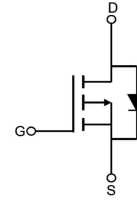


Feature

- -20V,2A
 $R_{DS(ON)} < 125m\Omega @ V_{GS} = -4.5V$ TYP:95 m Ω
 $R_{DS(ON)} < 190m\Omega @ V_{GS} = -2.5V$ TYP:135 m Ω
- Advanced Trench Technology
- Lead free product is acquired



Schematic Diagram

Application

- Interfacing Switching
- Load Switching
- Power management



SOT-323 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
150P20	AP150P20N3	Sot-323	7 inch	-	3000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_a = 25^\circ\text{C}$)	I_D	-2	A
Continuous Drain Current ($T_a = 70^\circ\text{C}$)	I_D	-1.3	A
Pulsed Drain Current	I_{DM}	-8	A
Power Dissipation	P_D	0.25	W
Thermal Resistance from Junction to Ambient ⁽⁴⁾	$R_{\theta JA}$	500	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

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

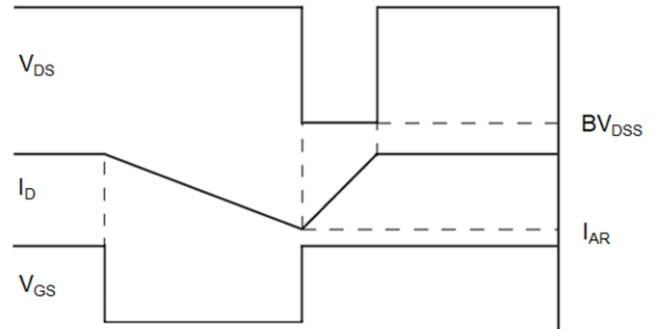
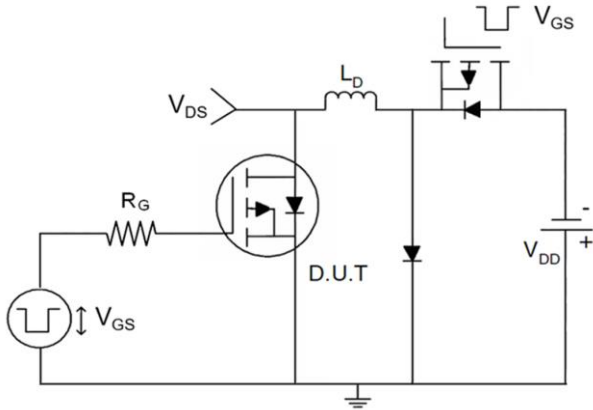
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.3	-0.7	-1.0	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -4.5V, I _D = -2A	-	95	125	mΩ
		V _{GS} = -2.5V, I _D = -1A	-	135	190	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz	-	184	-	pF
Output Capacitance	C _{oss}		-	35	-	
Reverse Transfer Capacitance	C _{rss}		-	25	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} = -10V, I _D = -2A, V _{GS} = -4.5V, R _G = 3Ω	-	10	-	ns
Turn-on rise time	t _r		-	30	-	
Turn-off delay time	t _{d(off)}		-	63	-	
Turn-off fall time	t _f		-	50	-	
Total Gate Charge	Q _g	V _{DS} = -10V, I _D = -2A, V _{GS} = -4.5V	-	2.2	-	nC
Gate-Source Charge	Q _{gs}		-	0.5	-	
Gate-Drain Charge	Q _{gd}		-	0.5	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} = 0V, I _S = -2A	-	-	-1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	-2	A

Notes:

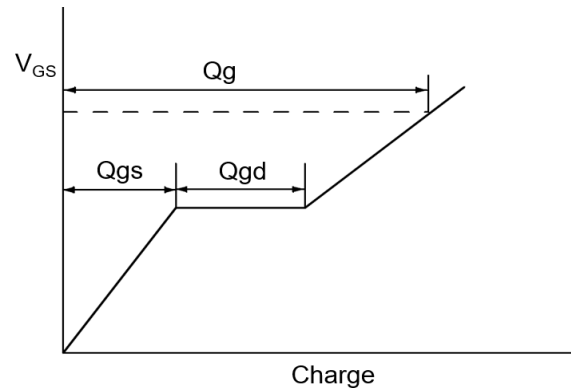
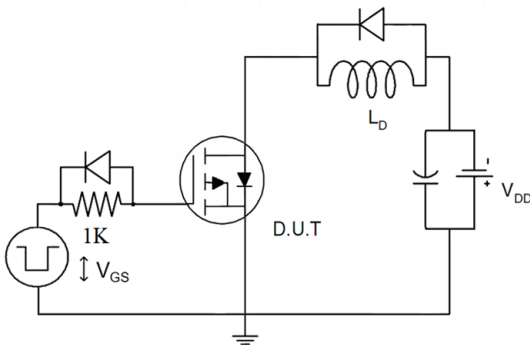
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
3. Surface Mounted on FR4 Board, t ≤ 10 sec

Test Circuit

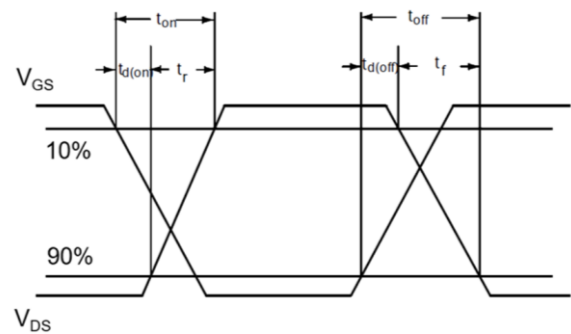
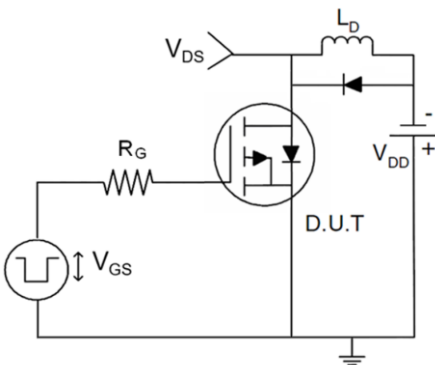
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Performance Characteristics

Figure 1: Output Characteristics

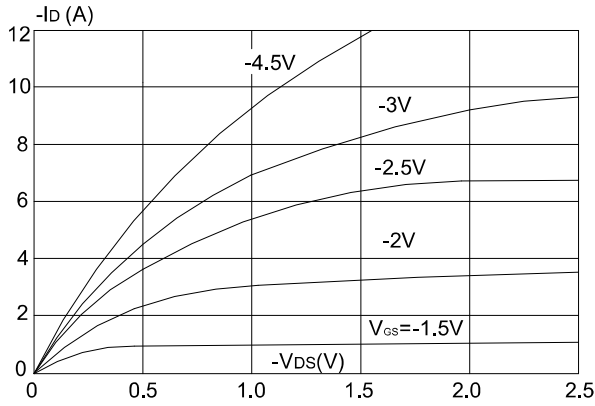


Figure 2: Typical Transfer Characteristics

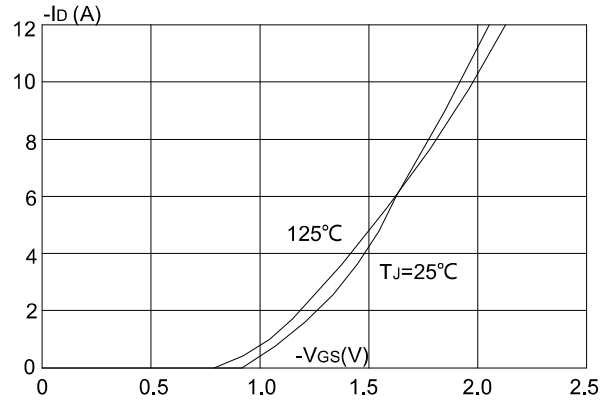


Figure 3: On-resistance vs. Drain Current

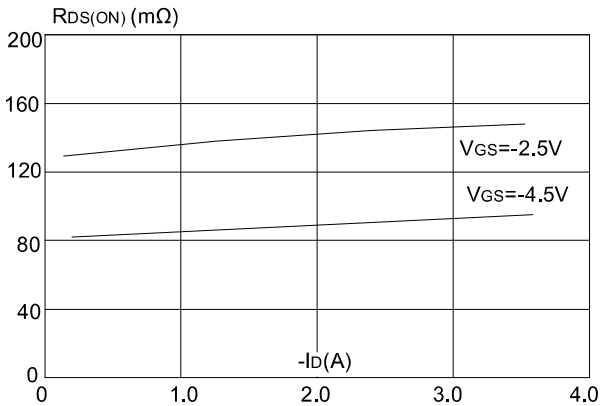


Figure 4: Body Diode Characteristics

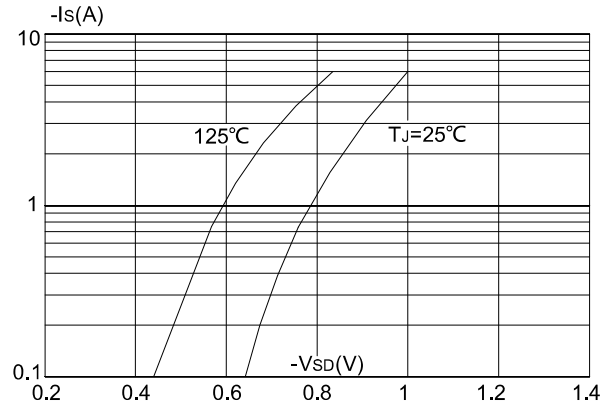


Figure 5: Gate Charge Characteristics

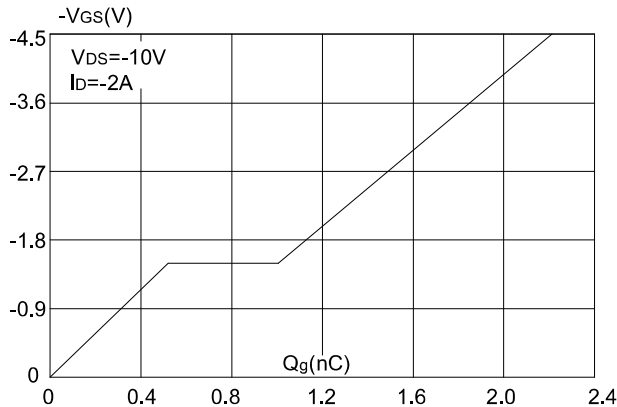


Figure 6: Capacitance Characteristics

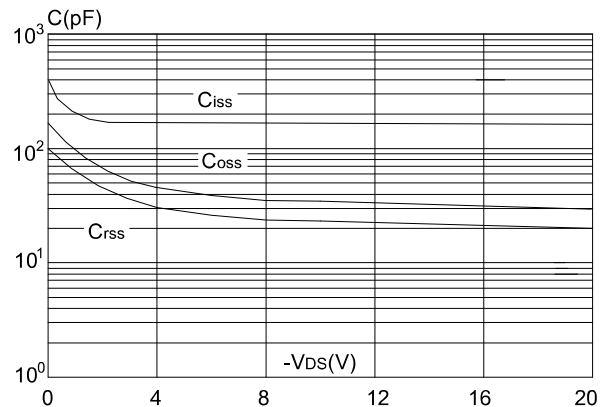


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

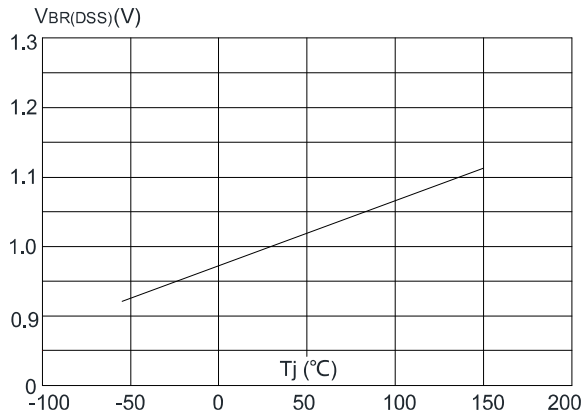


Figure 8: Normalized on Resistance vs. Junction Temperature

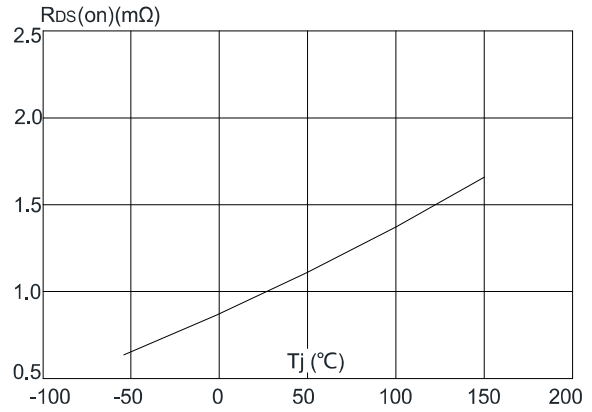


Figure 9: Maximum Safe Operating Area

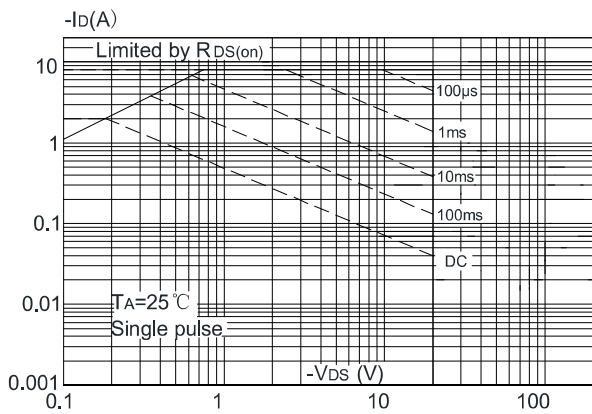


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

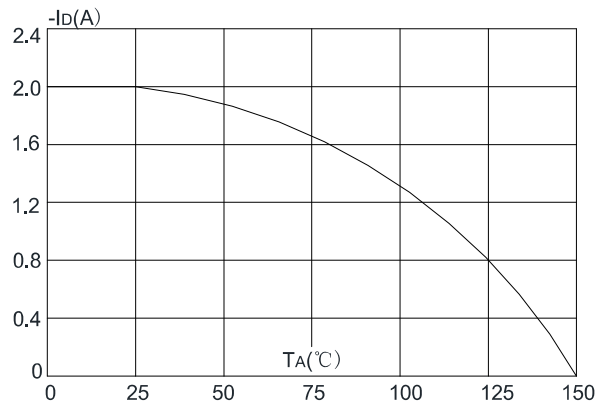
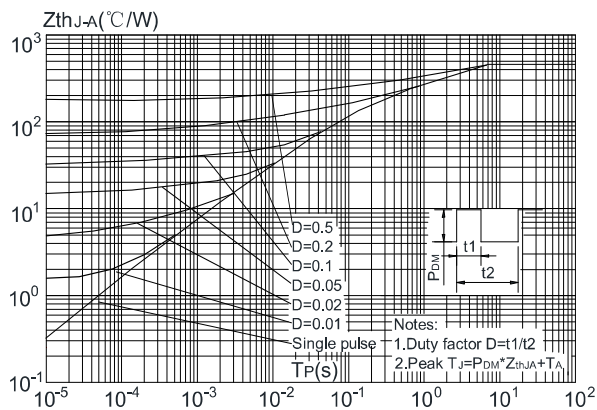
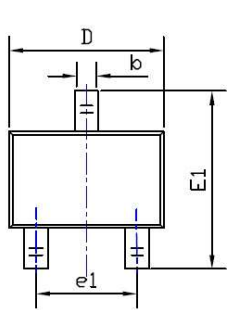


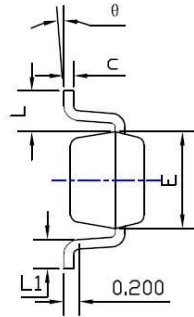
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



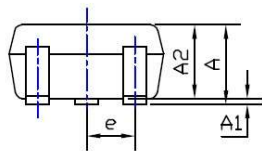
SOT-323 Package Information



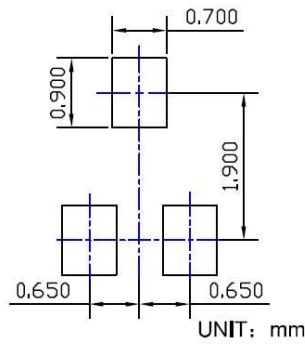
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	----	0.043	0.900	----	1.100
A1	0.000	----	0.004	0.000	----	0.100
A2	0.035	0.037	0.039	0.900	0.950	1.000
b	0.006	0.012	0.016	0.150	0.300	0.400
c	0.004	----	0.010	0.100	----	0.250
D	0.071	0.079	0.087	1.800	2.000	2.200
E	0.045	0.049	0.053	1.150	1.250	1.350
E1	0.085	0.091	0.096	2.150	2.300	2.450
e	0.026 TYP			0.650 TYP		
e1	0.047	0.051	0.055	1.200	1.300	1.400
L	0.021 REF			0.525 REF		
L1	0.010	0.014	0.018	0.260	0.360	0.460
theta	0°	----	8°	0°	----	8°

NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.