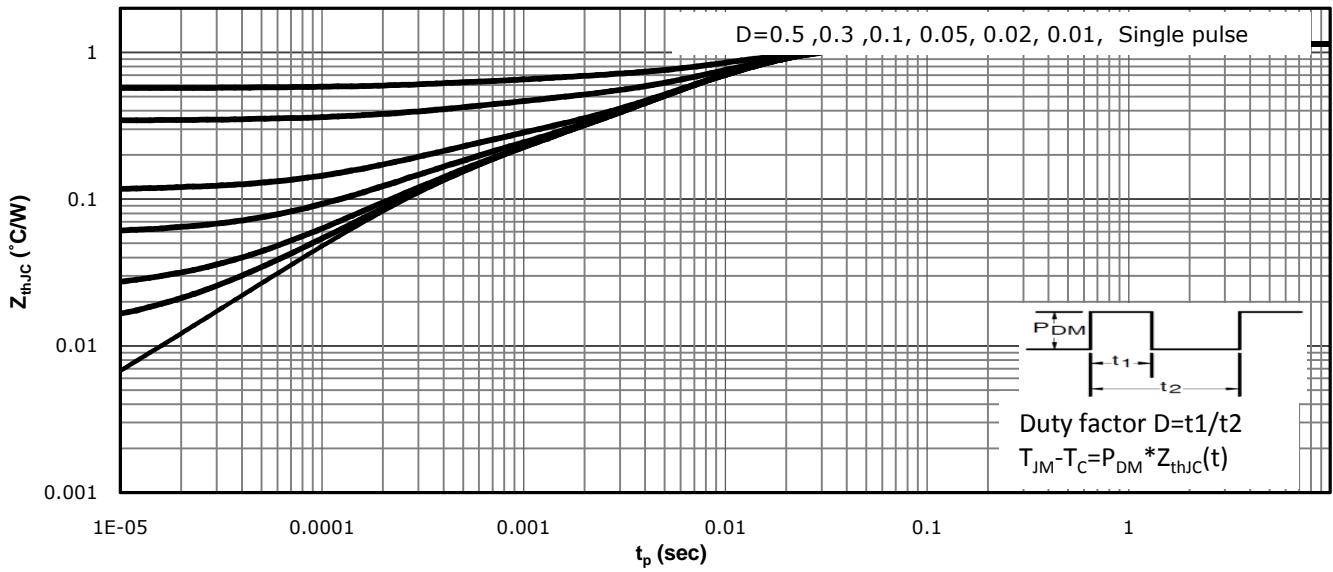


Fig 11: Safe Operating Area

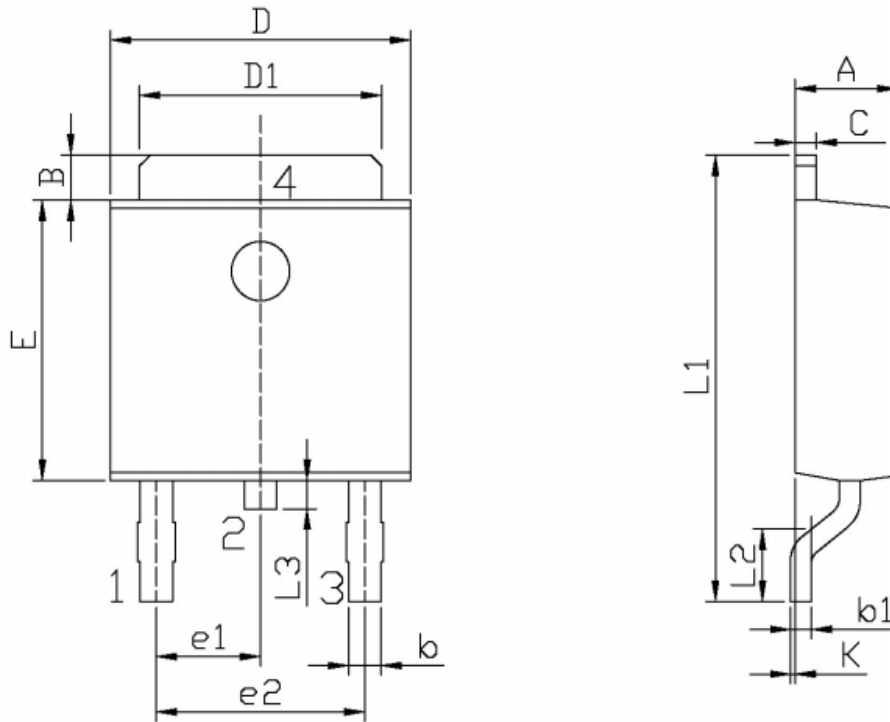


Typical Performance Characteristics

Fig 12: Max. Transient Thermal Impedance



TO-252 Package Information



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

Revision History

Revision	Release	Remark
V1.0	2023/05/17	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.