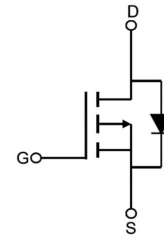


# AP3407

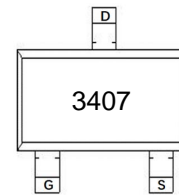
## P-Channel Enhancement Mosfet

### Feature

- -30V, -4.1A  
 $R_{DS(ON)} < 70m\Omega @ V_{GS} = -10V$  TYP=54 m $\Omega$   
 $R_{DS(ON)} < 95m\Omega @ V_{GS} = -4.5V$  TYP=80 m $\Omega$
- Advanced Trench Technology
- Excellent RDS(ON) and Low Gate Charge
- Lead free product is acquired



Schematic Diagram



Marking and pin Assignment

### Application

- PWM Applications
- Load Switch
- Power Management

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3407	AP3407	SOT-23		-	3000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_a = 25^\circ\text{C}$ )	$I_D$	-4.1	A
Continuous Drain Current ( $T_a = 100^\circ\text{C}$ )	$I_D$	-2.7	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	-16.4	A
Power Dissipation	$P_D$	1.4	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	89	$^\circ\text{C}/\text{W}$
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)

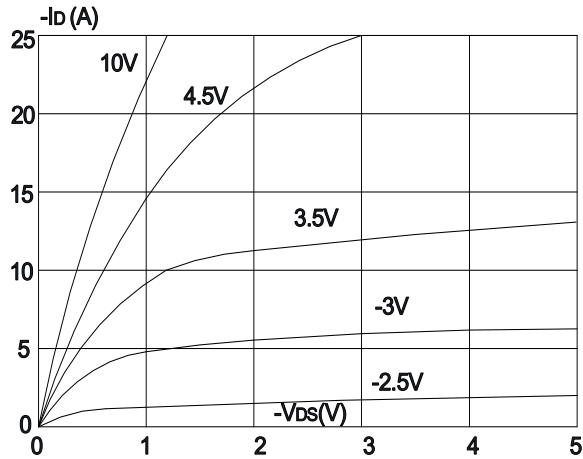
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.5	V
Drain-source on-resistance <sup>(2)</sup>	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4A$	-	55	70	m $\Omega$
		$V_{GS} = -4.5V, I_D = -3A$	-	80	95	
<b>Dynamic characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$	-	580	-	pF
Output Capacitance	$C_{oss}$		-	98	-	
Reverse Transfer Capacitance	$C_{rss}$		-	74	-	
<b>Switching characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15V, I_D = -1A,$ $V_{GS} = -10V, R_G = 2.5\Omega$	-	7	-	ns
Turn-on rise time	$t_r$		-	4	-	
Turn-off delay time	$t_{d(off)}$		-	18	-	
Turn-off fall time	$t_f$		-	13	-	
Total Gate Charge	$Q_g$	$V_{DS} = -15V, I_D = -4.1A,$ $V_{GS} = -10V$	-	11	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.9	-	
Gate-Drain Charge	$Q_{gd}$		-	2	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = -4.1A$	-	-0.8	-1.2	V
Diode Forward current	$I_S$		-	-	-4.1	A

**Notes:**

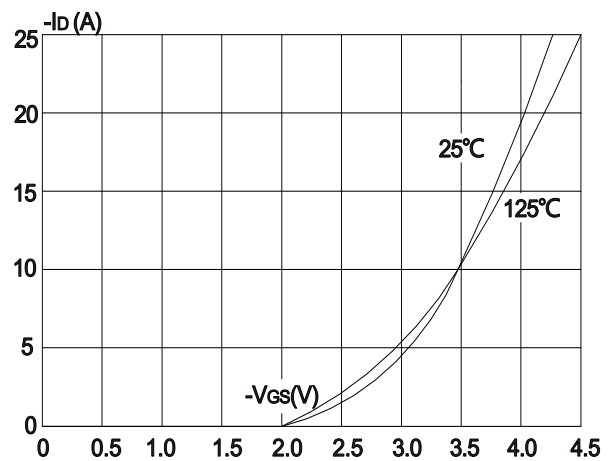
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
3. Surface Mounted on FR4 Board,  $t_s \leq 10$  sec

## Typical Performance Characteristics

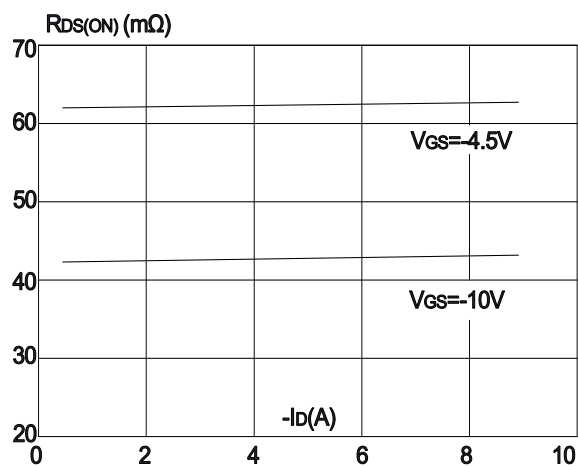
**Figure 1: Output Characteristics**



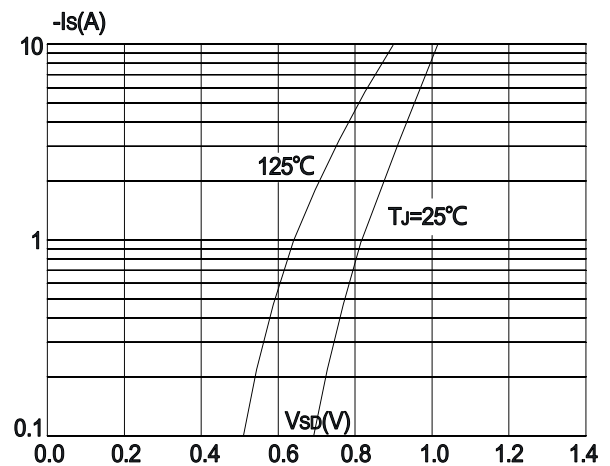
**Figure 2: Typical Transfer Characteristics**



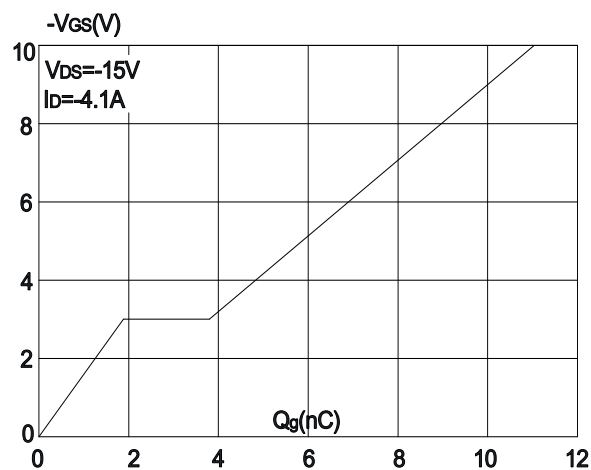
**Figure 3: On-resistance vs. Drain Current**



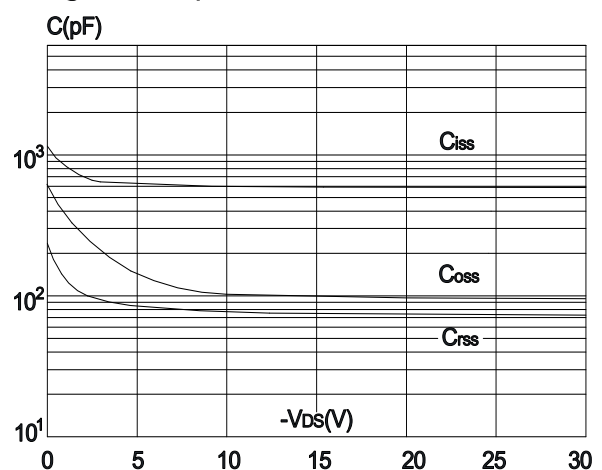
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

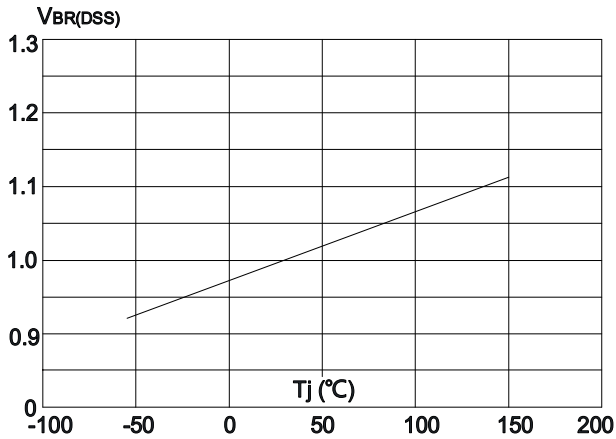


**Figure 6: Capacitance Characteristics**

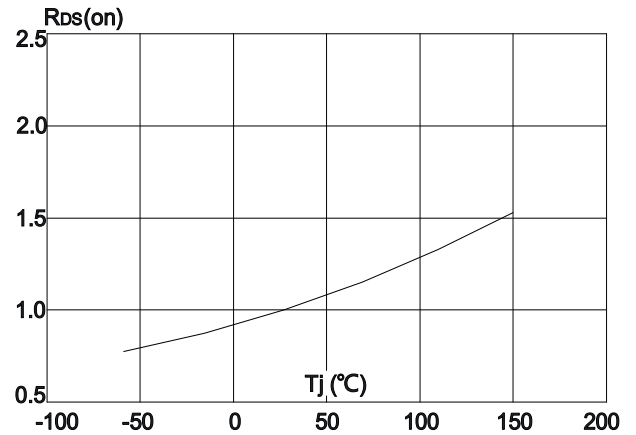


## Typical Performance Characteristics

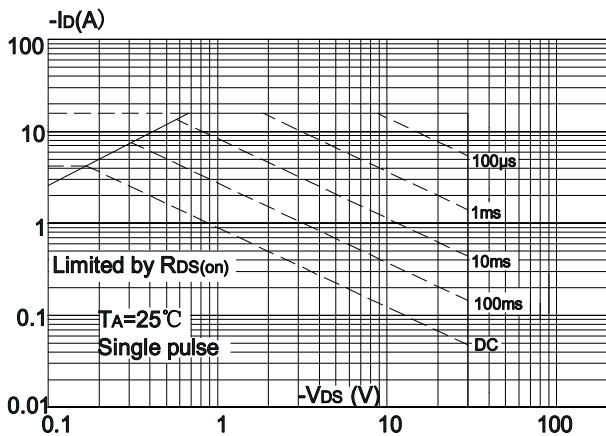
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



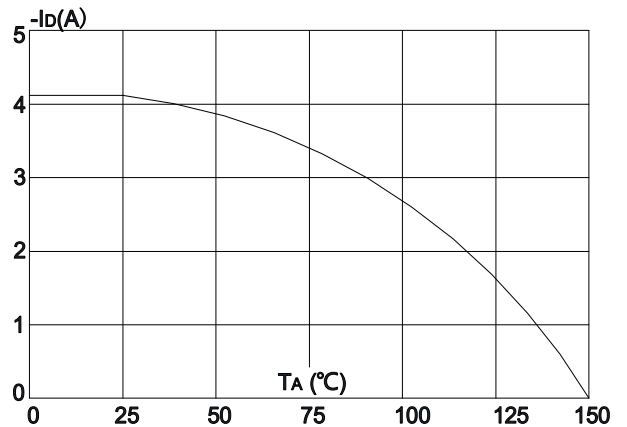
**Figure 8: Normalized on Resistance vs. Junction Temperature**



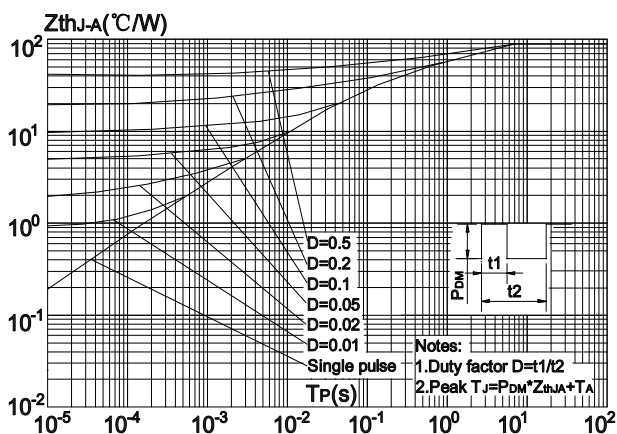
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**

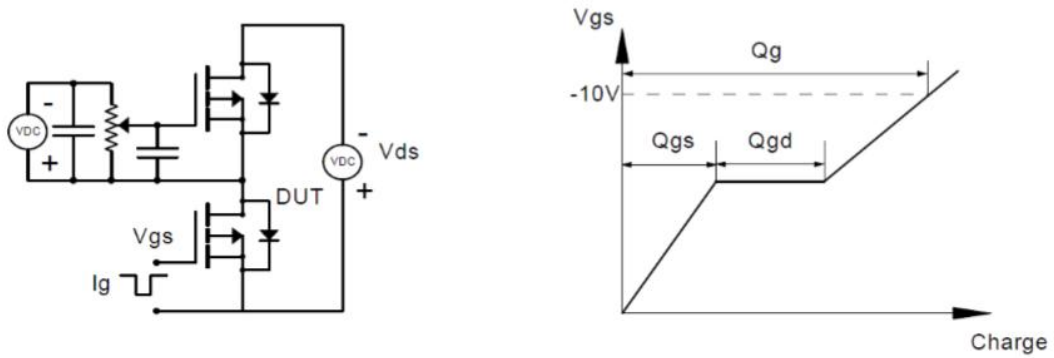


**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**

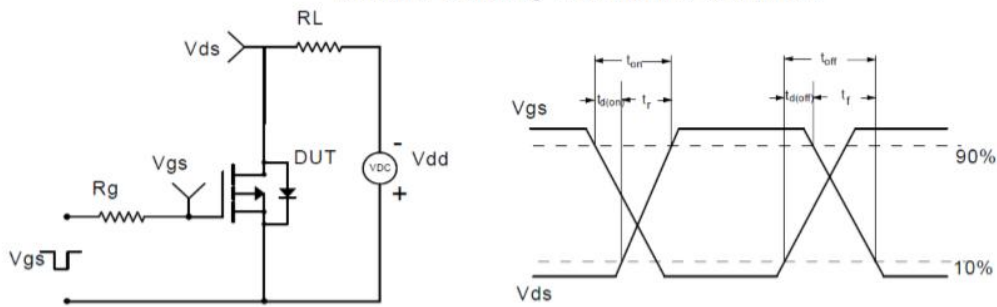


### Typical Performance Characteristics

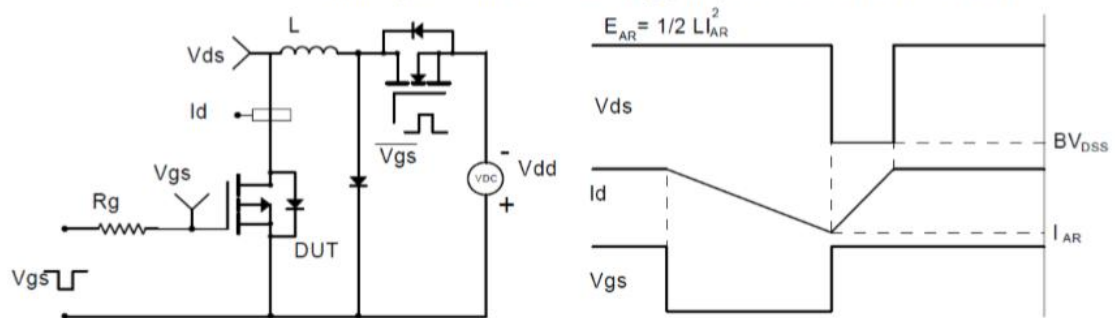
Gate Charge Test Circuit & Waveform



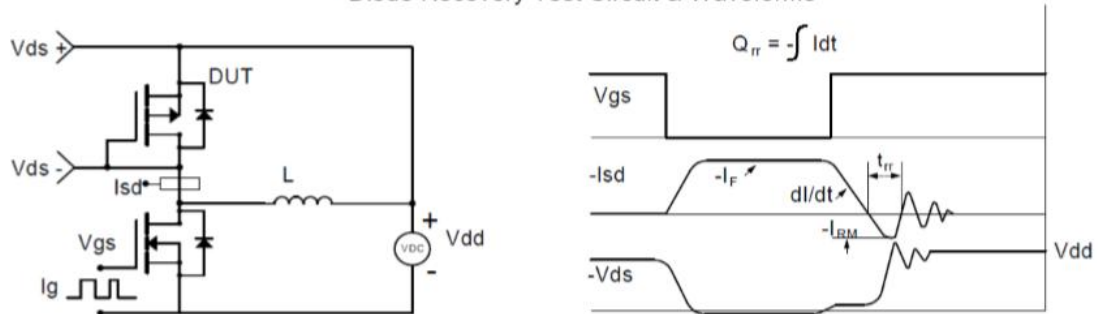
Resistive Switching Test Circuit & Waveforms



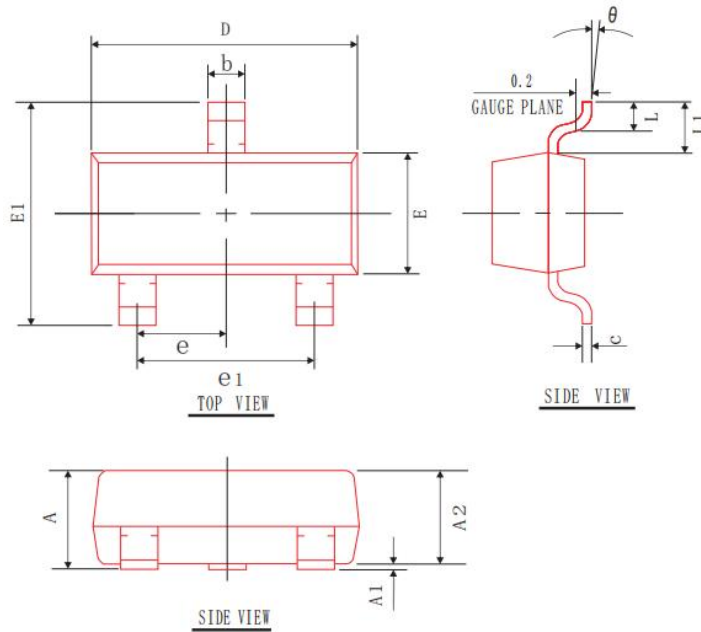
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-SOT-23



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		