



ER4410

30V N-Channel MOSFET

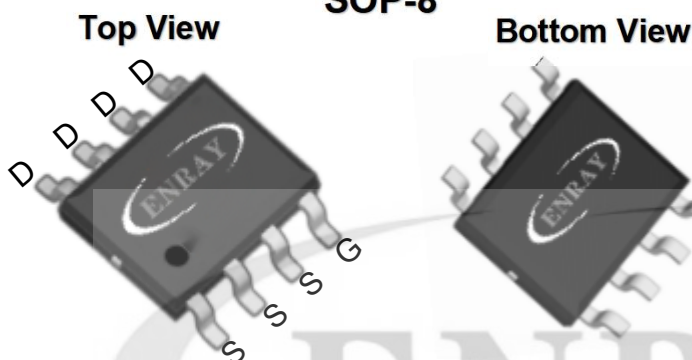
Features

The E R 4410 is the high cell density trench N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The DS4410 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

V _{DS}	30V
I _D	18A
R _{DS(ON)} (at V _{GS} =10V)	<9mΩ
R _{DS(ON)} (at V _{GS} =4.5V)	< 14mΩ

SOP-8



Maximum Ratings(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current, V _{GS} @10V ¹	I _D @TA=25°C	18	A
Continuous Drain Current, V _{GS} @ 10V	I _D @TA=70°C	10	
Pulsed Drain Current ²	I _{DM}	60	
Single Pulse Avalanche Energy	E _{AS}	40	mJ
Avalanche Current	I _{AS}	35	A
Total Power Dissipation	P _D @TA=25°C	5	W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	

Thermal Data

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-ambient	R _{θJA}	41	°C/W
Thermal Resistance Junction-Case	R _{θJC}	10	

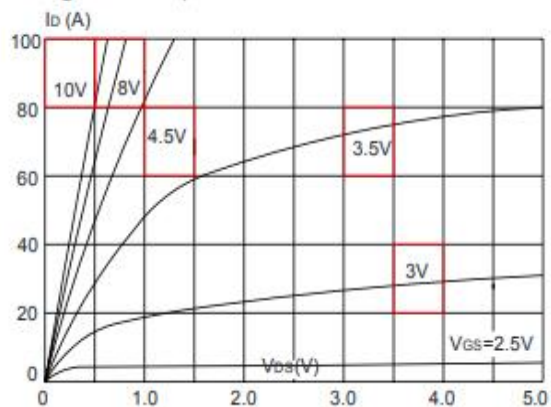
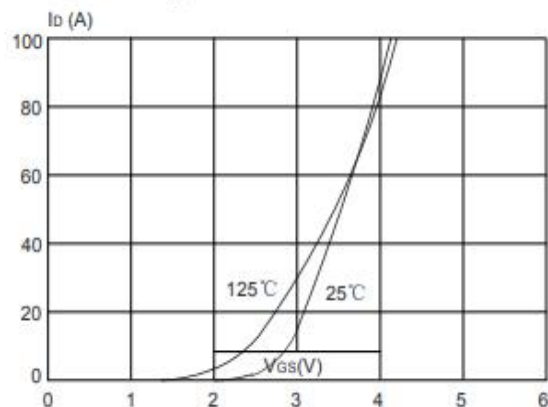
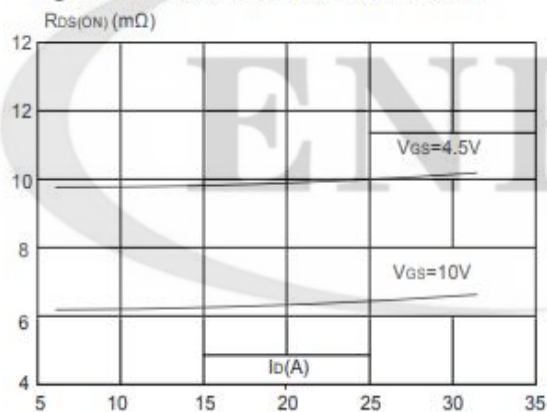
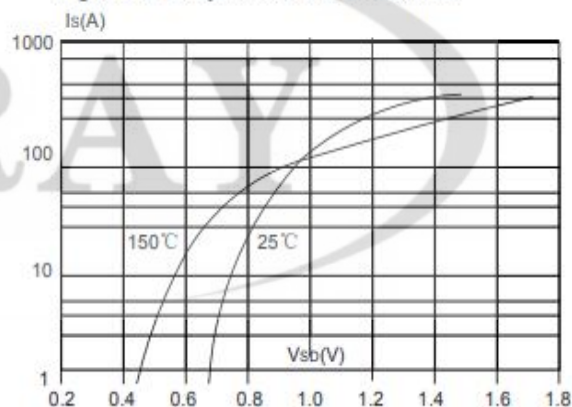
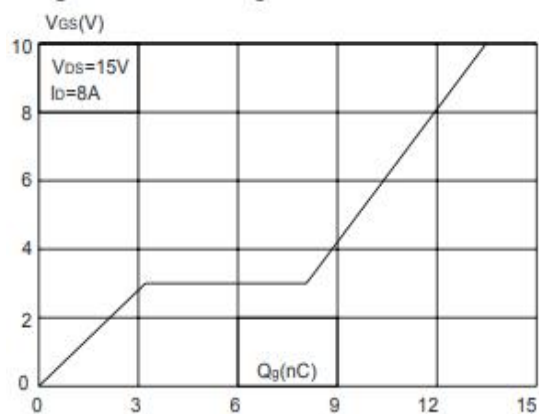
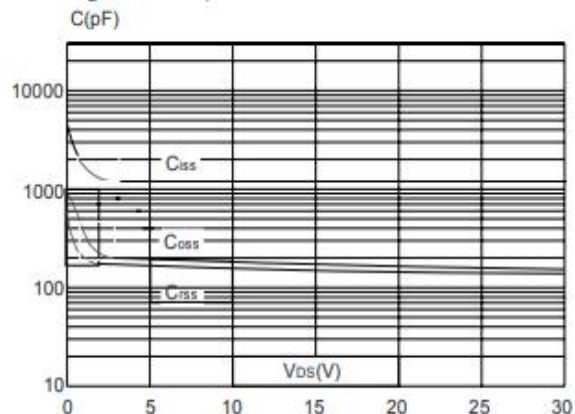
Electrical Characteristics(TJ=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters ③						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = 250μA	30			V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	1.0	1.5	2.5	V
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±20V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS = 30V, VGS =0V			1	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 15A		7.5	9	mΩ
		VGS = 4.5V, ID = 10A		12	14	mΩ
Dynamic Parameters ④						
Input Capacitance	Ciss	VDS = 15V,VGS =0V, f=1MHz		1116		pF
Output Capacitance	Coss			187		pF
Reverse Transfer Capacitance	Crss			152		pF
Total Gate Charge	Qg	VDS=15V, ID=8A, VGS=10V		13.3		nC
Gate Source Charge	Qgs			3.1		nC
Gate Drain Charge	Qgd			5		nC
Switching Parameters ④						
Turn-On DelayTime	td(on)	VDS=15V, ID=15A, RGEN=3Ω, VGS=10V		15		ns
Turn-On Rise Time	tr			19		ns
Turn-Off DelayTime	td(off)			35		ns
Turn-Off Fall Time	tf			21		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		Is			15	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM			60	
Drain to Source Diode Forward Voltage	VSD	VGS=0V, IS=15A			1.2	V
Body Diode Reverse Recovery Time	trr	IF=15A,dI/dt=100A/μs		14		ns
Body Diode Reverse Recovery Charge	Qrr			4.1		nC

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal 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 Electrical and Thermal Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

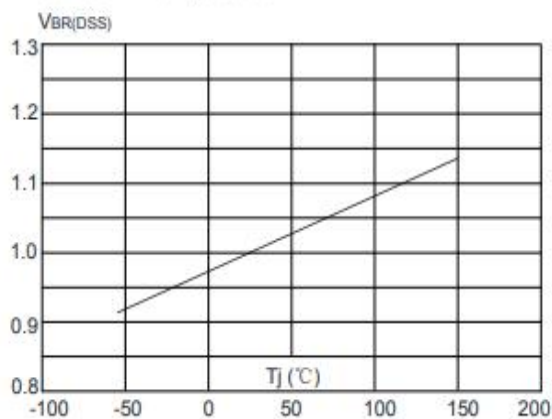


Figure 8: Normalized on Resistance vs. Junction Temperature

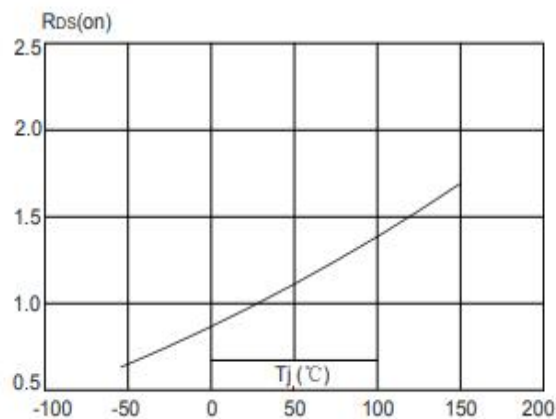


Figure 9: Maximum Safe Operating Area

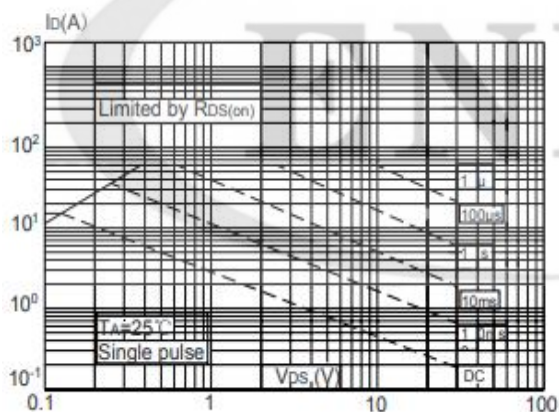


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

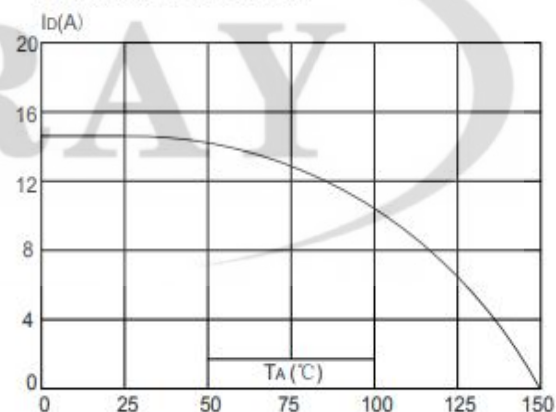
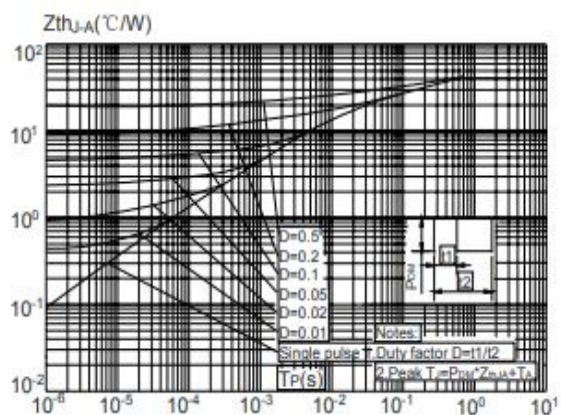
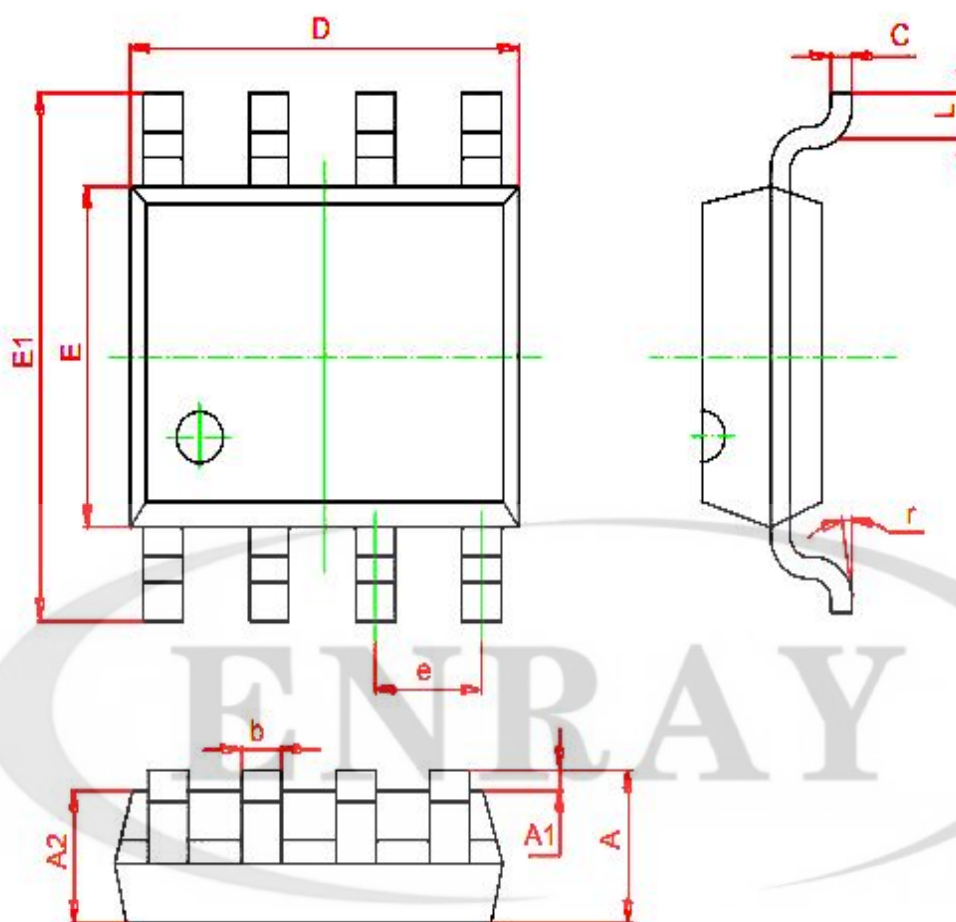


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



SOP-8 Package Outline Dimesions


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°