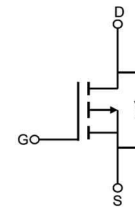


Feature

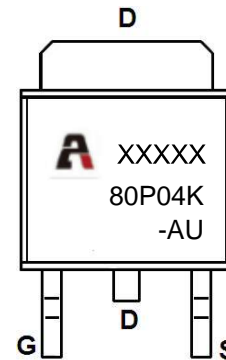
- -40V,-80A
 $R_{DS(ON)} < 7m\Omega @ V_{GS} = -10V$ TYP:5.8 m Ω
 $R_{DS(ON)} < 9m\Omega @ V_{GS} = -4.5V$ TYP:7.5 m Ω
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- AEC-Q101 qualified

Application

- PWM applications
- Load Switch
- Power management



Schematic Diagram



Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
80P04K-AU	AP80P04K-AU	TO-252	13 inch	-	2500

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^\circ\text{C}$)	I_D	-80	A
Continuous Drain Current ($T_c=100^\circ\text{C}$)	I_D	-50	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-300	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	400	mJ
Power Dissipation	P_D	74	W
Thermal Resistance- Junction to Case	$R_{\theta JC}$	1.68	$^\circ\text{C/W}$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	56	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

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

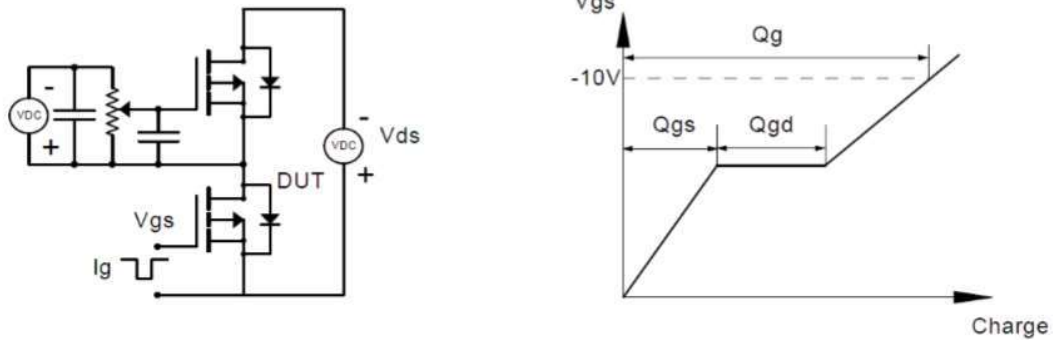
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.6	-2.5	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$	-	5.8	7	m Ω
		$V_{GS} = -4.5V, I_D = -10A$	-	7.5	9	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V, f = 1MHz$	-	5400	-	pF
Output Capacitance	C_{oss}		-	700	-	
Reverse Transfer Capacitance	C_{rss}		-	530	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -20V, I_D = -20A, R_L = 1\Omega$ $V_{GS} = -10V, R_G = 3\Omega$	-	20	-	ns
Turn-on rise time	t_r		-	42	-	
Turn-off delay time	$t_{d(off)}$		-	106	-	
Turn-off fall time	t_f		-	58	-	
Total Gate Charge	Q_g	$V_{DS} = -20V, I_D = -20A,$ $V_{GS} = -10V$	-	84	-	nC
Gate-Source Charge	Q_{gs}		-	14.6	-	
Gate-Drain Charge	Q_{gd}		-	17	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = -20A$	-	-	-1.2	V
Diode Forward current ⁽⁴⁾	I_S		-	-	-80	A

Notes:

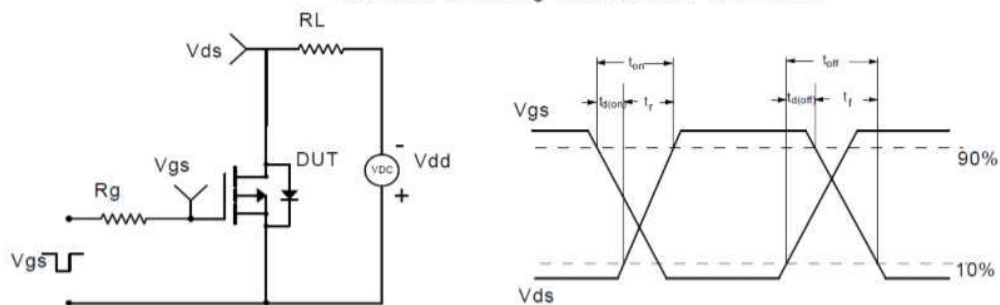
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = -20V, R_G = 25\Omega, L = 0.5\text{mH}, I_{AS} = -40A$
3. Pulse Test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10\text{ sec}$

Test Circuit

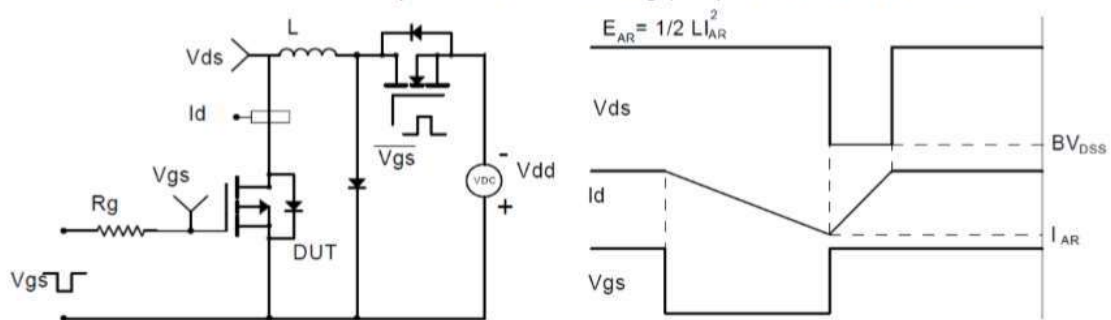
Gate Charge Test Circuit & Waveform



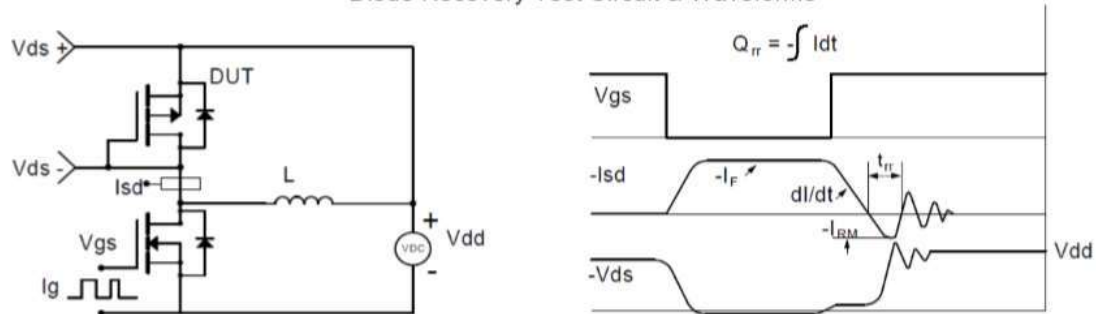
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Figure 1: Output Characteristics

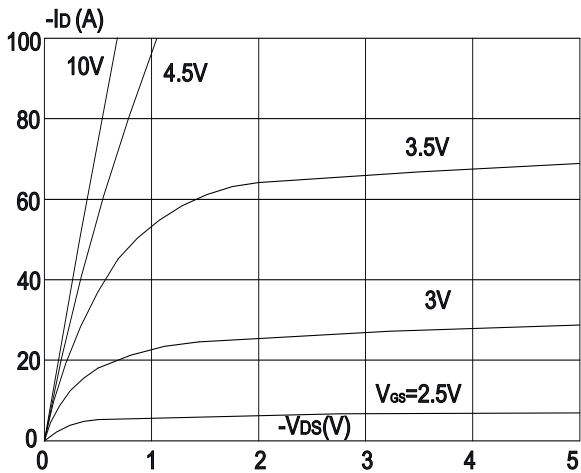


Figure 2: Typical Transfer Characteristics

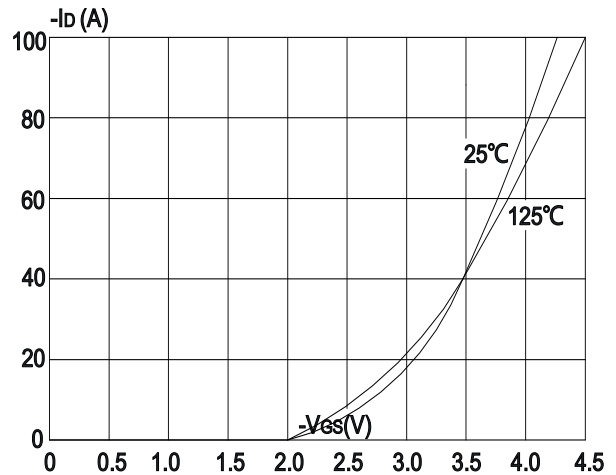


Figure 3: On-resistance vs. Drain Current

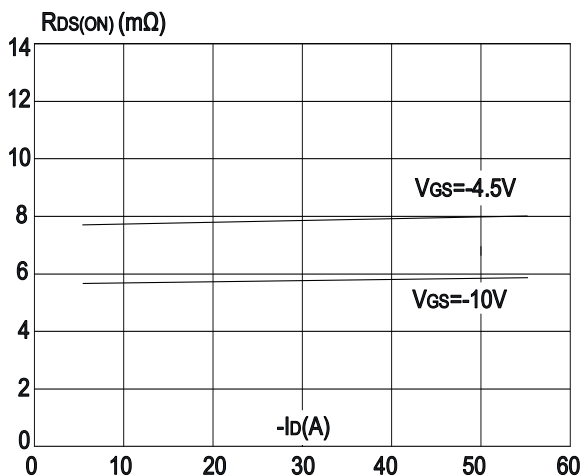


Figure 4: Body Diode Characteristics

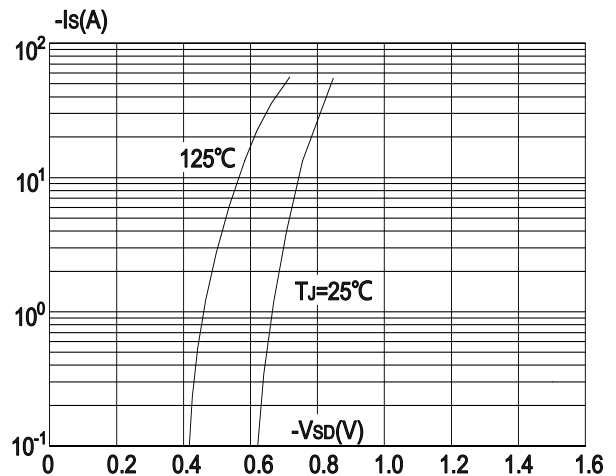


Figure 5: Gate Charge Characteristics

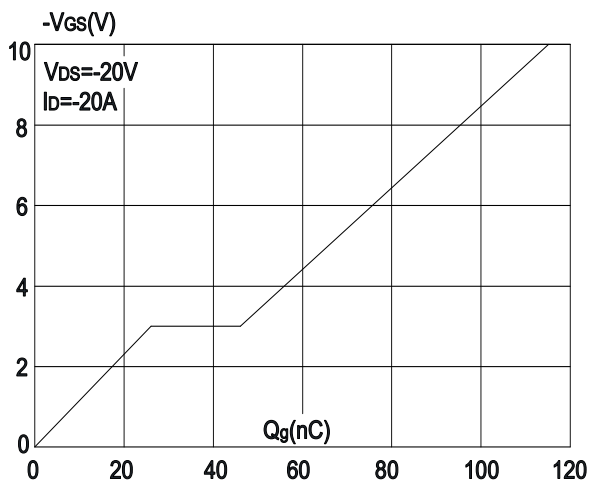
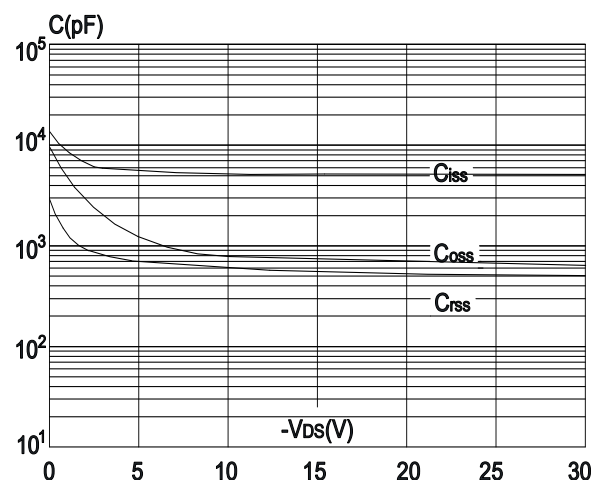


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

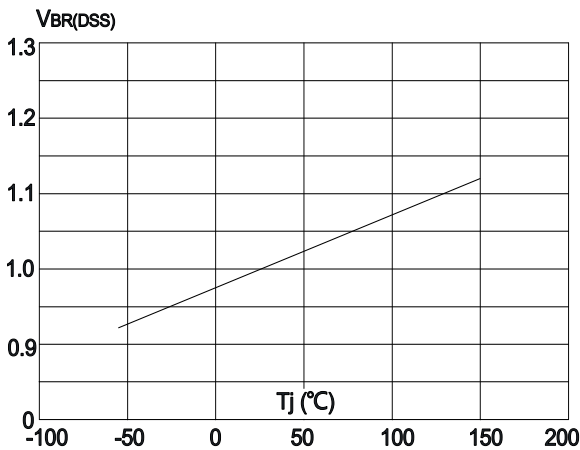


Figure 8: Normalized on Resistance vs. Junction Temperature

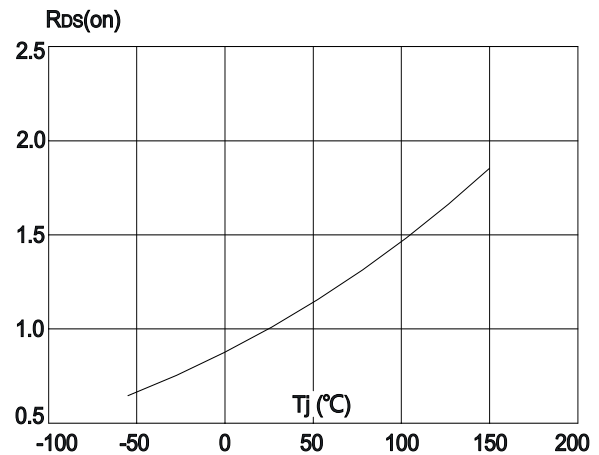


Figure 9: Maximum Safe Operating Area

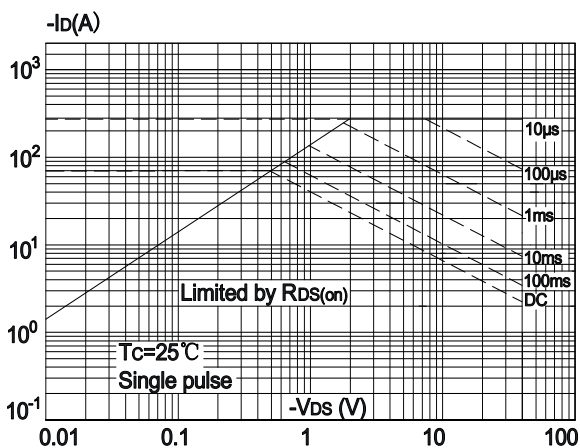


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

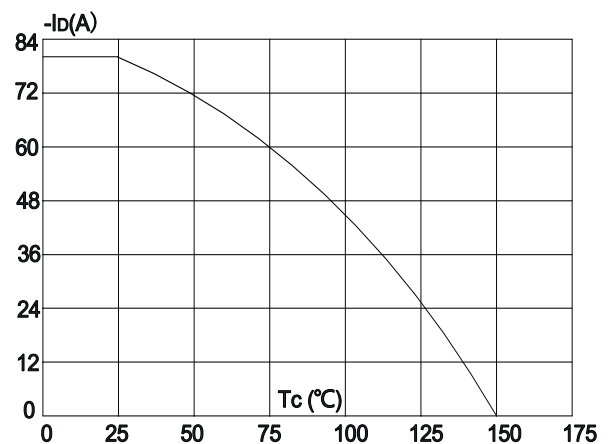
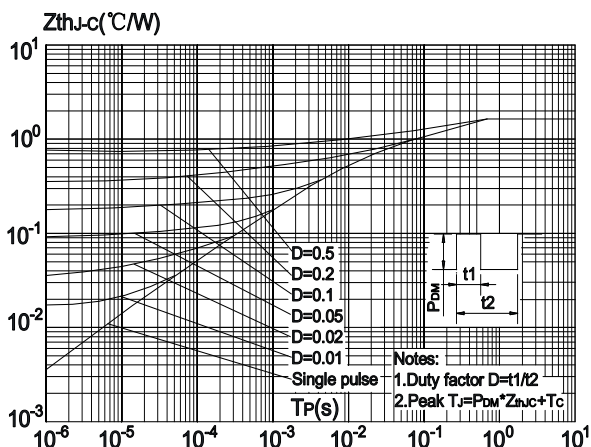
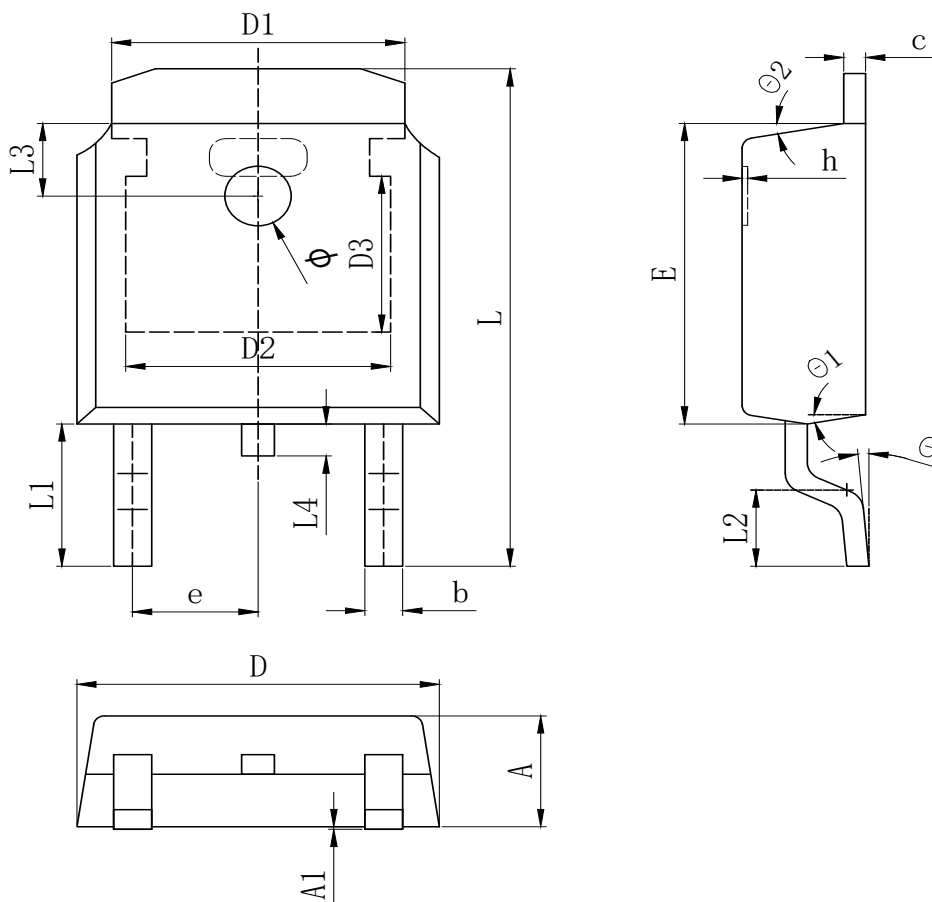


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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°
θ1	9° TYP		
θ2	9° TYP		