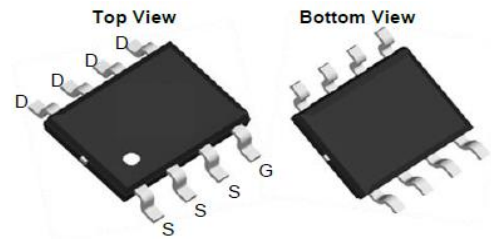


Features

The TW4409A is the high cell density trenched P-ch MOSFETs, which provide excellent R_{DS(ON)} and gate charge for most of the synchronous buck converter applications. The TW4409A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

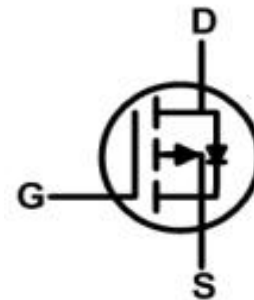
Pin Configurations



SOP-8

Product Summary

V _{DS}	-30V
I _D	-18A
R _{DS(ON)} (at V _{GS} =-10V)	<9.2mΩ
R _{DS(ON)} (at V _{GS} =-4.5V)	< 14mΩ



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	I _{D@TA=25°C}	-18	A
Continuous Drain Current	I _{D@TA =100°C}	-8.8	
Pulsed Drain Current ²	I _{DM}	-53	
Single Pulse Avalanche Energy ²	EAS	80	mJ
Total Power Dissipation	PD@TC=25°C	3	W
Storage Temperature Range	TSTG	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	
Thermal Data			
Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-ambient	RθJA	41.6	°C/W

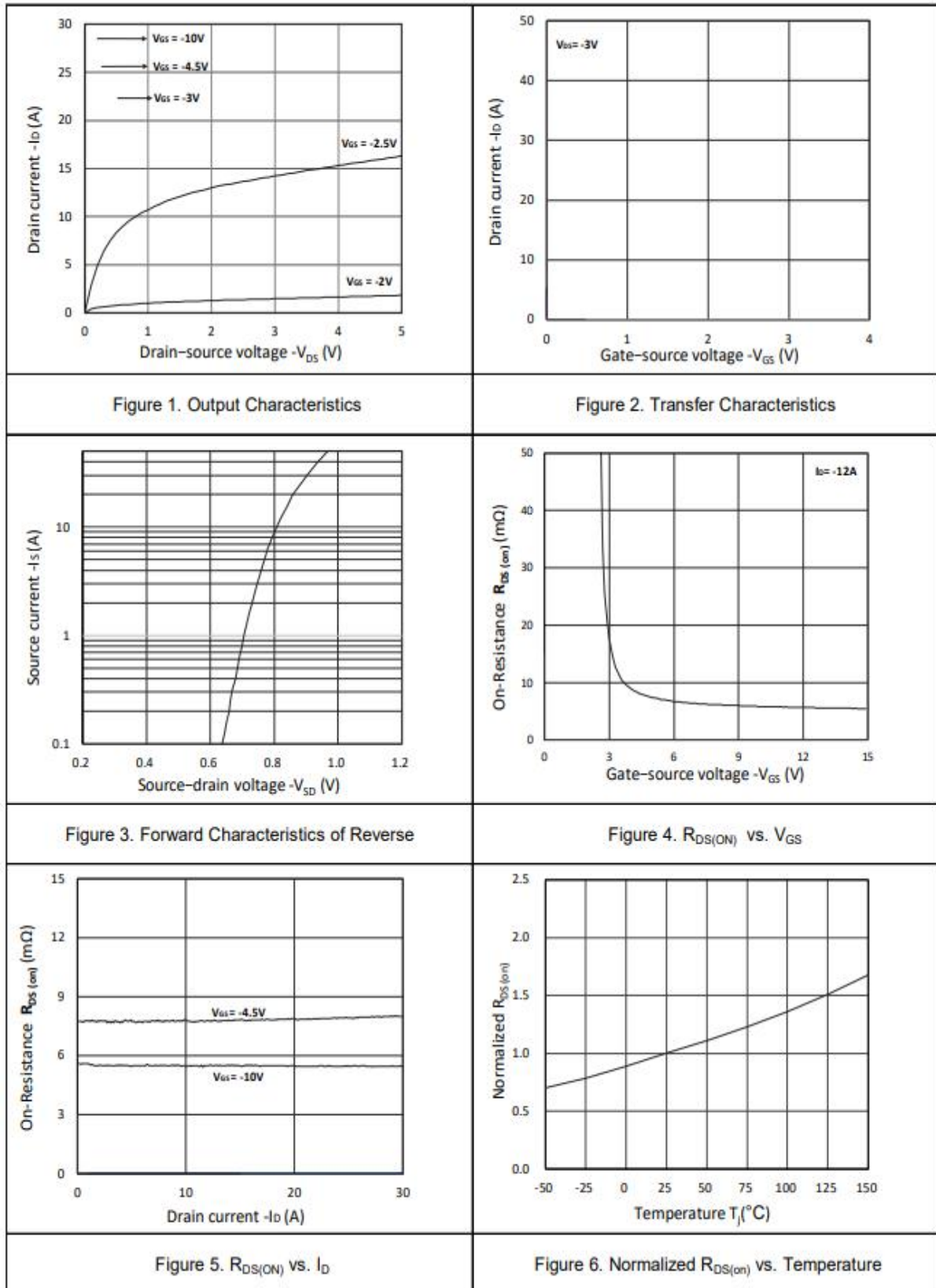
Electrical Characteristics(T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = -250μA	-1.0		-2.5	V
Gate-Body leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V			-1	μA
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -12A		7.5	9.2	mΩ
		V _{GS} = -4.5V, I _D = -10A		8.5	14	mΩ
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-15V , V _{GS} =0V , f=1MHz		3100		pF
Output Capacitance	C _{oss}			430		pF
Reverse Transfer Capacitance	C _{rss}			358		pF
Total Gate Charge	Q _g	V _{GS} = -10V, V _{DS} = -15V I _D = -12A		35		nC
Gate Source Charge	Q _{gs}			9.9		nC
Gate Drain Charge	Q _{gd}			10.5		nC
Switching Parameters						
Turn-On DelayTime	t _{d(on)}	V _{GS} =-10V, V _{DD} = -15V R _G = 3Ω, I _D = -12A		10.8		ns
Turn-On Rise Time	t _r			13.2		ns
Turn-Off DelayTime	t _{d(off)}			73		ns
Turn-Off Fall Time	t _f			35		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current ^{1,4}	I _S				-14	A
Diode Forward Voltage ²	V _{SD}	I _S = -1A, V _{GS} = 0V			-1.2	V

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



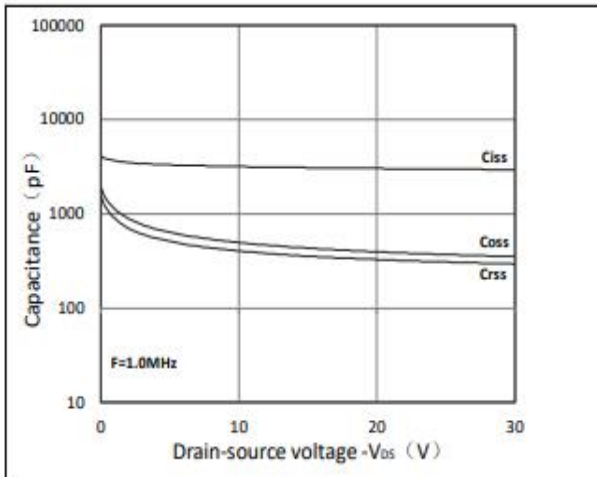


Figure 7. Capacitance Characteristics

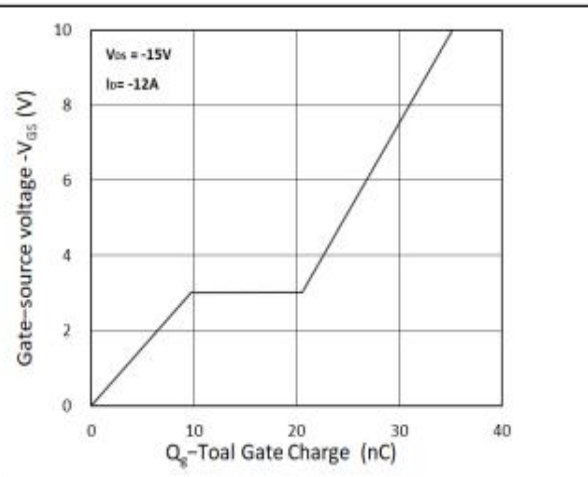


Figure 8. Gate Charge Characteristics

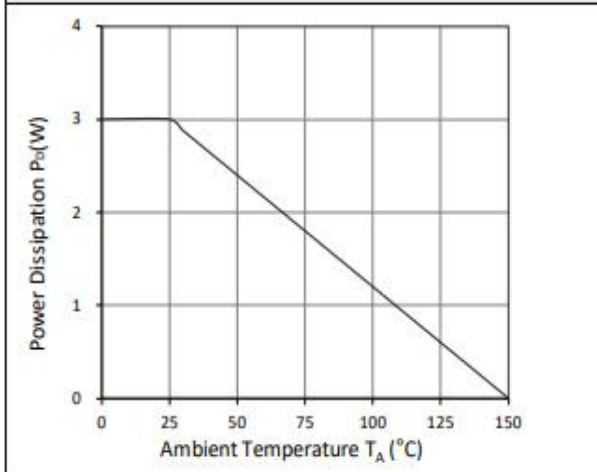


Figure 9. Power Dissipation

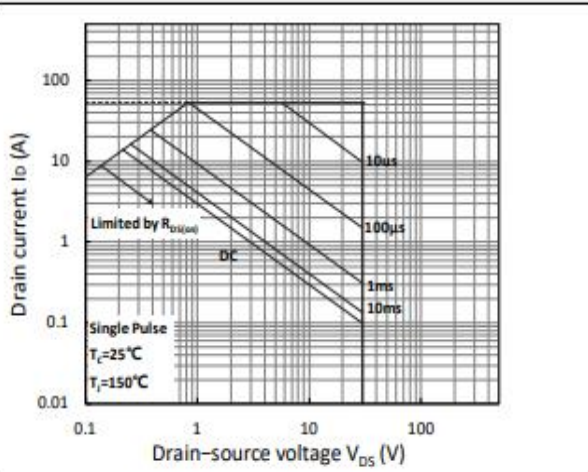


Figure 10. Safe Operating Area

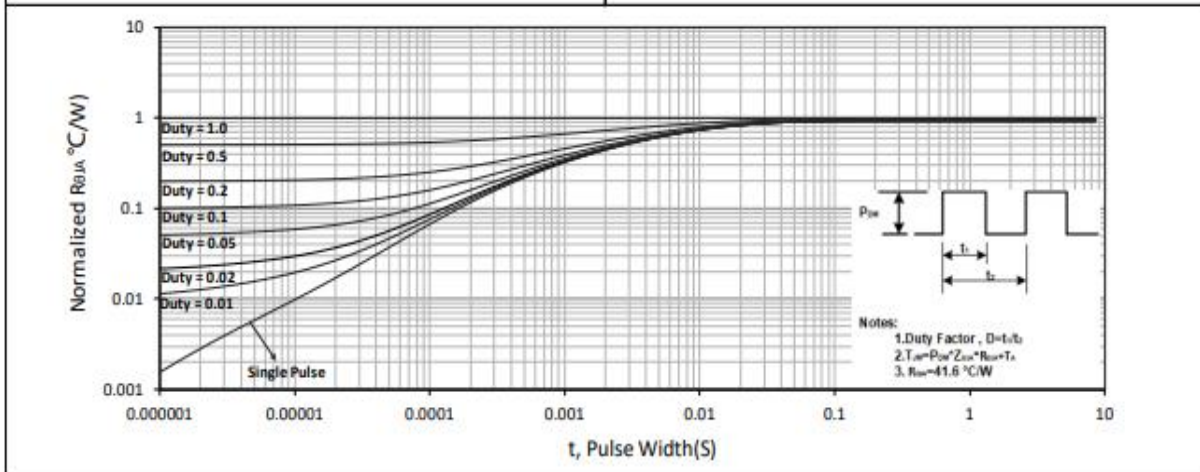
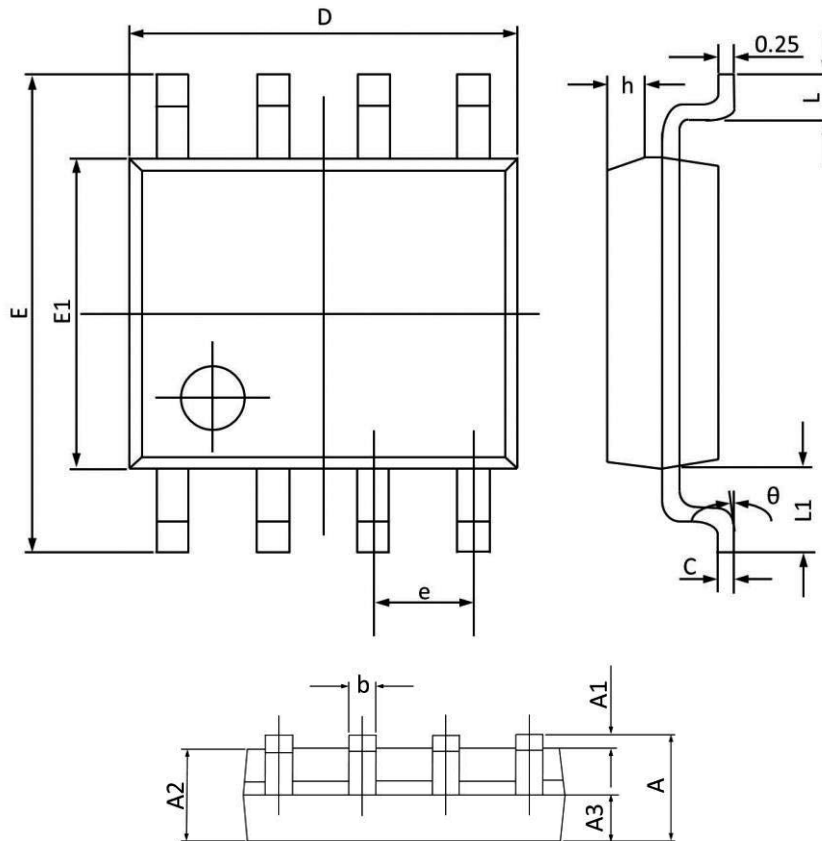


Figure 11. Normalized Maximum Transient Thermal Impedance

SOP8 PACKAGE INFORMATION



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	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.380	0.510	0.015	0.020
c	0.170	0.260	0.007	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.020
L	0.400	0.800	0.016	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°