

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

Product Summary

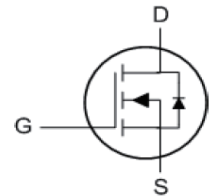
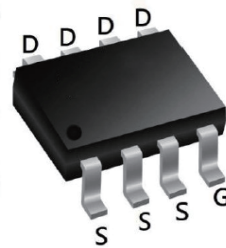
BVDSS	RDS(ON)	ID
30V	7mΩ	18A

Description

The 4410 is the high cell density trenched N-ch MOSFETs, which provide excellent RDS(ON) and gate charge for most of the synchronous buck converter applications.

The 4410 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
$I_{D@T_A=25^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	18	A
$I_{D@T_A=70^{\circ}C}$	Continuous Drain Current, V_{GS} @ 10V ¹	10	A
I_{DM}	Pulsed Drain Current ²	60	A
EAS	Single Pulse Avalanche Energy ³	40	mJ
I_{AS}	Avalanche Current	35	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation 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	---	41	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	10	°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 _b =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 _b =250μA	1	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note ³	V _{GS} =10V, I _b =15A	-	7	9	mΩ
		V _{GS} =4.5V, I _b =10A	-	11	14	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	1116	-	pF
C _{oss}	Output Capacitance		-	187	-	pF
C _{rss}	Reverse Transfer Capacitance		-	152	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _b =8A, V _{GS} =10V	-	13.3	-	nC
Q _{gs}	Gate-Source Charge		-	3.1	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V, I _b =15A, V _{GS} =10V, R _{REN} =3Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	19	-	ns
t _{d(off)}	Turn-off Delay Time		-	35	-	ns
t _f	Turn-off Fall Time		-	21	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	15	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	60	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =15A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =5A, dI/dt=100A/μs	-	14	-	ns
Q _{rr}	Body Diode Reverse Recovery Time Charge		-	4.1	-	nC

Note :

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{GS}=15V, R_G=25Ω, L=0.5mH, I_{AS}=12.6A
3. Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤0.5%

Typical Performance Characteristics

Figure 1: Output Characteristics

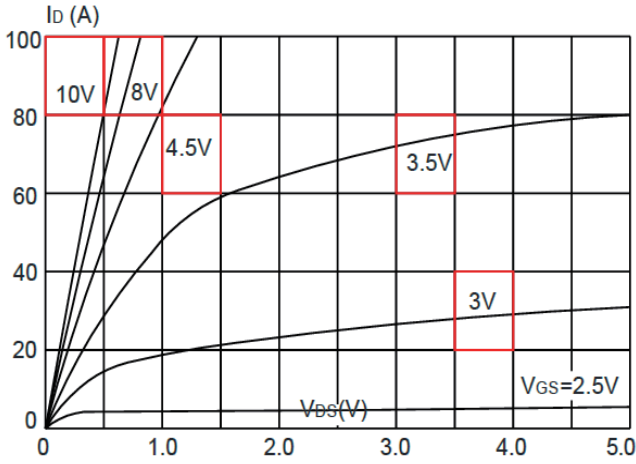


Figure 2: Typical Transfer Characteristics

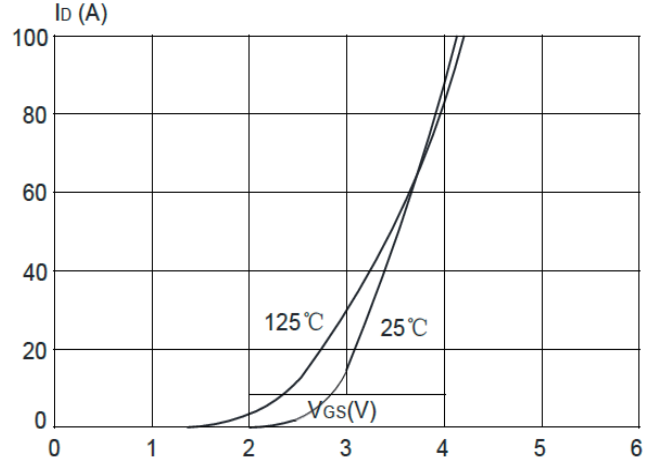


Figure 3: On-resistance vs. Drain Current

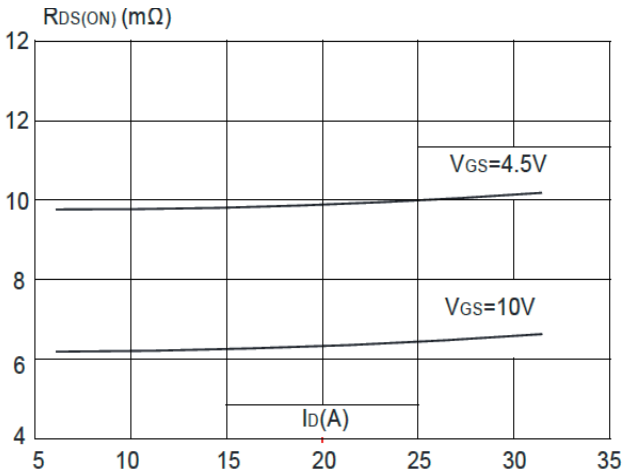


Figure 4: Body Diode Characteristics

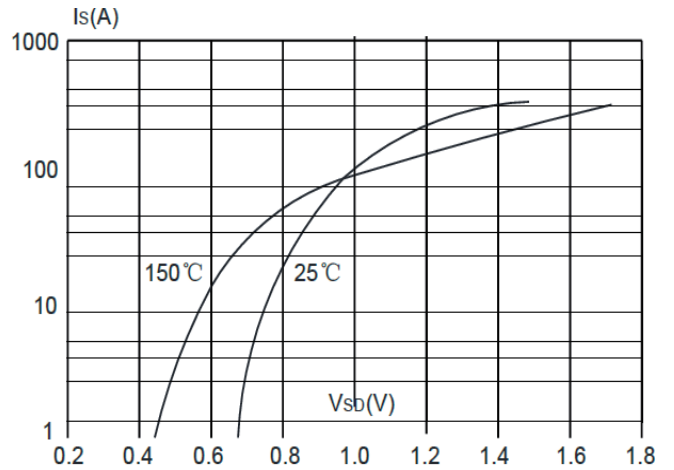


Figure 5: Gate Charge Characteristics

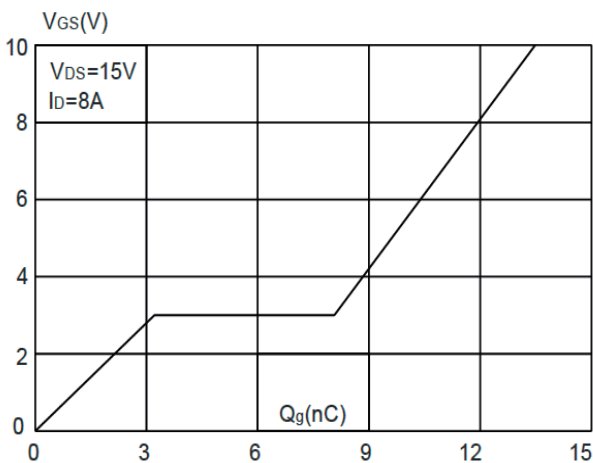
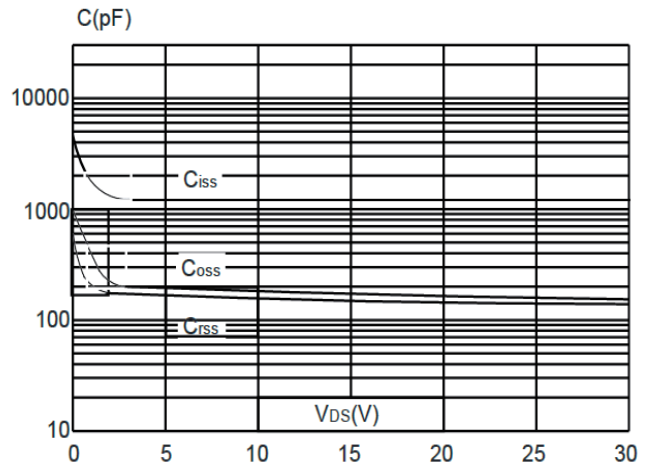


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage

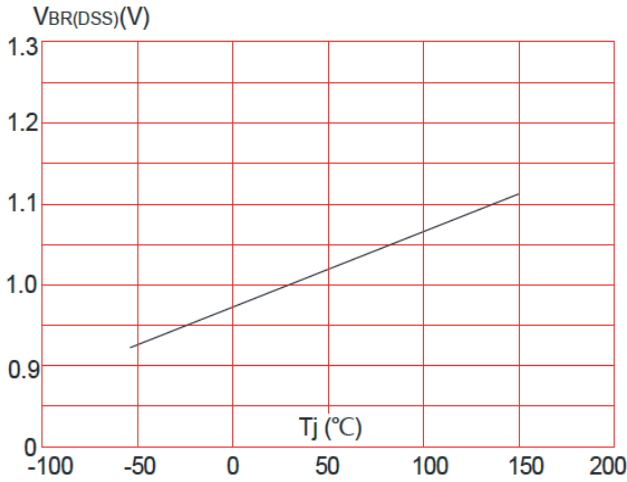


Figure 8: Normalized on Resistance vs. Junction Temperature

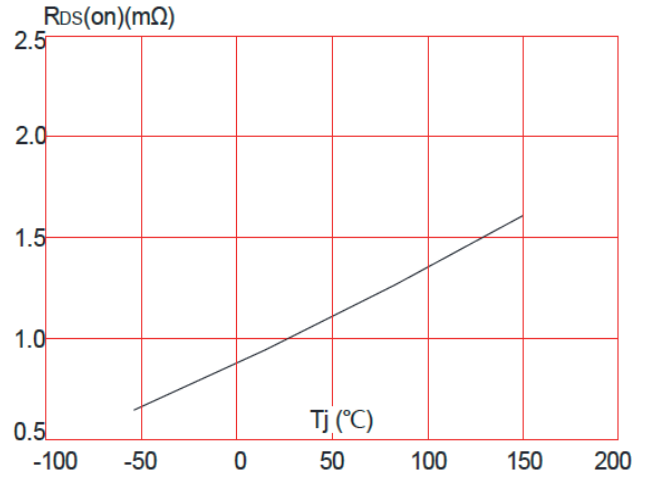


Figure 9: Maximum Safe Operating Area

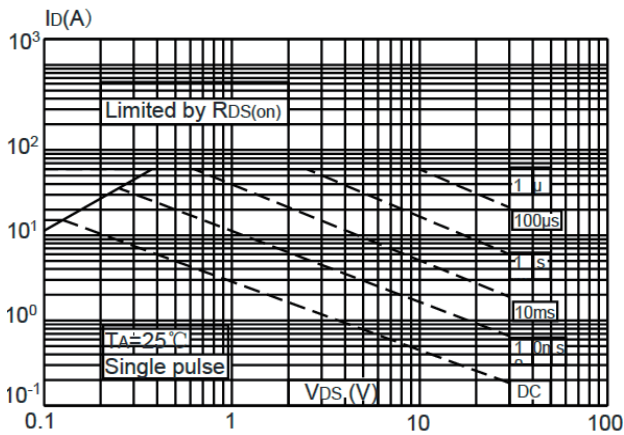


Figure 10: Maximum Continuous Drain Current

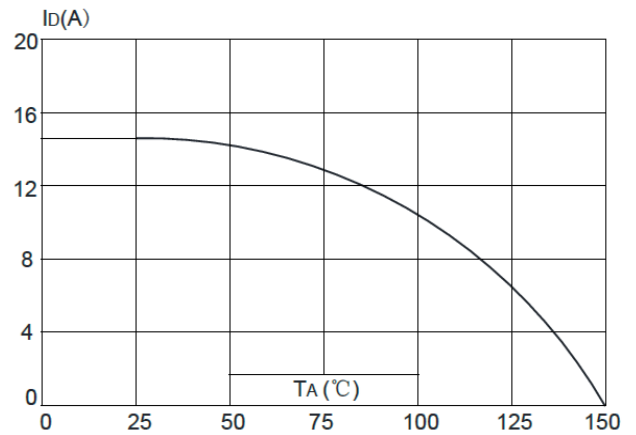
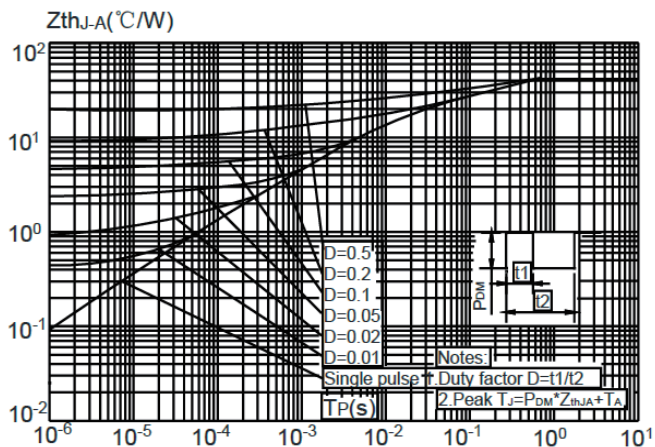
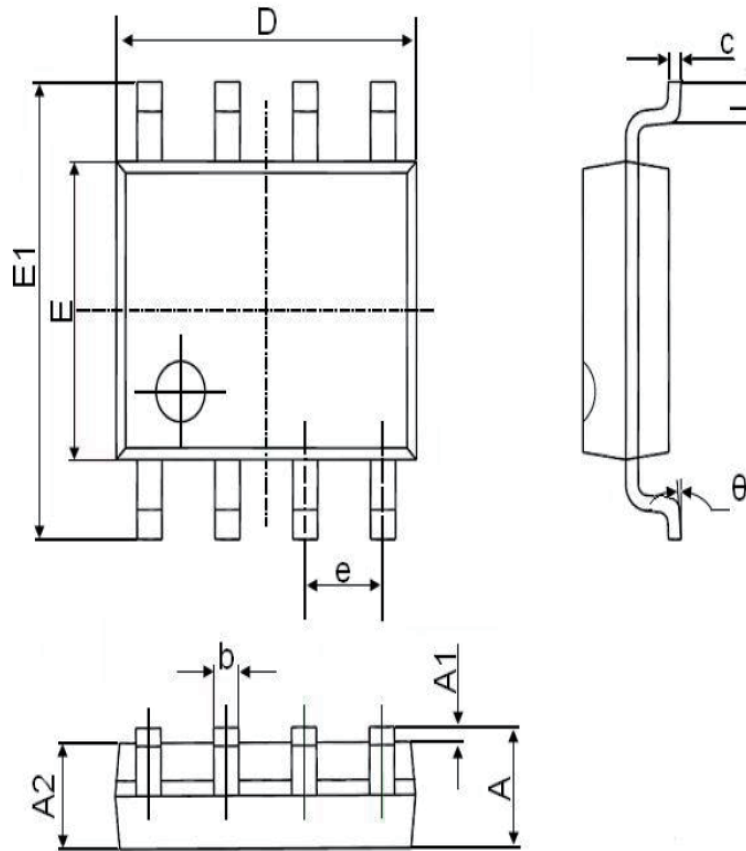


Figure 11: Maximum Effective Transient Thermal Impedance



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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