

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

Product Summary

RoHS

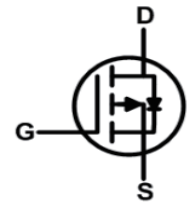
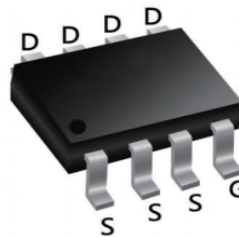
BVDSS	RDS(ON)	ID
-30V	15mΩ	-10A

Description

The 4435B is the high cell density trenched P-ch MOSFETs, which provide excellent RDS(ON) and gate charge for most of the synchronous buck converter applications.

The 4435B meet the RoHS and Green Product requirement .

SOP8 Pin Configuration



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

Symbol	Parameter	Max.	Units	
V _{DSS}	Drain-Source Voltage	-30	V	
V _{GSS}	Gate-Source Voltage	±20	V	
I _D	Continuous Drain Current	T _A = 25°C	-10	A
		T _A = 100°C	-7	A
I _{DM}	Pulsed Drain Current ^{note1}	-36	A	
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	25	mJ	
P _D	Power Dissipation	T _A = 25°C	3.5	W
R _{θJA}	Thermal Resistance, Junction to Ambient	48	°C/W	
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C	

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS} = \pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>Note3</small>	$V_{GS} = -10V, I_D = -9A$	-	15	20	m Ω
		$V_{GS} = -4.5V, I_D = -5A$	-	20	30	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$	-	900	-	pF
C_{oss}	Output Capacitance		-	125	-	pF
C_{rss}	Reverse Transfer Capacitance		-	109	-	pF
Q_g	Total Gate Charge	$V_{DS} = -15V, I_D = -8A,$ $V_{GS} = -10V$	-	42	-	nC
Q_{gs}	Gate-Source Charge		-	8.8	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	7.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -15V, I_D = -1A,$ $V_{GS} = -10V, R_{GEN} = 6\Omega$	-	13	-	ns
t_r	Turn-on Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	198	-	ns
t_f	Turn-off Fall Time		-	98	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-10	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-36	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -9A$	-	-0.8	-1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}, V_{DD} = -15V, V_G = -10V, R_G = 25\Omega, L = 0.5\text{mH}, I_{AS} = -10A$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

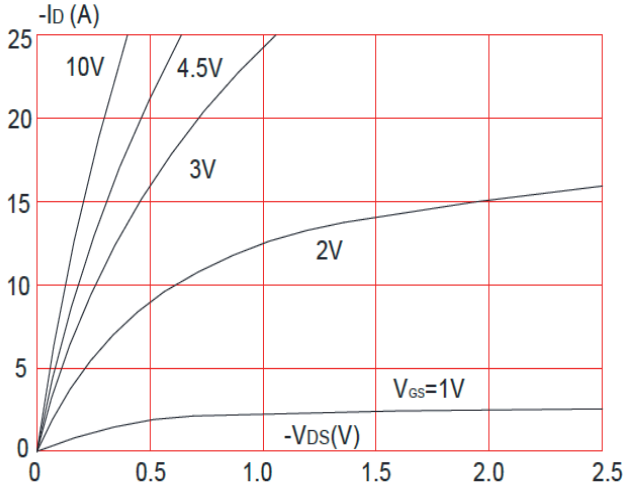


Figure 2: Transfer Characteristics

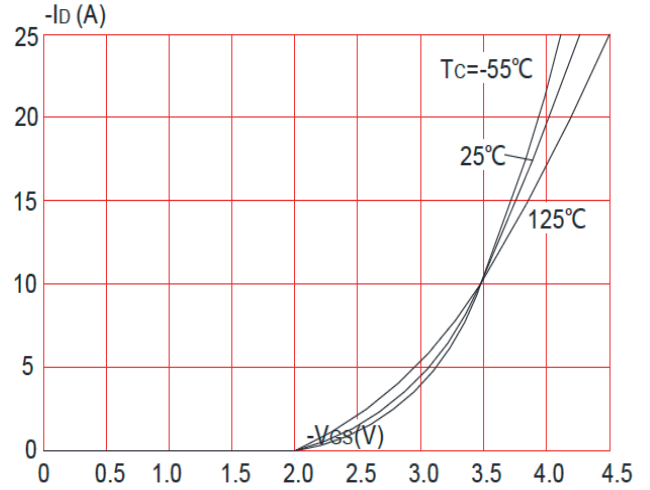


Figure 3: On-resistance vs. Drain Current

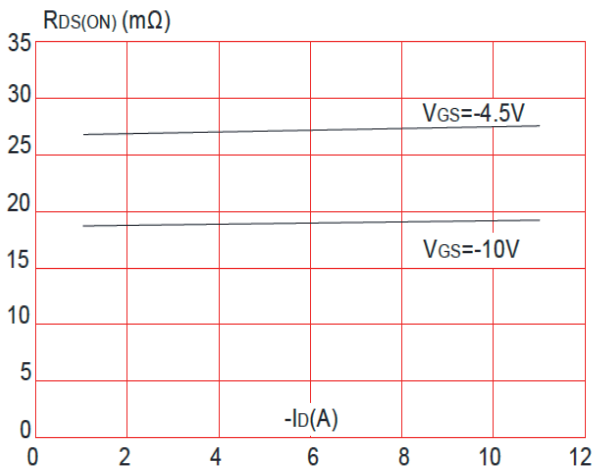


Figure 4: Body Diode Characteristics

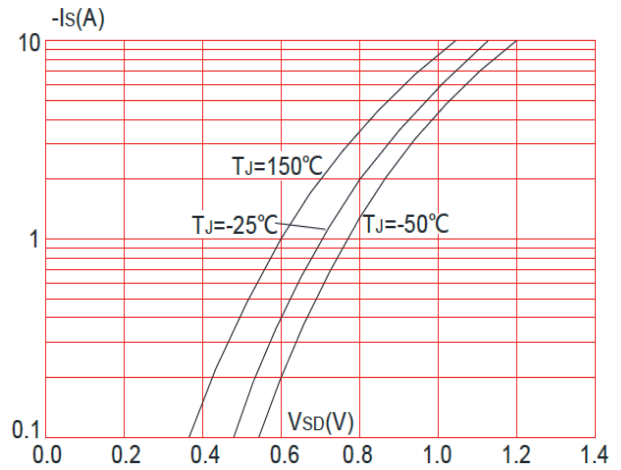


Figure 5: Gate Charge Characteristics

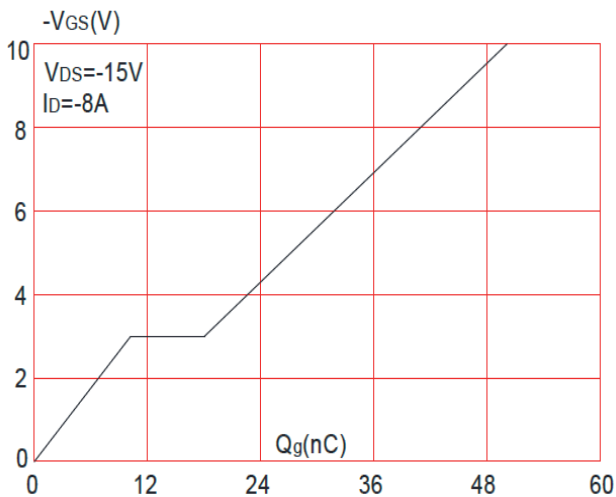
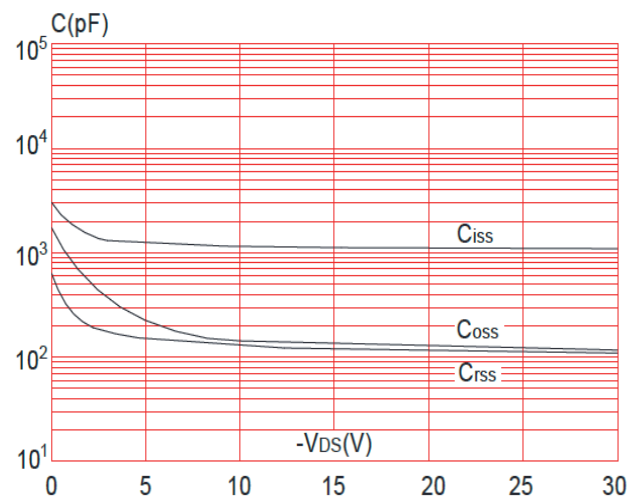


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

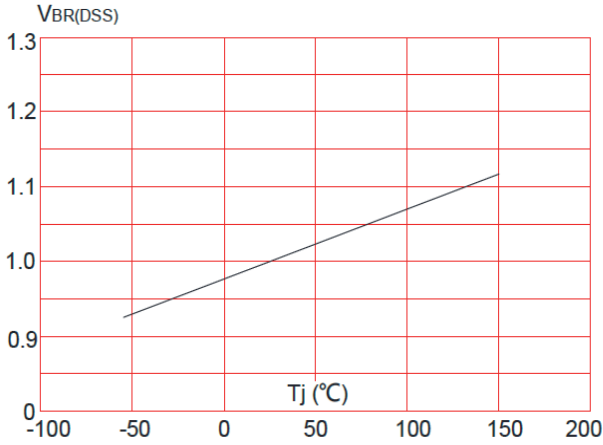


Figure 8: Normalized on Resistance vs. Junction Temperature

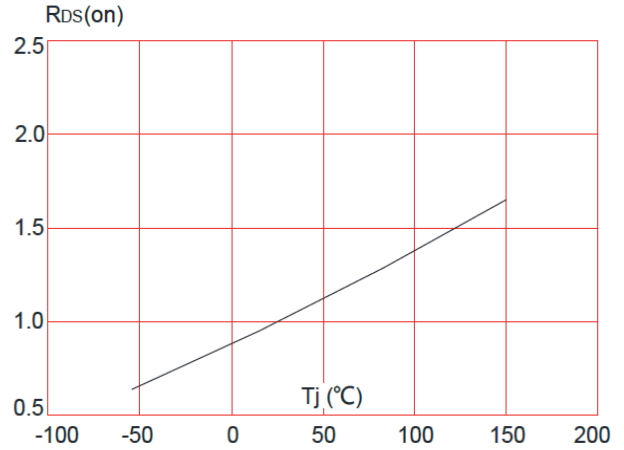


Figure 7: Maximum Safe Operating Area

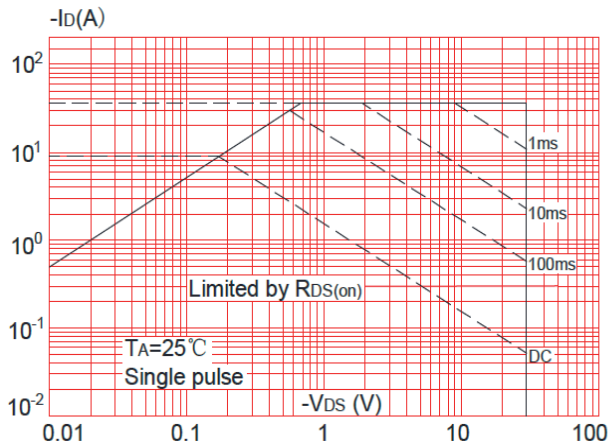


Figure 8: Maximum Continuous Drain Current vs. Ambient Temperature

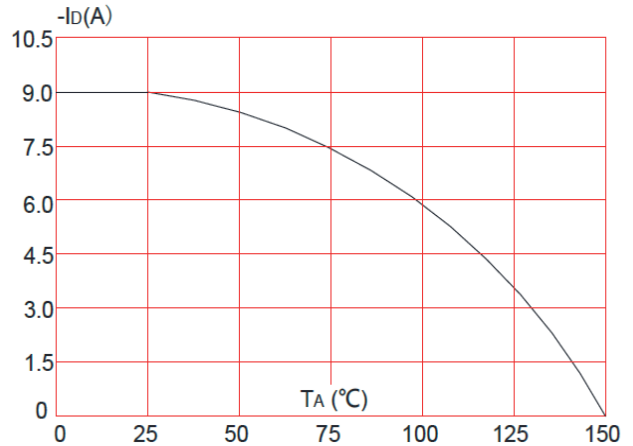
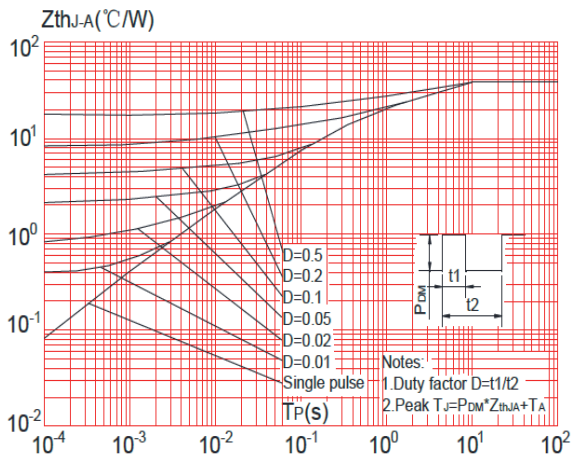


Figure 7: Maximum Effective Transient Thermal Impedance Junction to Ambient



Test Circuit

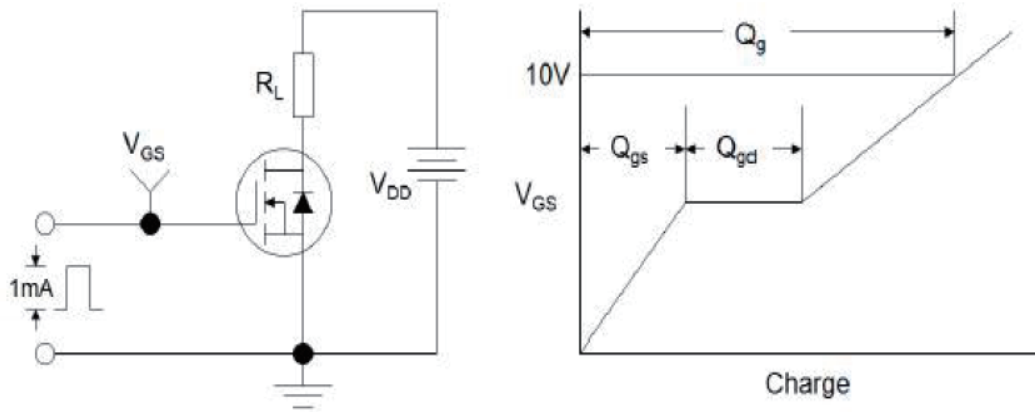


Figure1:Gate Charge Test Circuit & Waveform

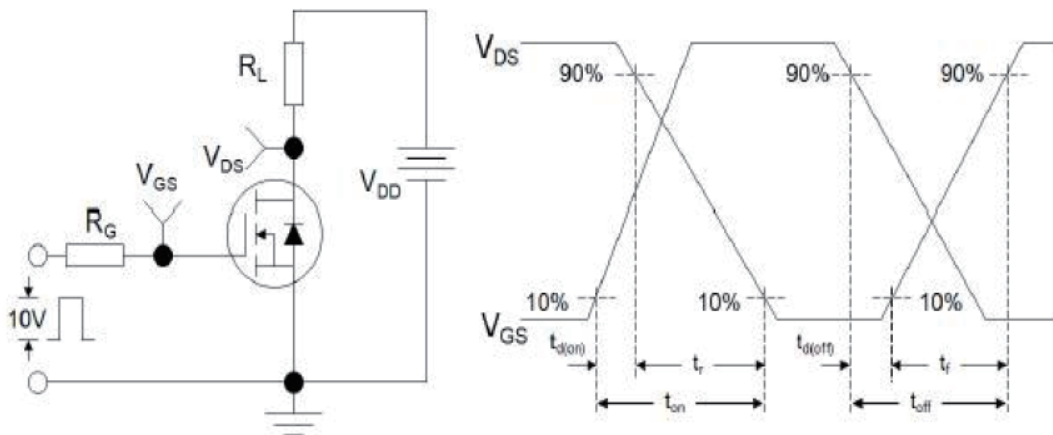


Figure 2: Resistive Switching Test Circuit & Waveforms

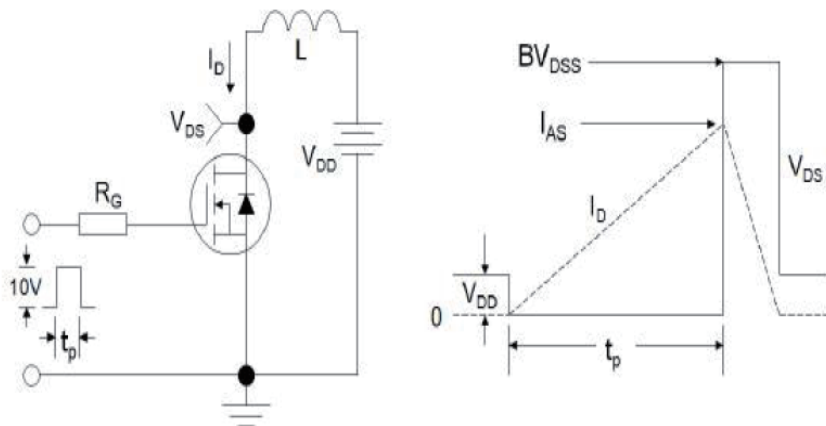
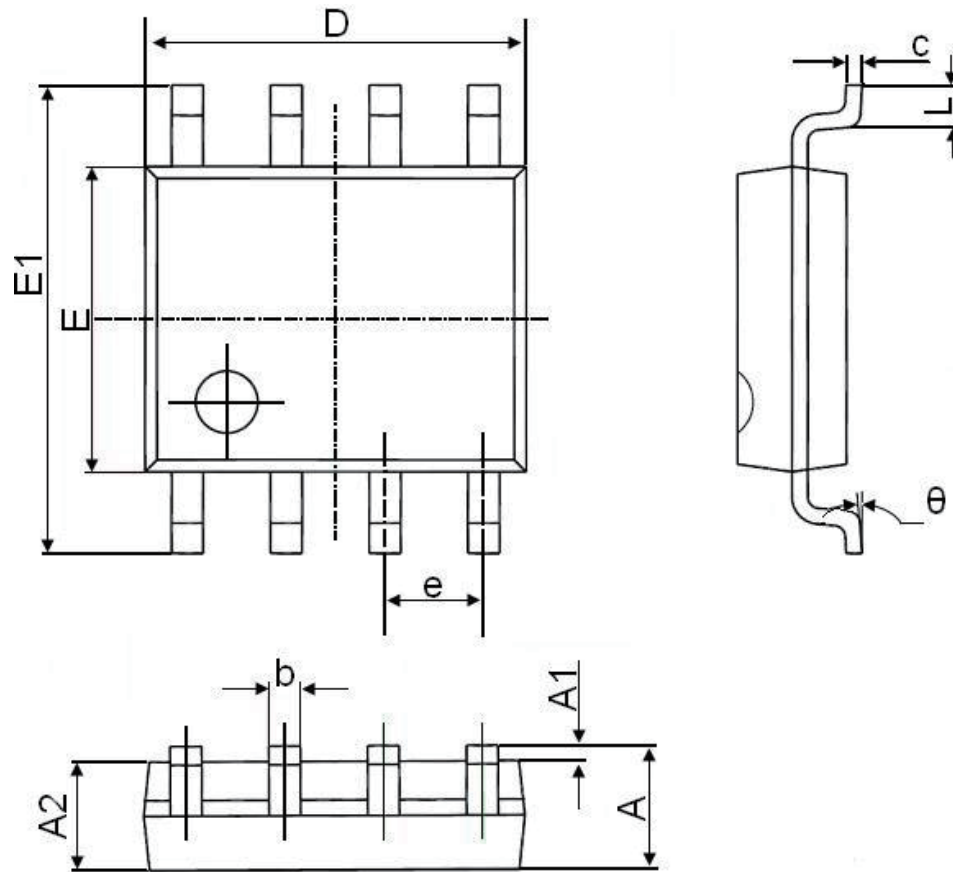


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

SOP-8 Package Information



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°