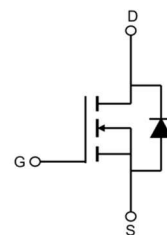


Features

- 150V,20A
 $R_{DS(ON)} < 75m\Omega @ V_{GS}=10V$ TYP:58m Ω
 $R_{DS(ON)} < 80m\Omega @ V_{GS}=7V$ TYP:62m Ω
- Advanced Trench MOS technology
- Extremely low on-resistance RDS(on)
- Excellent Qg x RDS(on) product(FOM)



Schematic Diagram

Applications

- Motor control and drive
- 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)
20N15K	AP20N15K	TO-252	-	-	2500

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	150	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current ⁽¹⁾	T _c =25°C	I _D	20	A
Continuous Drain Current	T _c =100°C	I _D	12.6	A
Pulsed Drain Current		I _{DM}	80	A
Single Pulsed Avalanche Energy (V _{DD} =50V,L=0.3mH)		E _{AS}	7	mJ
Drain Power Dissipation		P _D	88	W
Thermal Resistance from Junction to Case		R _{θJC}	1.42	°C/W
Thermal Resistance- Junction to Ambient		R _{θJA}	105	°C/W
Junction Temperature		T _J	150	°C
Storage Temperature		T _{STG}	-55~ +150	°C

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

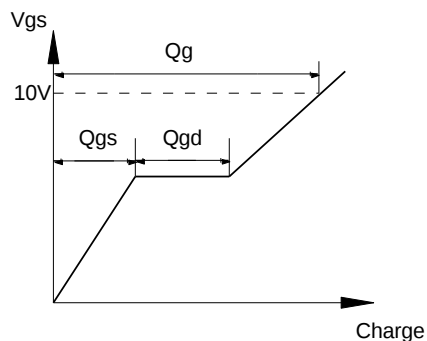
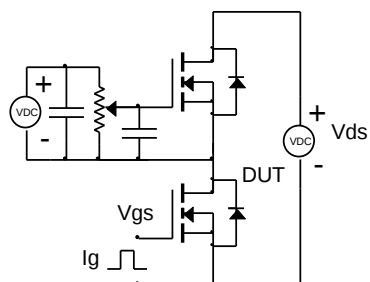
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	150	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =150V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3.4	4	4.6	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A	-	58	75	mΩ
		V _{GS} =7V, I _D =5A		62	80	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f =1.0MHz	-	1184	-	pF
Output Capacitance	C _{oss}		-	60	-	
Reverse Transfer Capacitance	C _{rss}		-	37	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =75V, I _D =10A, R _G =2.7Ω, V _G =10V	-	14	-	ns
Turn-on rise time	t _r		-	33	-	
Turn-off delay time	t _{d(off)}		-	23	-	
Turn-off fall time	t _f		-	22	-	
Total Gate Charge	Q _g	V _{DS} =75V, I _D =10A, V _{GS} =10V	-	27	-	nC
Gate-Source Charge	Q _{gs}		-	8	-	
Gate-Drain Charge	Q _{gd}		-	8.9	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _J =25℃, V _{GS} =0V, I _S =10A	-	0.8	1.3	V
Diode Forward current	I _S	T _C =25℃	-	-	20	A
Body Diode Reverse Recovery Time	trr	T _J =25℃ , IF=10A,di/dt=100A/us		53		ns
Body Diode Reverse Recovery Charge	Qrr	T _J =25℃ , IF=10A,di/dt=100A/us		89		uc

Notes:

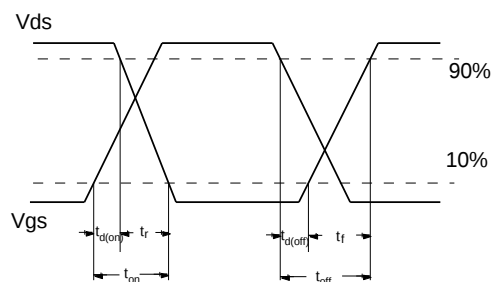
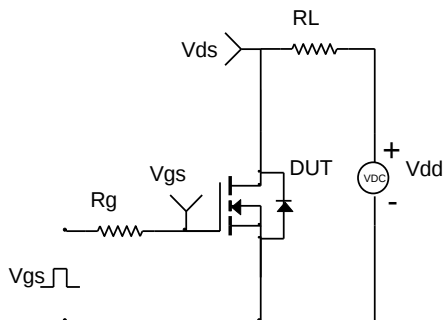
1. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.
3. Surface mounted on 1 in² pad area, $t \leq 10$ sec.

Test Circuit

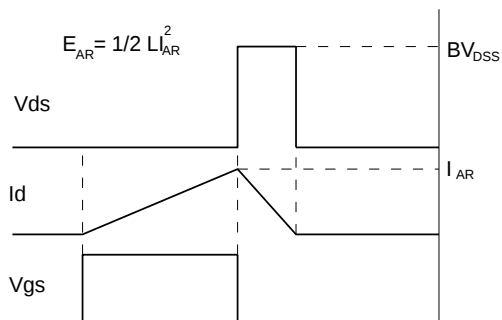
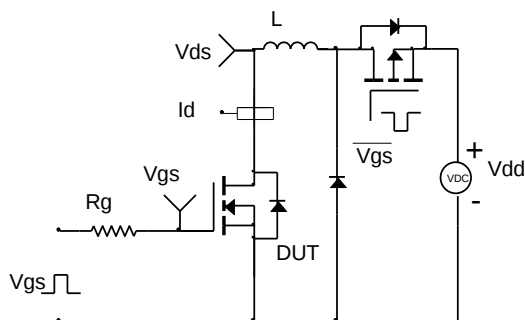
Gate Charge Test Circuit & Waveform



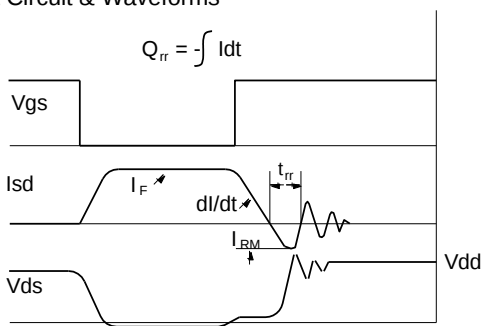
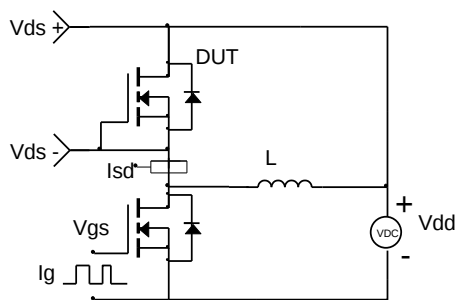
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

Fig 1: Output Characteristics

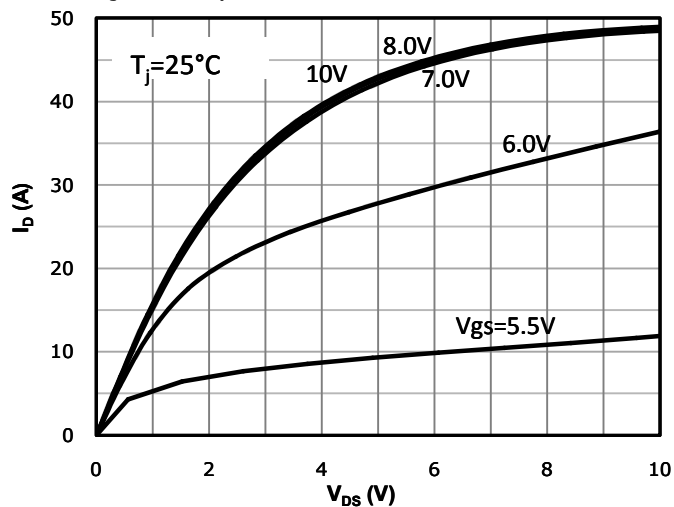


Fig 2: Transfer Characteristics

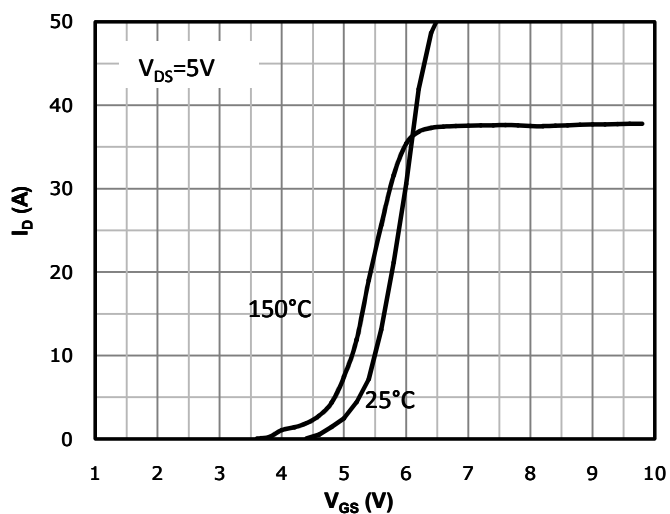


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

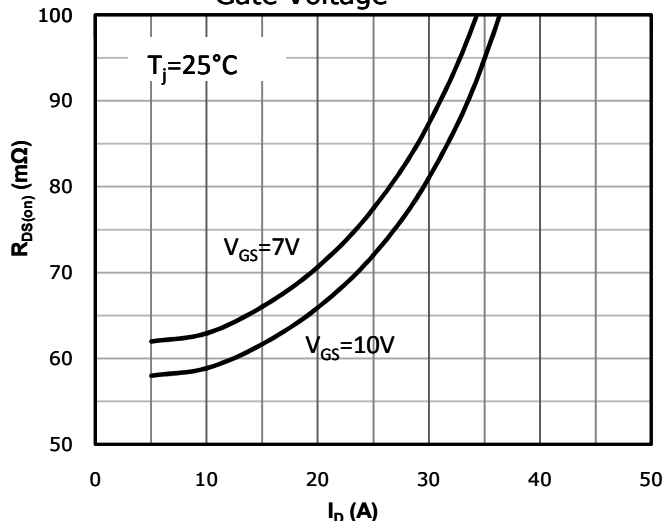


Fig 4: $R_{DS(on)}$ vs Gate Voltage

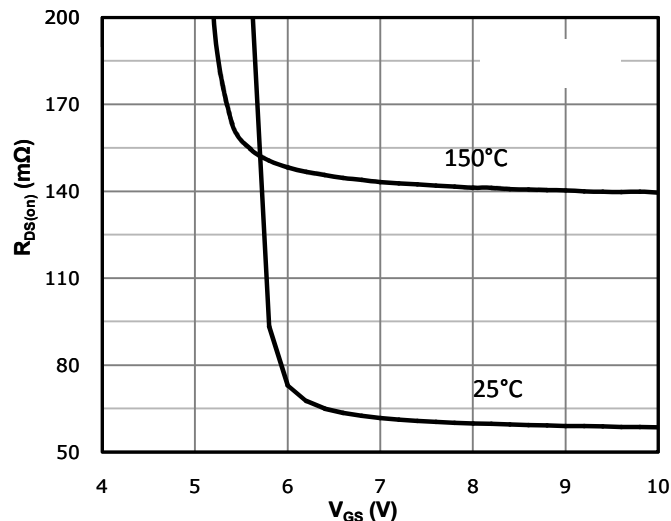


Fig 5: $R_{DS(on)}$ vs. Temperature

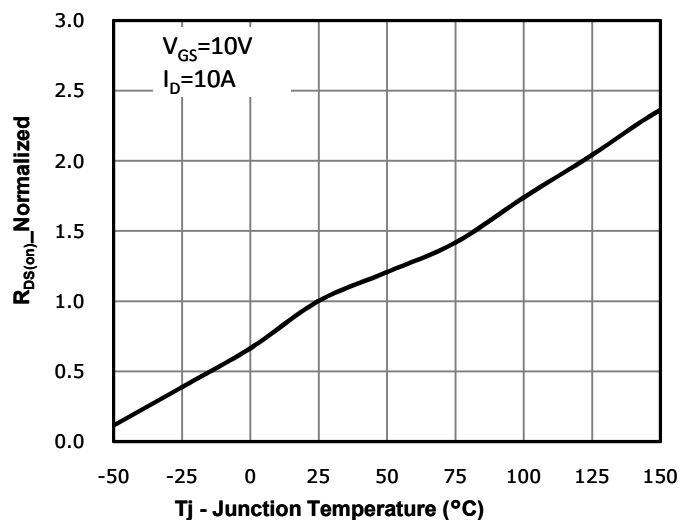
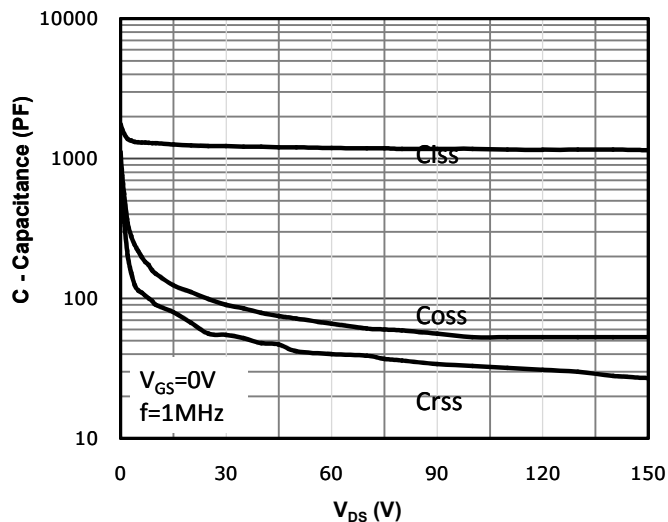


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

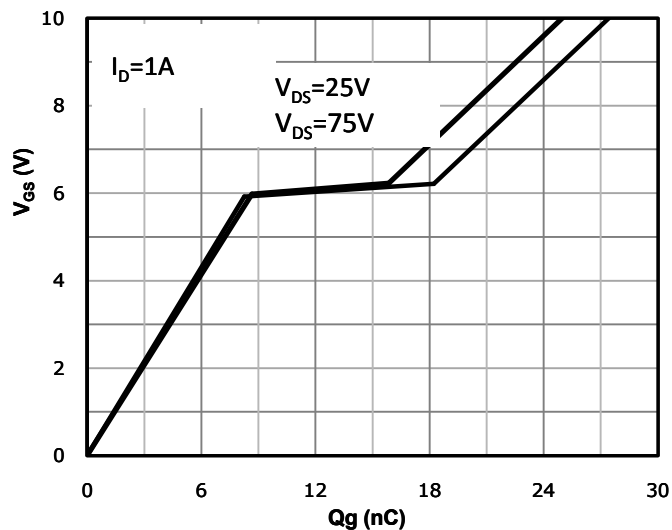


Fig 8: Body-diode Forward Characteristics

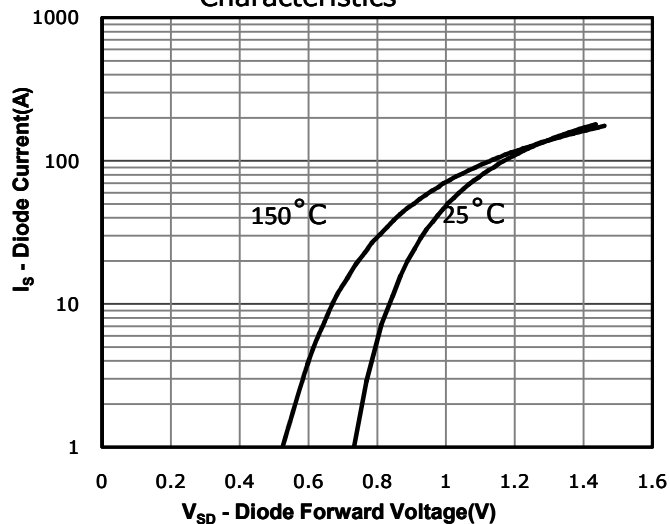


Fig 9: Power Dissipation

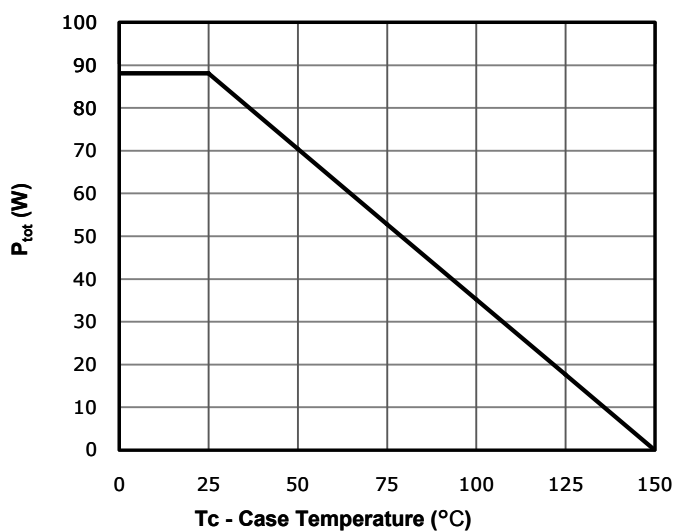


Fig 10: Drain Current Derating

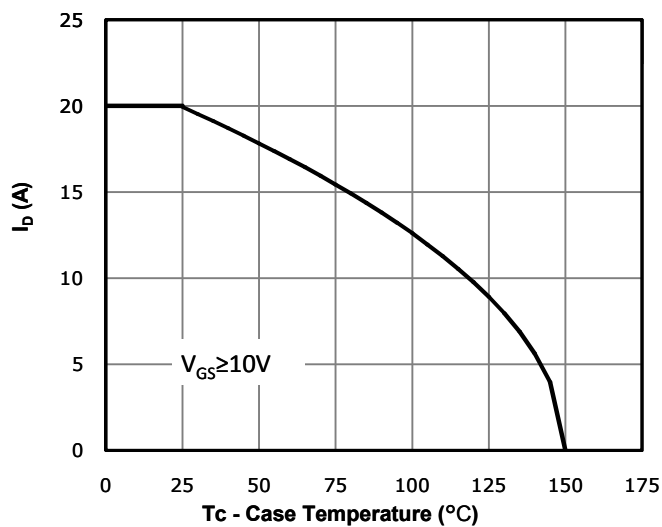
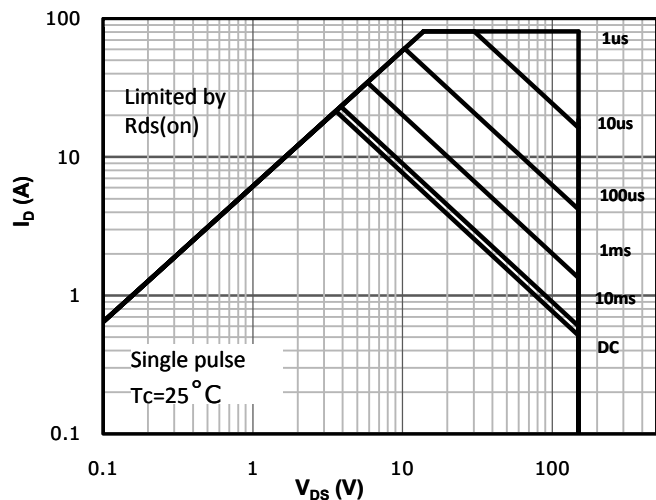
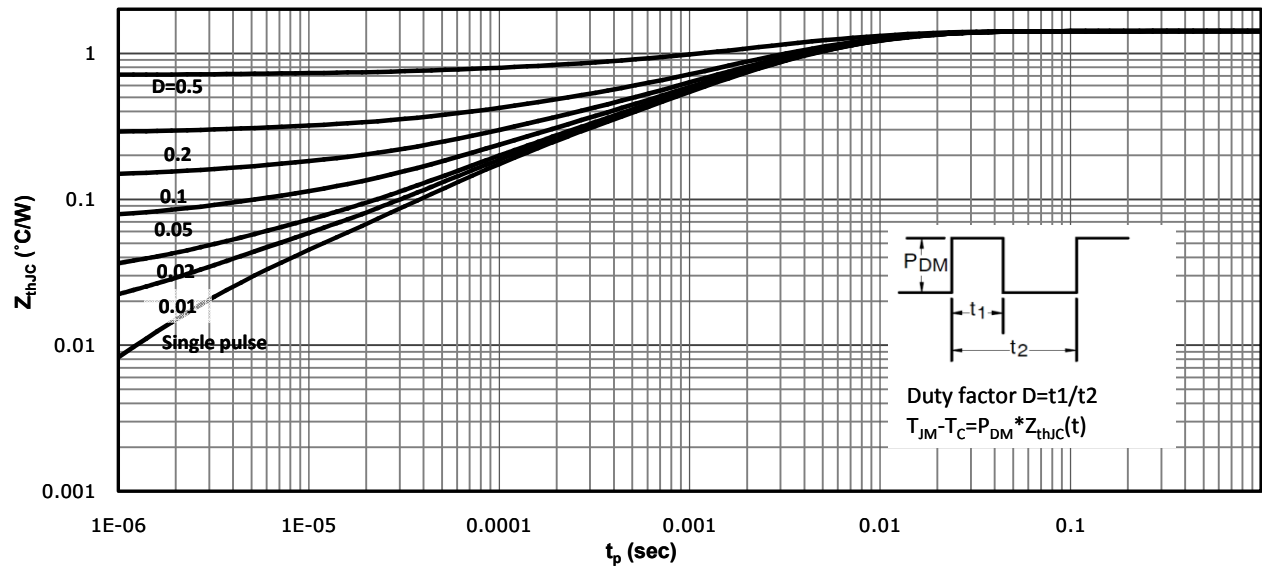


Fig 11: Safe Operating Area



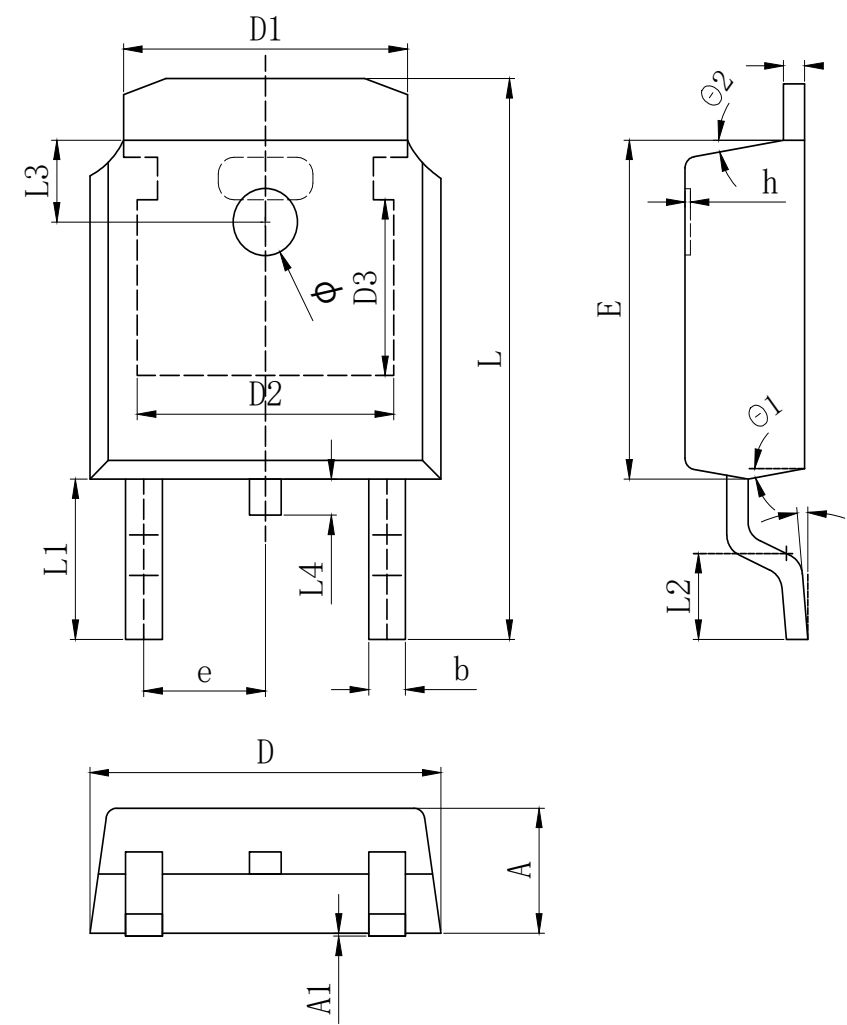
Typical Characteristics

Fig 12: Max. Transient Thermal Impedance



AP20N15K
N-Channel Enhancement Mosfet

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ 1	9° TYP		
θ 2	9° TYP		

Revision History

Revision	Release	Remark
V1.0	2024/05/11	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.