

SuperMOS –SOP8 60V BV_{DSS}, 30mΩ R_{DS(ON)}, N-channel MOSFET

1. Description

The ESE6005AS is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R_{DS(ON)} with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product ESE6005AS is Pb-free.

2. Features

- 60V, R_{DS(ON)}=30mΩ(Typ.) @V_{GS}=10V
R_{DS(ON)}=36mΩ(Typ.) @V_{GS}=4.5V
 - Use trench MOSFET technology
 - High density cell design for low R_{DS(on)}
- Material: Halogen free
 - Reliable and rugged
 - Avalanche Rated
 - Low leakage current

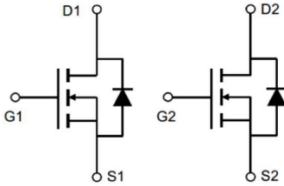
3. Applications

- PWM applications
 - Load switch
 - Power management in portable/desktop PCs
 - DC/DC conversion
- 100% UIS TESTED

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per Reel	Flammability Rating	Reel Sizes
ESE6005AS	SOP8	ES4946D/LOT	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	13 Inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
2	Gate2	Note b 	
1	Source2		
7/8	Drain2		
4	Gate1		
3	Source1		
5/6	Drain1		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV _{DSS}	60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _A =25°C	I _D	5	A
	T _A =100°C		3.3	
Maximum Power Dissipation		P _D	2	W
Pulsed Drain Current		I _{DM}	20	A
Avalanche Current, Single Pulsed ^a		I _{AS}	11.5	A
Avalanche Energy, Single Pulsed ^a		E _{AS}	33	mJ
Operating Junction Temperature		T _J	150	°C
Lead Temperature		T _L	260	°C
Storage Temperature Range		T _{stg}	-55 to 150	°C

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance	R _{θJA}		62.5	°C/W

Note:

a: T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25Ω

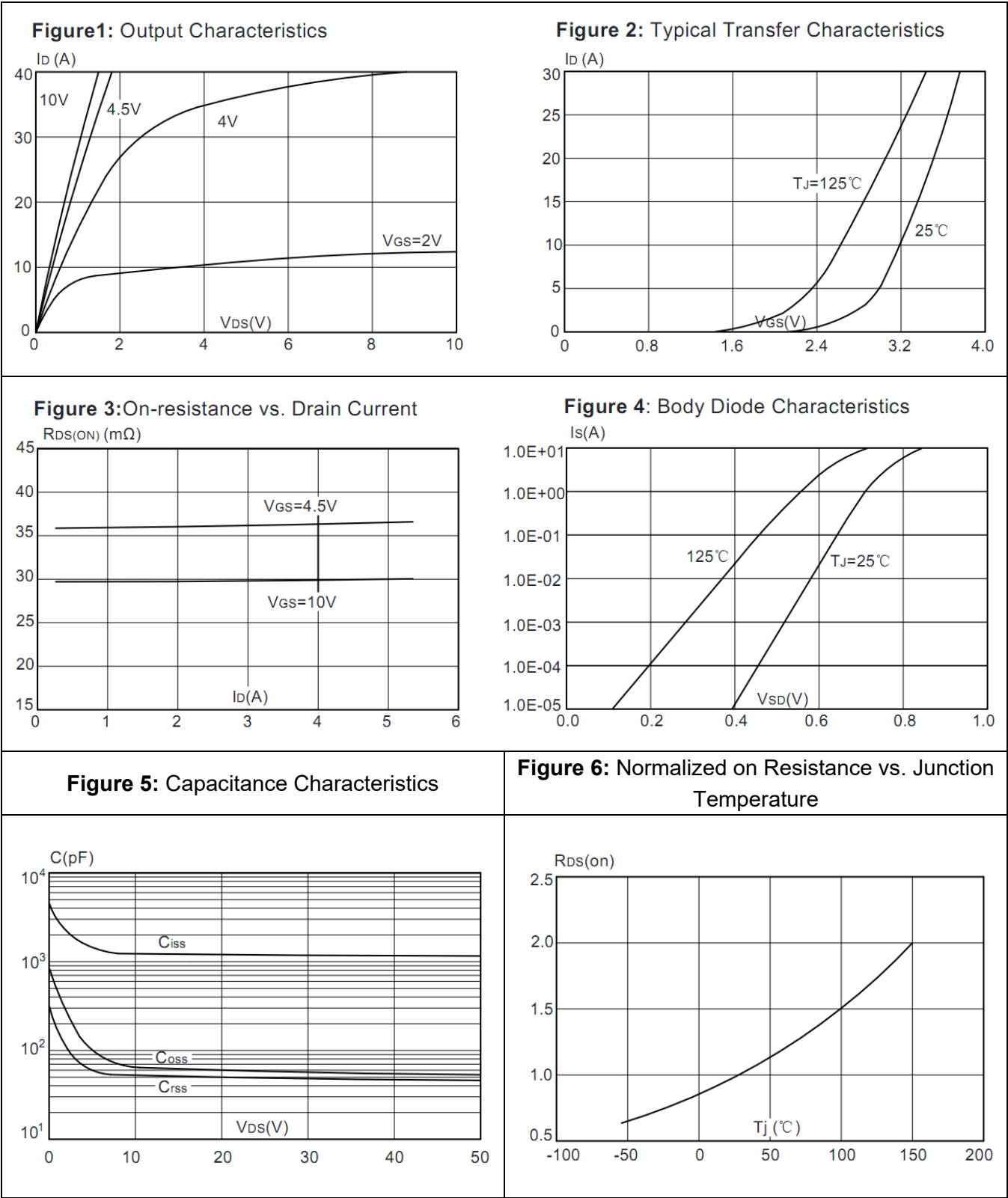
b: This diagram is only an electrical schematic, and the actual pin size is based on POD.

Electrical Characteristics

At TA = 25°C unless otherwise specified

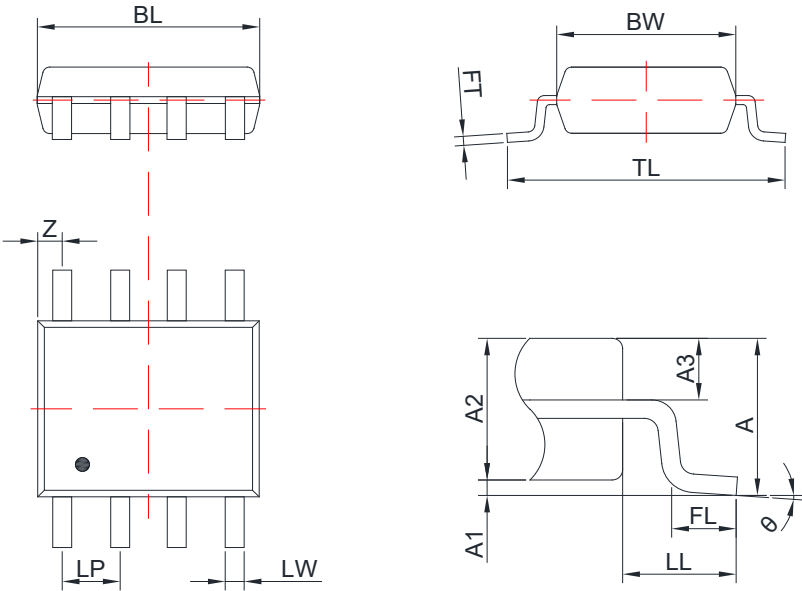
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	1.0	1.6	2.5	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =10V, I _D =5A		30	40	mΩ
		V _{GS} =4.5V, I _D =5A		36	50	
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =5A			40	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, f=1MHz, V _{DS} =25V		1150		pF
Output Capacitance	C _{OSS}			59		
Reverse Transfer Capacitance	C _{RSS}			50		
Total Gate Charge	Q _{G(TOT)}	V _{GS} =10V, V _{DS} =30V, I _D =2.5A		21		nC
Gate-to-Source Charge	Q _{GS}			4		
Gate-to-Drain Charge	Q _{GD}			5.5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =30V, I _D =5A, R _G =1.8Ω		8		ns
Rise Time	t _r			20		
Turn-Off Delay Time	t _{d(OFF)}			15		
Fall Time	t _f			25		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =5A			1.5	V

7. Typical Characteristic



8. Dimension (SOP8)

POD A(Y)



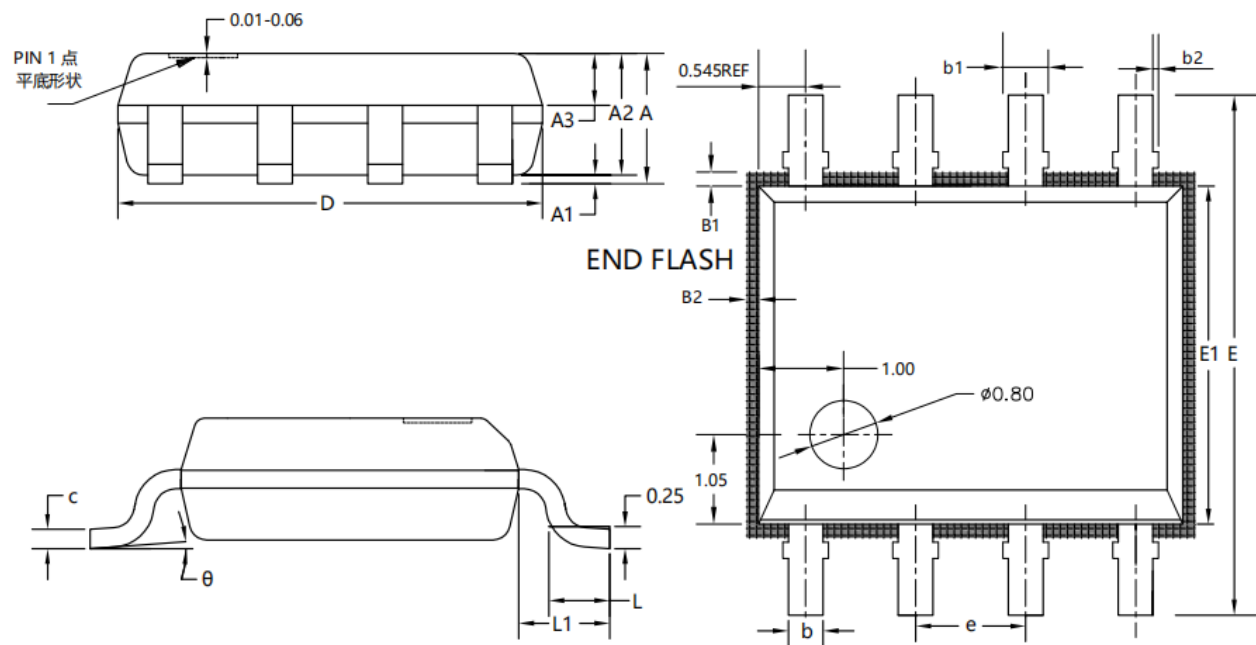
COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	1.75		FL	0.50	0.80
A1	0.05	0.15	LP	1.25	1.30
A2	1.40	1.50	LL	1.1 BSC	
A3	0.623 BSC		LW	0.38	0.43
BL	4.92	5.08	TL	5.90	6.10
BW	3.70	4.10	Z	0.54	
FT	0.20	0.21	θ	0°	8°

ESE6005AS

Rev-1.5

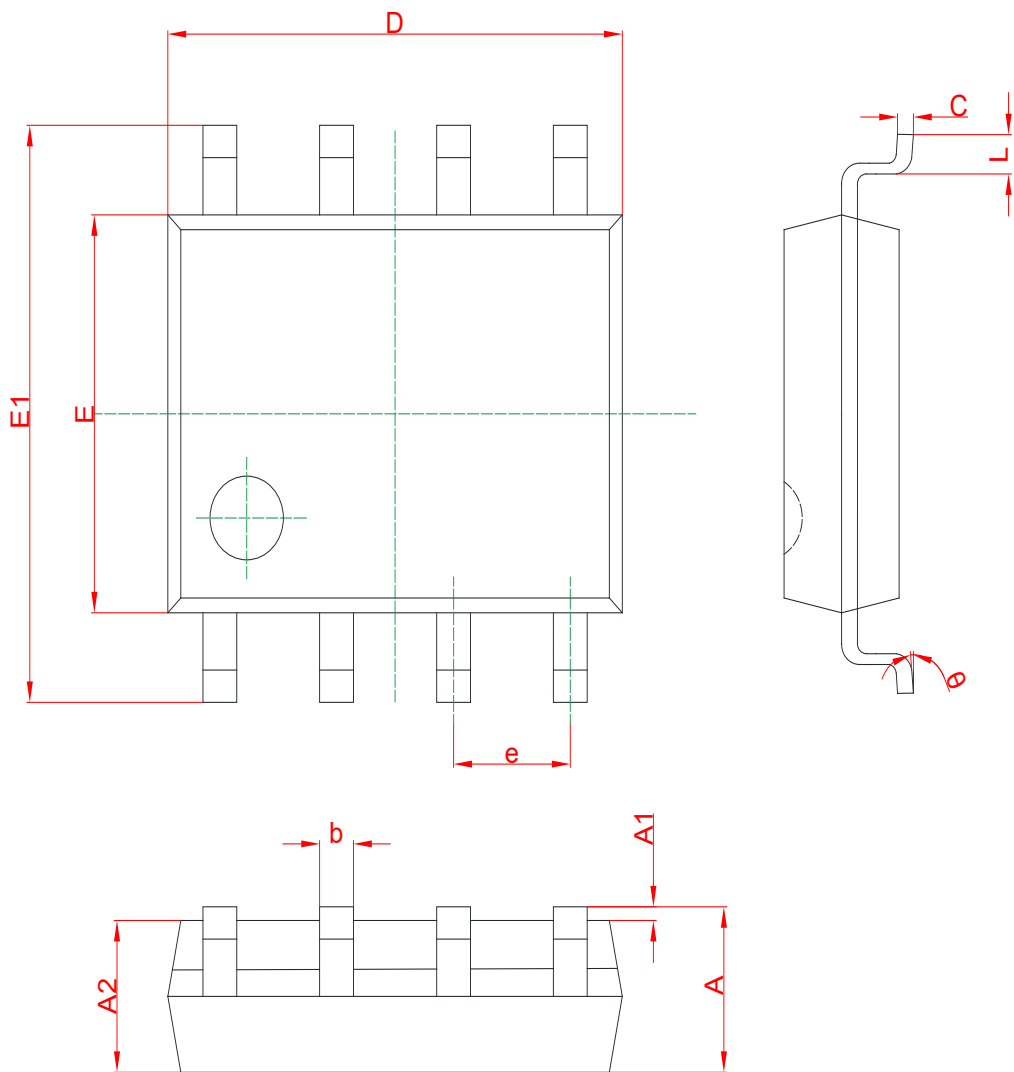
POD B(C)



COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

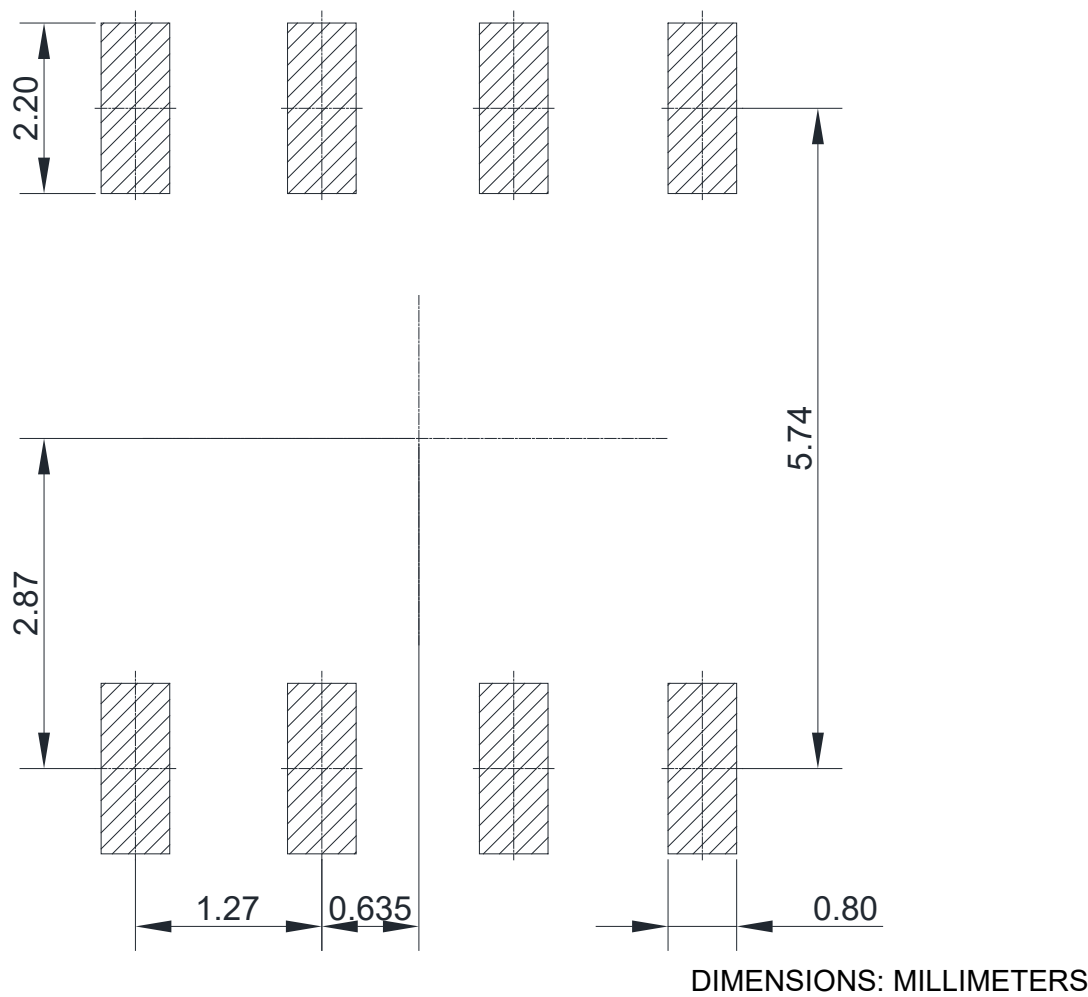
Symbol	Dimensions			Symbol	Dimensions		
	Min.	NOM.	Max.		Min.	NOM.	Max.
A	1.55	1.65	1.75	L	0.50	0.60	0.70
A1	0.06	0.11	0.16	L1	0.90	1.05	1.20
A2	1.35	1.45	1.55	θ	0°	4°	8°
A3	0.60	0.70	0.80	B1	0.14MAX		
b	0.30	0.40	0.50	B2	0.12MAX		
c	0.17	0.20	0.25	b1	0.66MAX		
D	4.80	4.90	5.00	b2	0	0.04	0.08
E	5.80	6.00	6.20	e	1.27BSC		
E1	3.80	3.90	4.00				

POD C(X)



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
L	0.40	0.60	e	1.27 TYP	
D	4.95	5.05	c	0.15	0.25
E	3.8	4.0	A2	1.33	1.50
E1	5.80	6.20	A1	0.04	0.20
b	0.4 TYP		θ	0°	8°

9. Recommended Soldering Footprint



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