



**ER4407A**

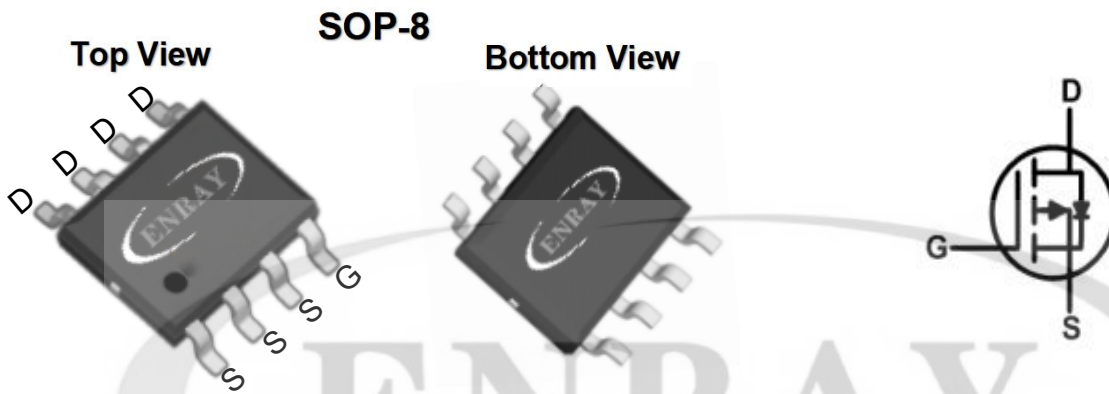
**-30V P-Channel MOSFET**

**Features**

The ER4407A is the high cell density trench dN-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The ER4407A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

**Product Summary**

V <sub>DS</sub>	-30V
I <sub>D</sub>	-12A
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-10V)	<14mΩ
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-4.5V)	< 24mΩ



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup>	I <sub>D@TA=25°C</sub>	-12	A
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup>	I <sub>D@TA =70°C</sub>	-9	
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	-46	
Single Pulse Avalanche Energy <sup>3</sup>	EAS	55	
Avalanche Current	IAS	-50	
Total Power Dissipation	PD@TA=25°C	4.5	
Storage Temperature Range	TSTG	-55 to 150	
Operating Junction Temperature Range	TJ	-55 to 150	°C

**Thermal Data**

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-ambient	R <sub>θJA</sub>	75	°C/W
Thermal Resistance Junction-ambient (t ≤10s)		40	
Thermal Resistance Junction-Case	R <sub>θJC</sub>	24	



**Electrical Characteristics(T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Parameters ③</b>						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = -250μA	-30			V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = -250μA	-1.0	-1.6	-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 = -10A		9.5	14	mΩ
		VGS = -4.5V, ID = -5A		17	24	mΩ
<b>Dynamic Parameters ④</b>						
Input Capacitance	Ciss	VDS=-15V , VGS=0V , f=1MHz		1770		pF
Output Capacitance	Coss			233		pF
Reverse Transfer Capacitance	Crss			206		pF
Total Gate Charge	Qg	VDS= -15V, ID= -5A, VGS= -10		22		nC
Gate Source Charge	Qgs			1.0		nC
Gate Drain Charge	Qgd			1.8		nC
<b>Switching Parameters ④</b>						
Turn-On DelayTime	td(on)	VDD= -15V, ID= -10A, VGS=-10V, RGEN=2.5Ω		9		ns
Turn-On Rise Time	tr			13		ns
Turn-Off DelayTime	td(off)			48		ns
Turn-Off Fall Time	tf			20		ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Maximum Continuous Drain to Source Diode Forward Current		IS			-12	A
Maximum Pulsed Drain to Source Diode Forward Current		ISM			-60	
Drain to Source Diode Forward Voltage	VSD	VGS=0V, IS= -15A		-0.8	-1.2	V
Reverse Recovery Time	trr	T <sub>J</sub> =25°C, VDD= -24V,IF=-2.8A, di/dt=-100A/μs		64		ns
Reverse Recovery Charge	Qrr			25		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

Figure 1: Output Characteristics

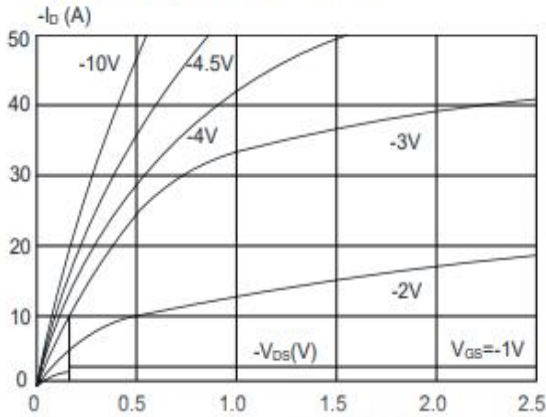


Figure 2: Typical Transfer Characteristics

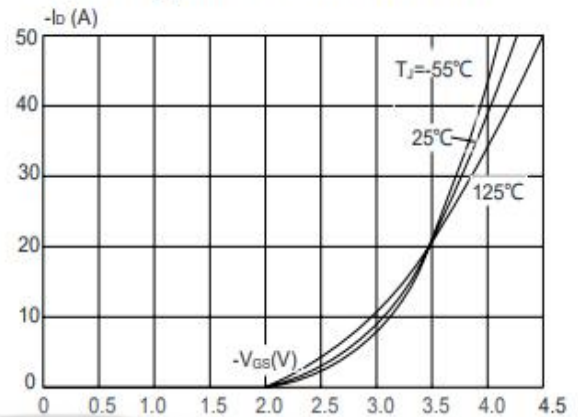


Figure 3: On-resistance vs. Drain Current

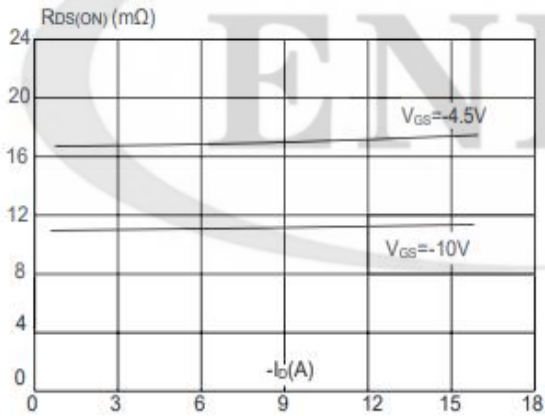


Figure 4: Body Diode Characteristics

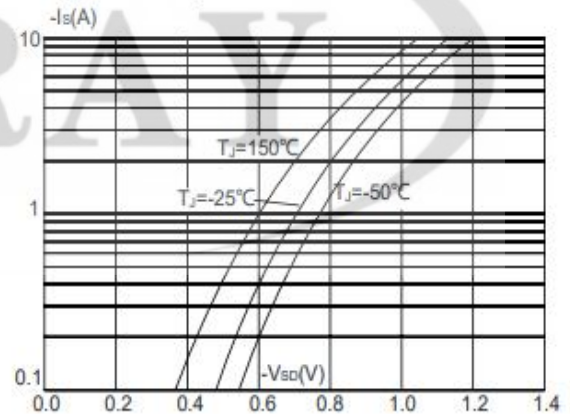


Figure 5: Gate Charge Characteristics

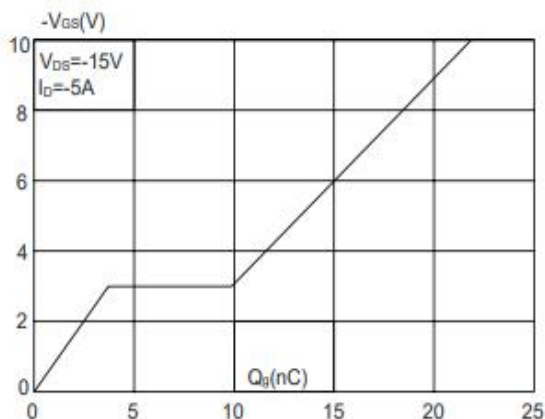
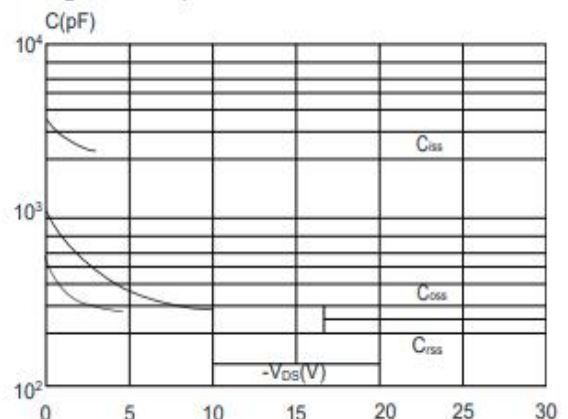


Figure 6: Capacitance Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

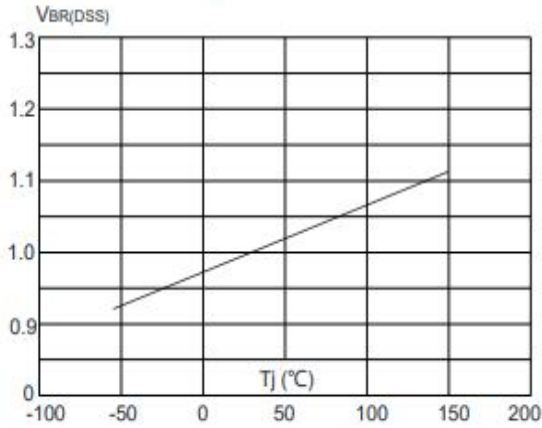


Figure 8: Normalized on Resistance vs. Junction Temperature

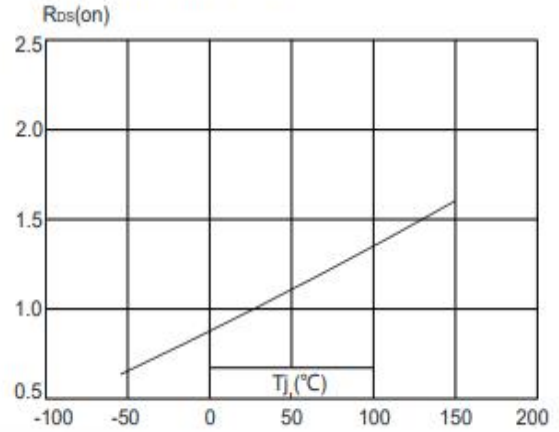


Figure 9: Maximum Safe Operating Area

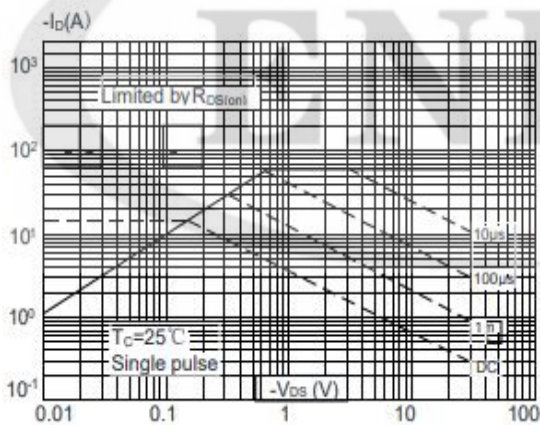


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

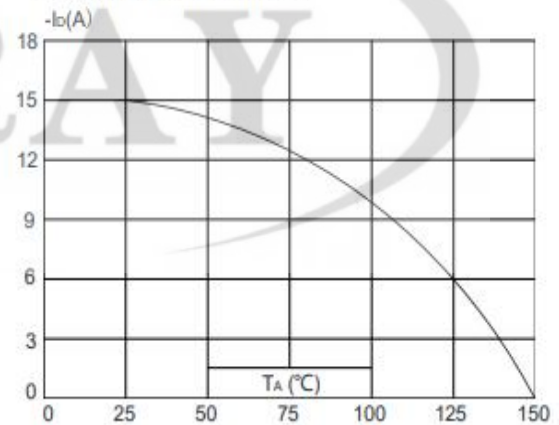
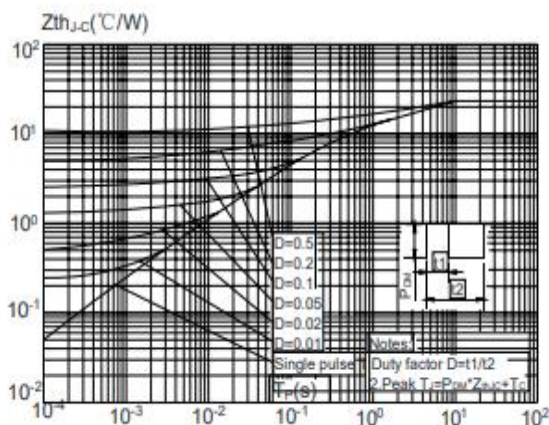
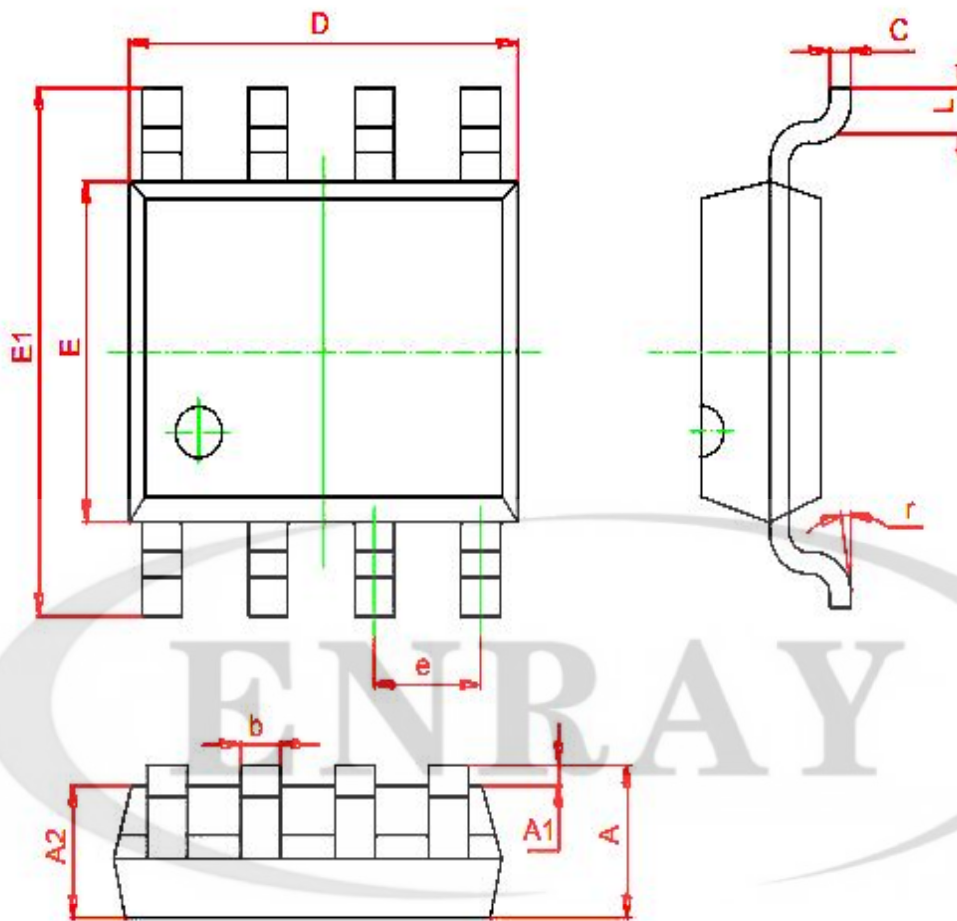


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



SOP-8 Package Outline Dimensions



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°