★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology
★ 100% EAS Guaranteed

Product Summary

RoHS

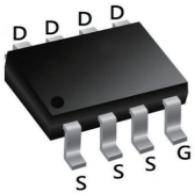
BVDSS	RDSON	ID
-30V	9.5mΩ	-12A

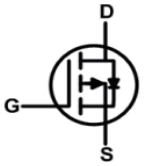
Description

The 4407A is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 4407A meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration





Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	**Drain-Source Voltage**	-30	V
V_{GS}	**Gate-Source** Voltage	±20	V
I_D@T_A=25°C	**Continuous** Drain Current, V_{GS} @ -10V[1]	-12	A
I_D@T_A=70°C	**Continuous** Drain Current, V_{GS} @ -10V[1]	-9	A
I_{DM}	**Pulsed** Drain Current[2]	-46	A
E_{AS}	**Single** Pulse Avalanche Energy[3]	55	mJ
I_{AS}	**Avalanche** Current	-50	A
P_D@T_A=25°C	**Total** Power Dissipation[4]	4.5	W
T_{STG}	**Storage Temperature** Range	-55 to 150	°C
T_J	**Operating** Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	75	°C/W
	Thermal Resistance Junction-Ambient [1](t≦10s)	---	40	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	24	°C/W

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-1	-1.6	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance Note3	V_{GS}= -10V, I_D= -10A	-	9.5	14	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	17	24	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}= -15V, V_{GS}=0V, f=1.0MHz	-	1770	-	pF
C_{oss}	Output Capacitance		-	233	-	
C_{rss}	Reverse Transfer Capacitance		-	206	-	
Q_g	Total Gate Charge	V_{DS}= -15V, I_D= -5A, V_{GS}= -10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	1	-	
Q_{gd}	Gate-Drain(“Miller”) Charge		-	1.8	-	
Switching Characteristics						
$T_{d(on)}$	Turn-on Delay Time	V_{DD}= -15V, I_D= -10A, V_{GS}=-10V, R_{GEN}=2.5Ω	-	9	-	ns
T_r	Turn-on Rise Time		-	13	-	
$T_{d(off)}$	Turn-off Delay Time		-	48	-	
T_f	Turn-off Fall Time		-	20	-	
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-12	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-60	A
V_{SD}	Drain to Source Diode Forward	V_{GS}=0V, I_S= -15A	-	-0.8	-1.2	V
T_{rr}	Reverse Recovery Time	T_J=25°C,V_{DD}= -24V, I_F=-2.8A,dI/dt=-100A/μs	-	64	-	ns
Q_{rr}	Reverse Recovery Charge		-	25	-	nC

Notes:

1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2.EAS condition: TJ=25°C, VGS=10V, RG=25Ω, L=0.5mH, IAS=-12.7A

3.Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure1: Output Characteristics

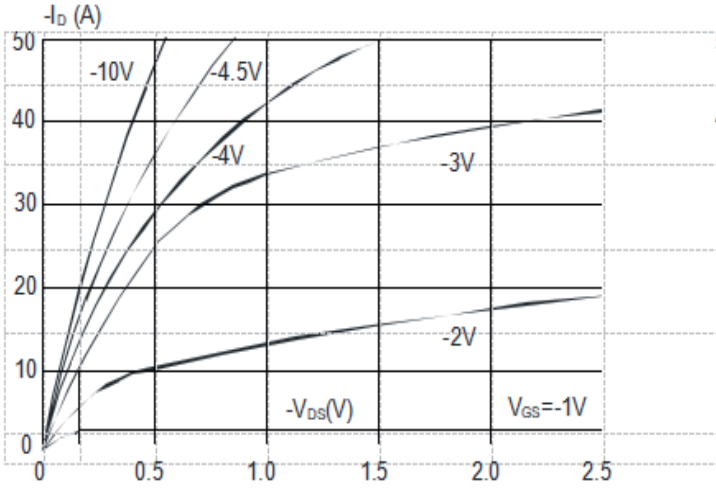


Figure 2: Typical Transfer Characteristics

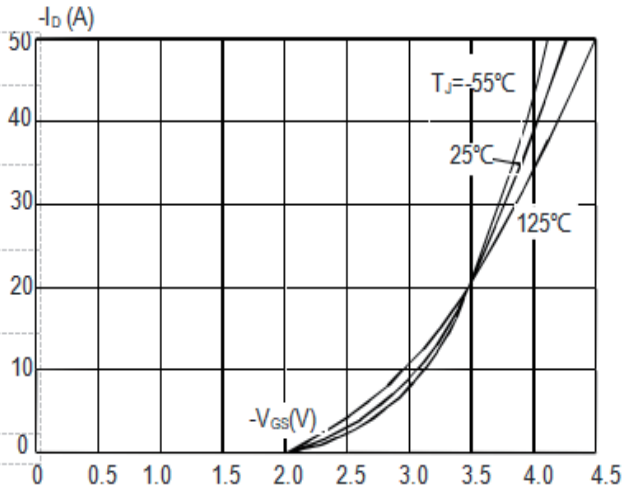


Figure 3:On-resistance vs. Drain Current

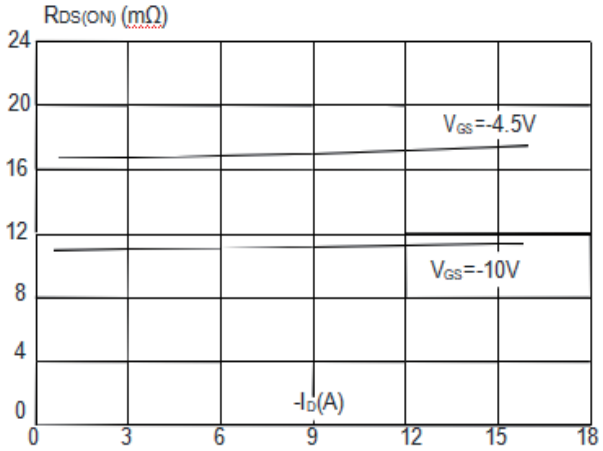


Figure 4: Body Diode Characteristics

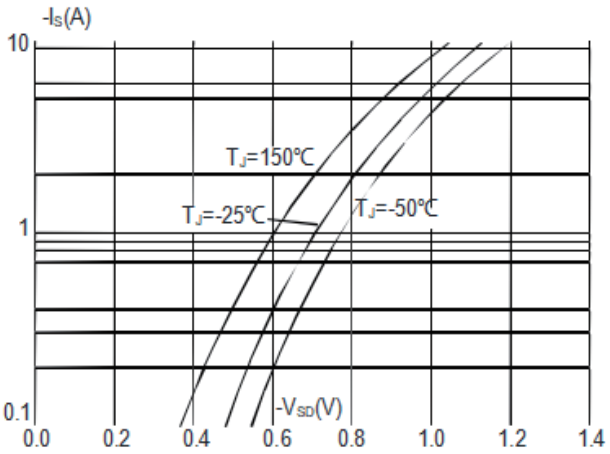


Figure 5: Gate Charge Characteristics

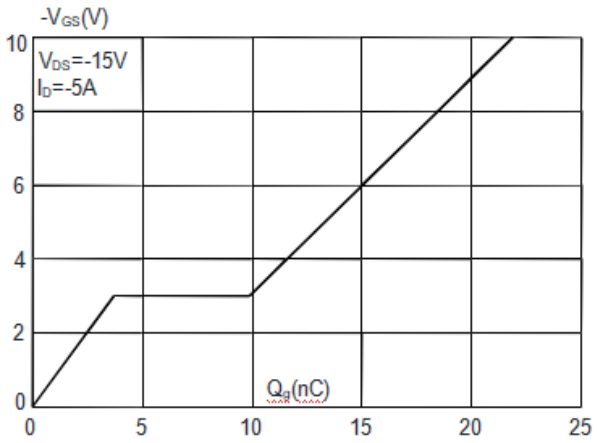
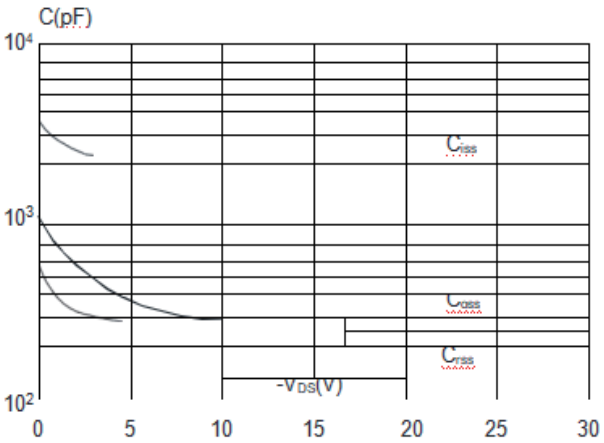


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage

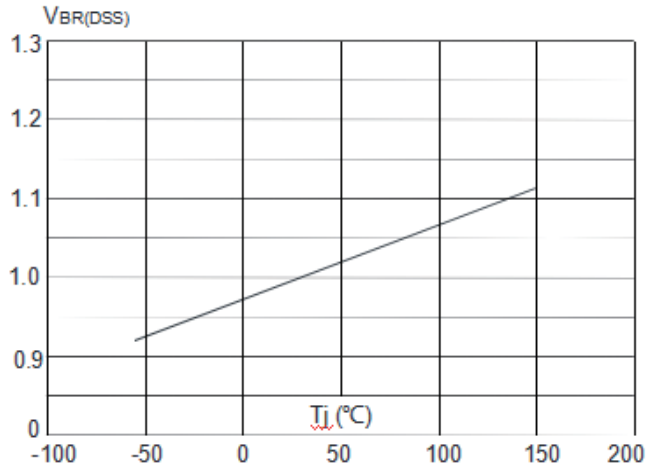


Figure 8: Normalized on Resistance vs. Ju

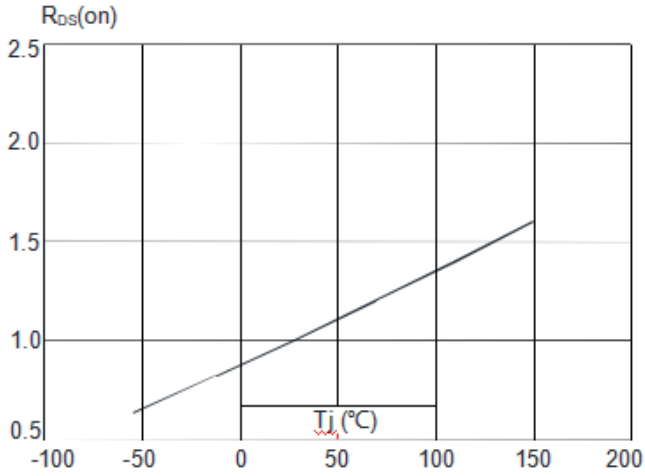
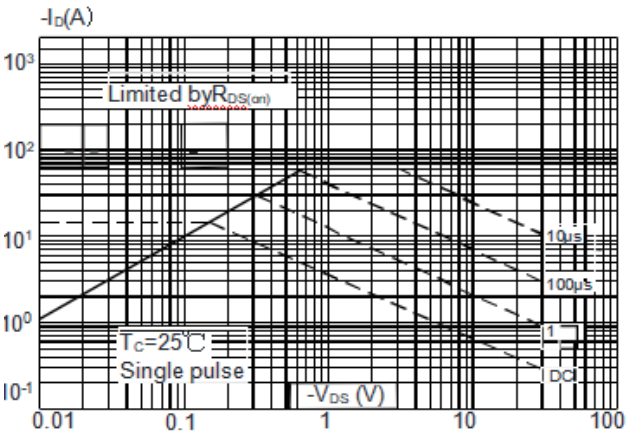


Figure 9: Maximum Safe Operating Area



FFigure 10: Maximum Continuous Drain C

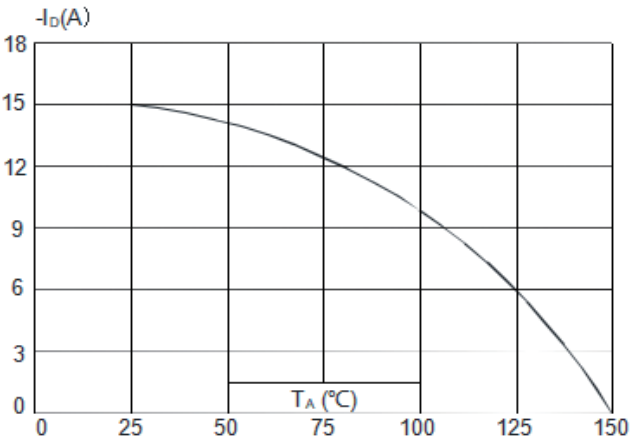
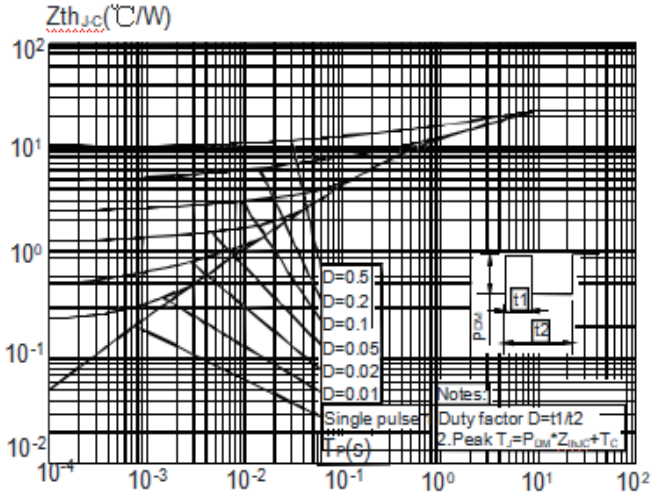
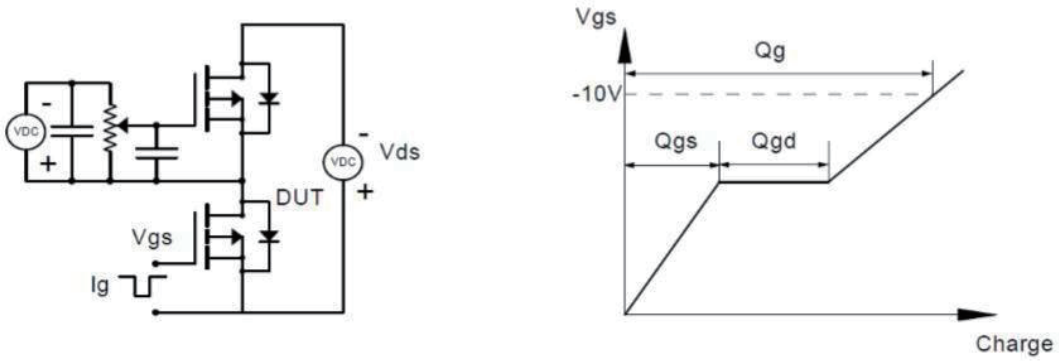


Figure.11: Maximum Effective Transient T

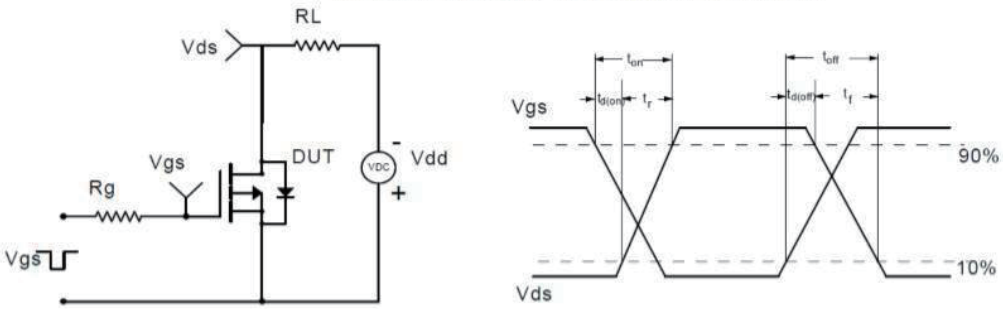


Test Circuit

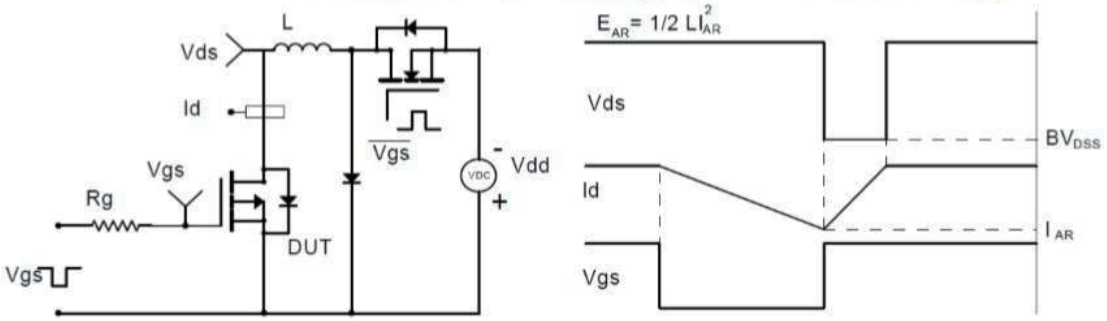
Gate Charge Test Circuit & Waveform



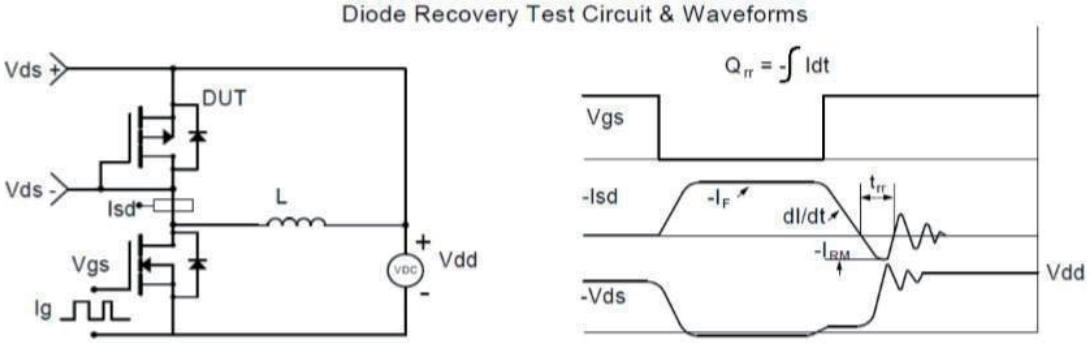
Resistive Switching Test Circuit & Waveforms



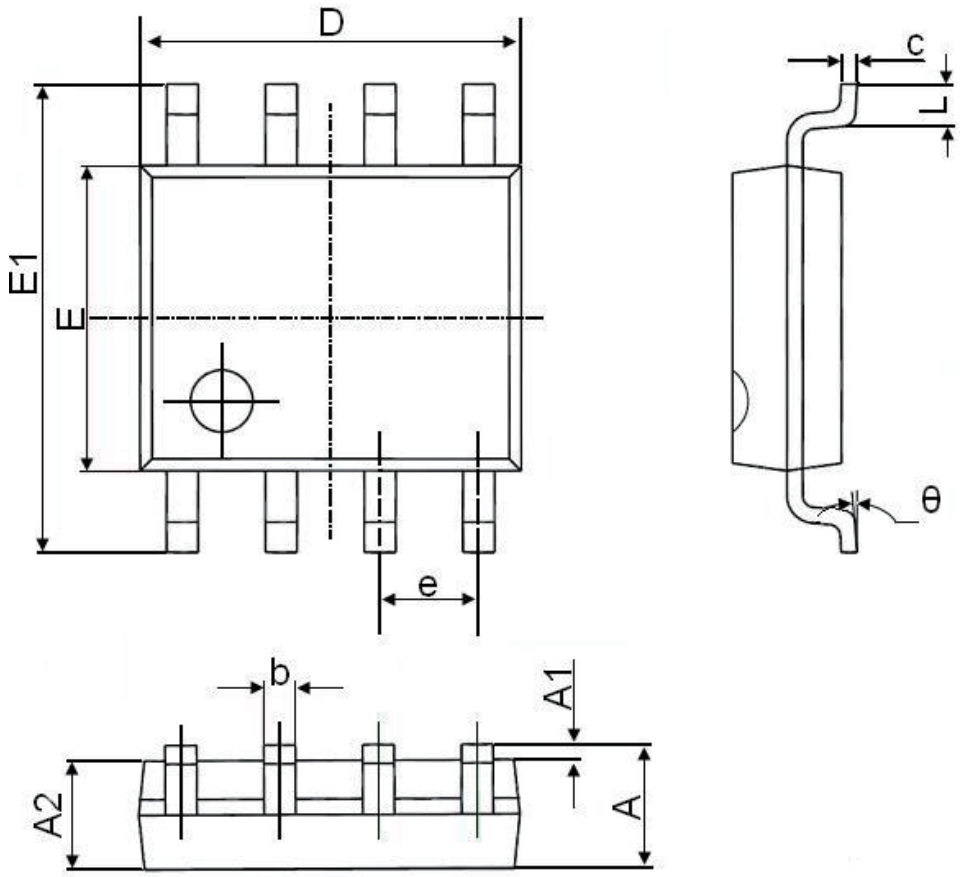
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.1	0.25	0.004	0.01
A2	1.35	1.55	0.053	0.061
b	0.33	0.51	0.013	0.02
c	0.17	0.25	0.006	0.01
D	4.7	5.1	0.185	0.2
E	3.8	4	0.15	0.157
E1	5.8	6.2	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.4	1.27	0.016	0.05
θ	0°	8°	0°	8°

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