

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

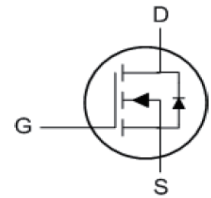
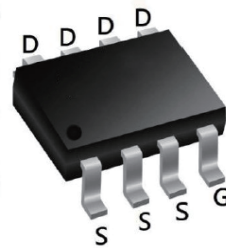
Product Summary

BVDSS	R _{DS(on)}	I _D
30V	4.5mΩ	25A

Description

The 4430 is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The 4430 meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _{D@TA=25°C}	Continuous Drain Current, V _{GS} @ 10V ¹	25	A
I _{D@TA=70°C}	Continuous Drain Current, V _{GS} @ 10V ¹	15	A
I _{DM}	Pulsed Drain Current ²	80	A
EAS	Single Pulse Avalanche Energy ³	105.8	mJ
I _{AS}	Avalanche Current	51	A
P _{D@TA=25°C}	Total Power Dissipation ⁴	10	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 _{θJA}	Thermal Resistance Junction-Ambient ¹	---	85	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	35	°C/W

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 note ³	$V_{GS}=10V, I_D=20A$	-	4.6	6	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	6.1	8.6	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	1700	-	pF
C_{oss}	Output Capacitance		-	320	-	pF
C_{rss}	Reverse Transfer Capacitance		-	300	-	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=10A, V_{GS}=10V$	-	45	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	15	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V, I_D=20A, V_{GS}=10V, R_{REN}=3\Omega$	-	21	-	ns
t_r	Turn-on Rise Time		-	32	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	59	-	ns
t_f	Turn-off Fall Time		-	34	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$	-	15	-	ns
Q_{rr}	Body Diode Reverse Recovery Time Charge		-	4	-	nC

Note :

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^\circ\text{C}, V_{GS}=15V, R_G=25\Omega, L=0.5mH, I_{AS}=20A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

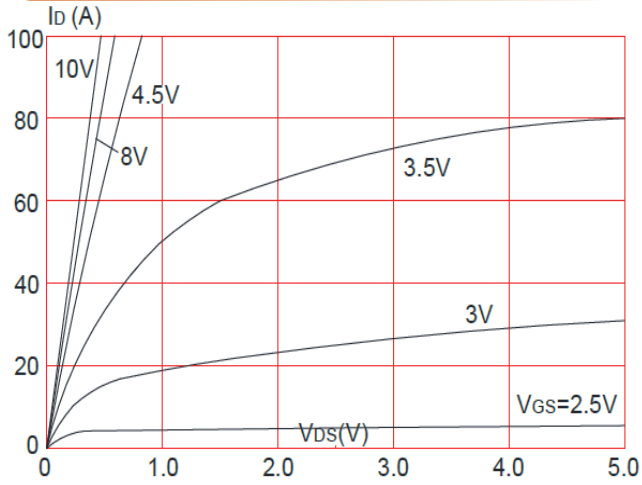


Figure 2: Typical Transfer Characteristics

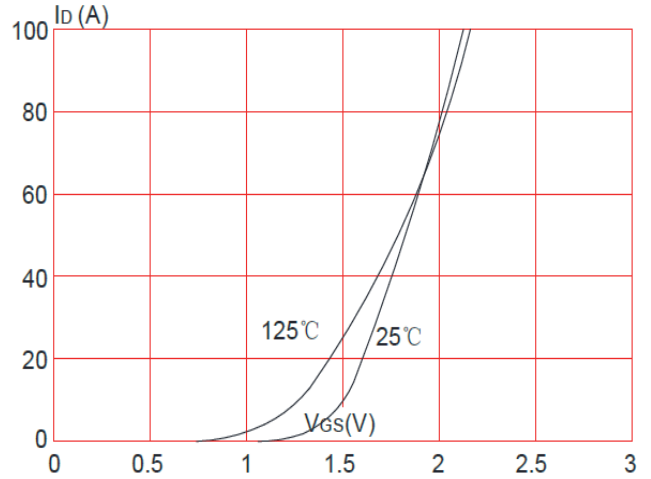


Figure 3: On-resistance vs. Drain Current

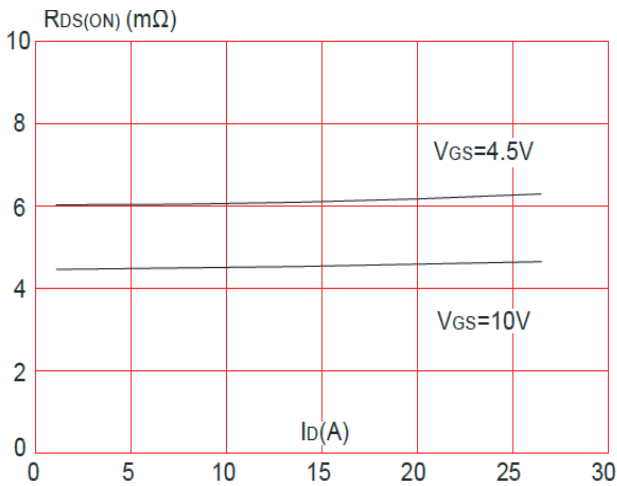


Figure 4: Body Diode Characteristics

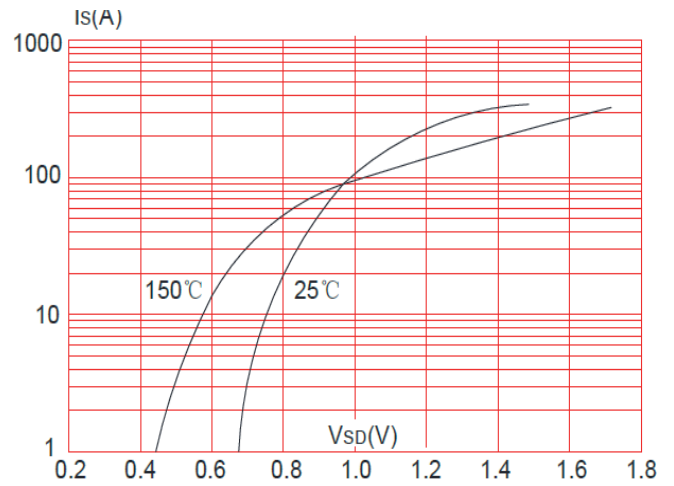


Figure 5: Gate Charge Characteristics

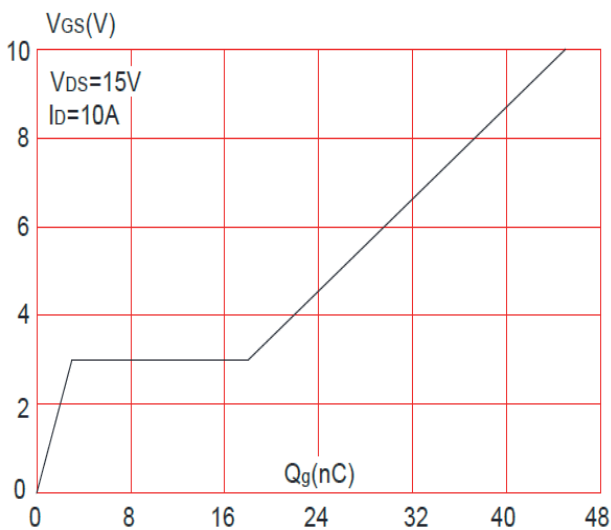
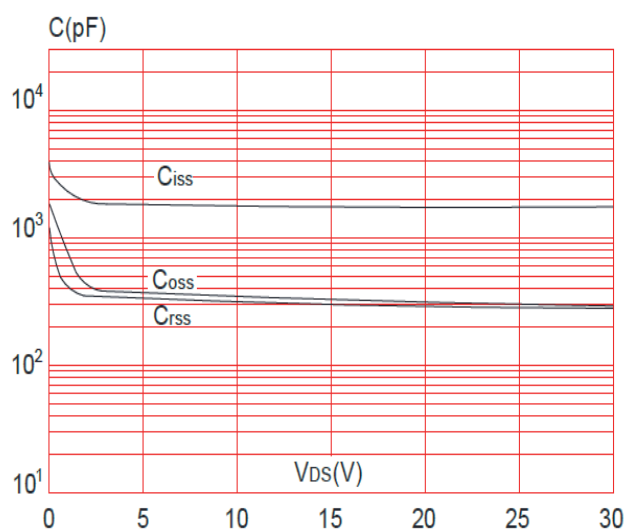


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage

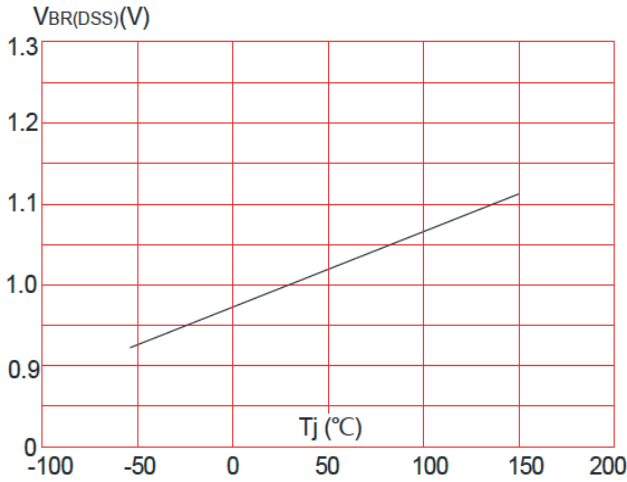


Figure 8: Normalized on Resistance vs. Junction Temperature

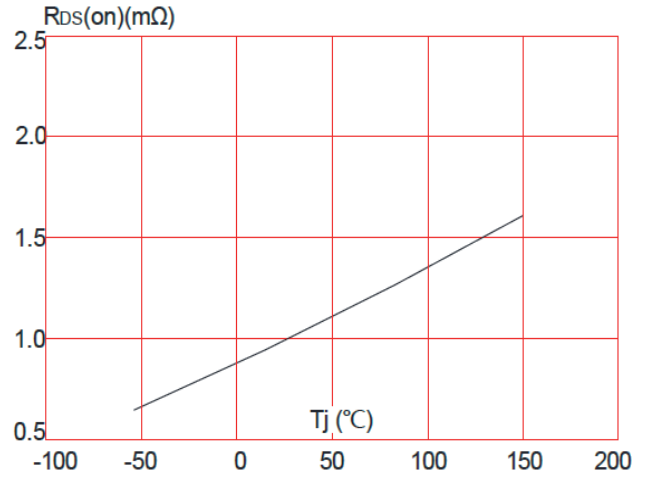


Figure 9: Maximum Safe Operating Area

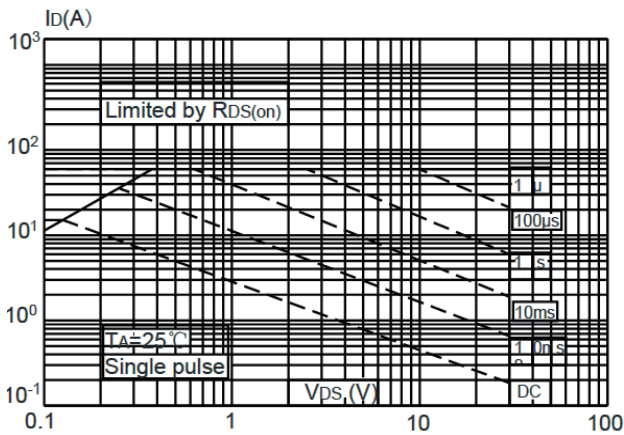


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

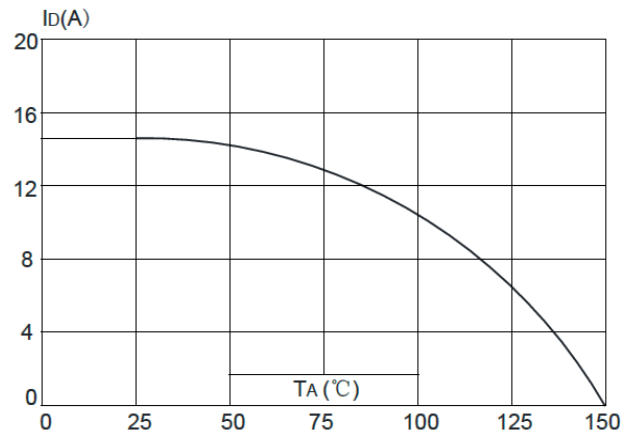
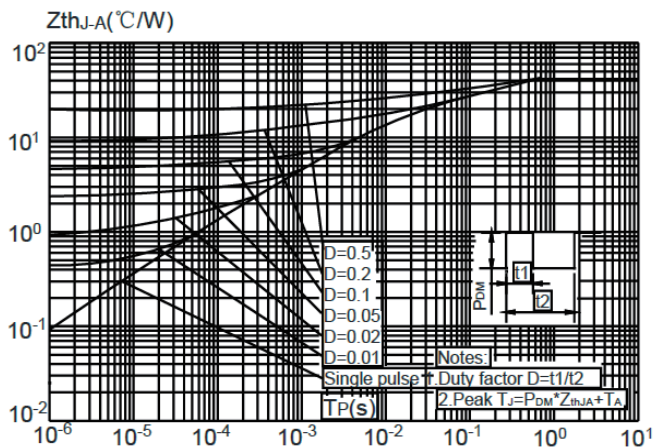
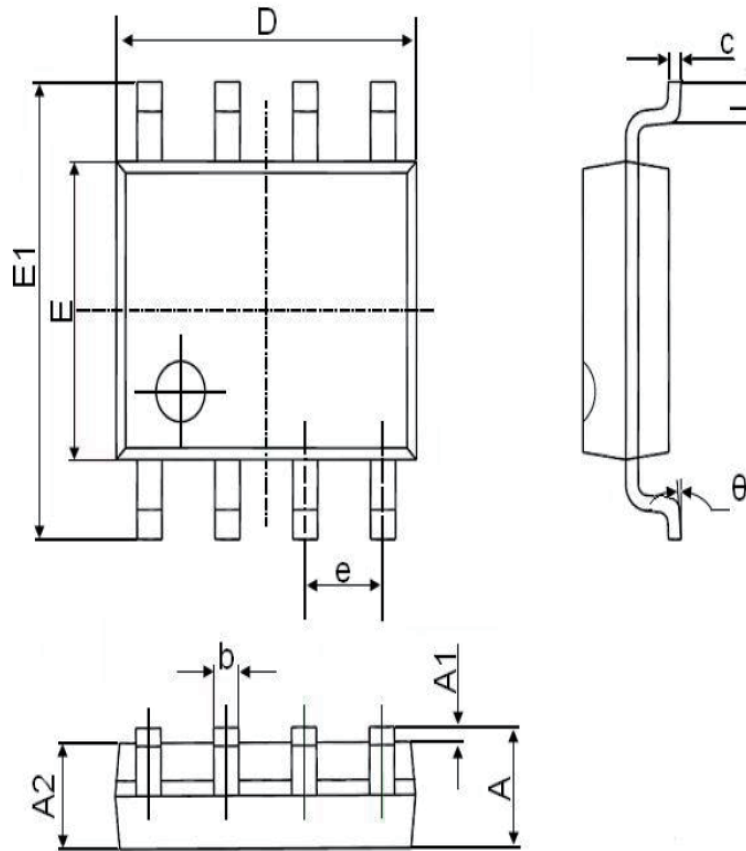


Figure 11: Maximum Effective Transient Thermal Impedance



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°

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