

**SuperMOS – SOP8 -30V  $BV_{DSS}$ , 13.5m $\Omega$   $R_{DS(on)}$ , P-channel MOSFET**

**1. Description**

The SI4435DY-ES is P-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 SI4435DY-ES is Pb-free.

**2. Features**

- -30V,  $R_{DS(ON)}$ =13.5m $\Omega$ (TYP.) @ $V_{GS}$ =-10V
- $R_{DS(ON)}$ =18.5m $\Omega$ (TYP.) @ $V_{GS}$ =-4.5V
- Fast Switching
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

**3. Applications**

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

**4. Ordering Information**

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Sizes
SI4435DY-ES	SOP8	SI4435DY-ES/lot	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

**5. Pin Configuration and Functions**

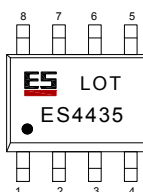
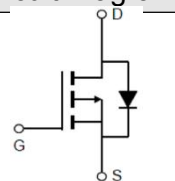
Pin	Function	Outline	Circuit Diagram
4	Gate		
1/2/3	Source		
5/6/7/8	Drain		

Table-2 Pin configuration

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$BV_{DSS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	±25	V	
Continuous Drain Current	$I_D$	$T_A=25^{\circ}C$	-10.5	A
		$T_A=70^{\circ}C$	-8.0	
Maximum Power Dissipation	$P_D$	$T_A=25^{\circ}C$	3.1	W
		$T_A=70^{\circ}C$	2.0	
Pulsed Drain Current	$I_{DM}$	-80	A	
Avalanche Current, Single Pulsed <sup>a</sup>	$I_{AS}$	-18.5	A	
Avalanche Energy, Single Pulsed <sup>a</sup>	$E_{AS}$	51	mJ	
Operating Junction Temperature	$T_J$	150	°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	$R_{\theta JA}$	32	40	°C/W
Junction-to-Lead Thermal Resistance	$R_{\theta JL}$	3.2	4	

Note:

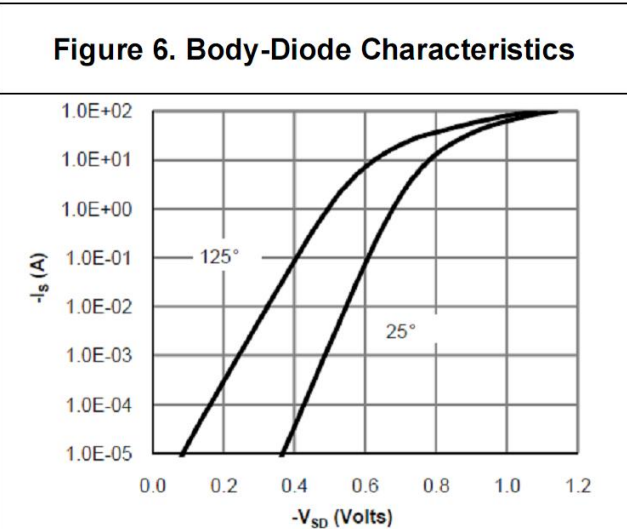
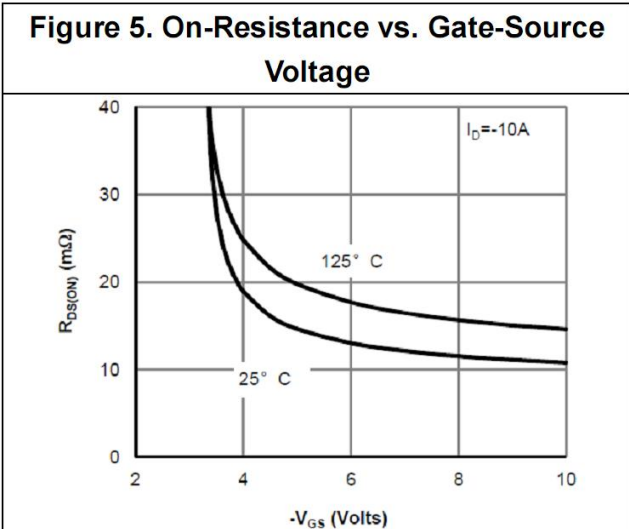
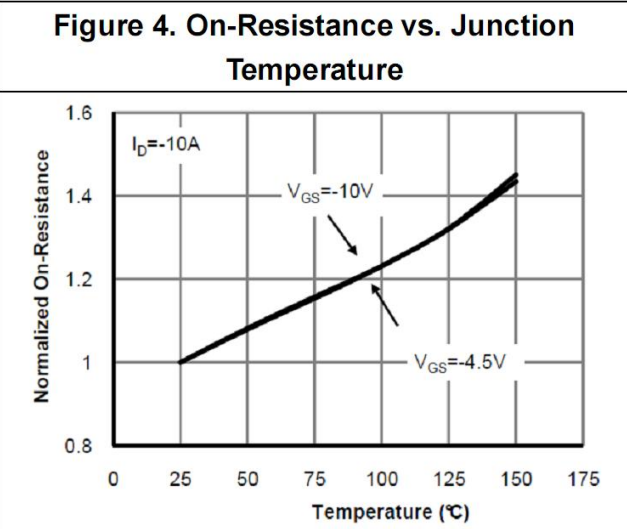
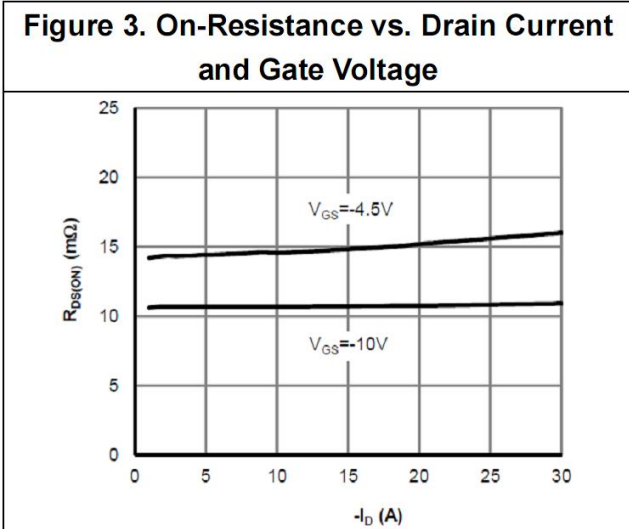
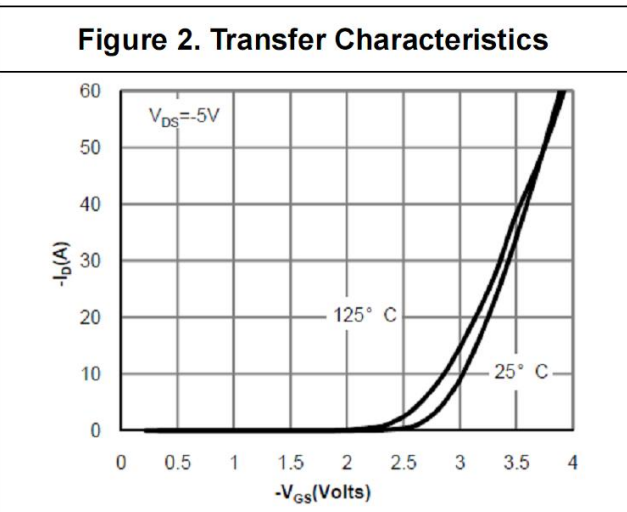
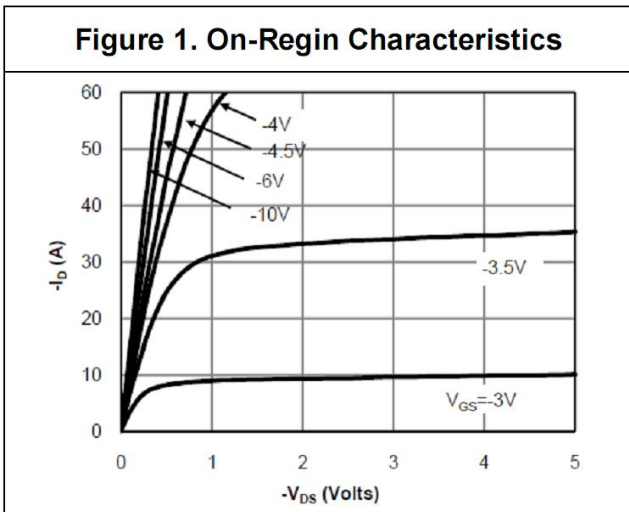
a:  $T_J=25^{\circ}C, V_{DD}=-30V, V_G=-10V, L=0.3mH, R_g=25\Omega$

## Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=-30V$			-1	$\mu A$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 25V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-1.5	-2.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-10A$		13.5	21	m $\Omega$
		$V_{GS}=-4.5V, I_D=-7A$		18.5	27	
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V$ $V_{DS}=-15V$ $f=1MHz$		1230		pF
Output Capacitance	$C_{OSS}$			160		
Reverse Transfer Capacitance	$C_{RSS}$			145		
Gate Resistance	$R_g$	$f=1MHz$		10		$\Omega$
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-10A$		26.4		nC
Gate-to-Source Charge	$Q_{GS}$			6		
Gate-to-Drain Charge	$Q_{GD}$			4.3		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=1\Omega$ $R_G=3\Omega$		18		ns
Rise Time	$t_r$			22		
Turn-Off Delay Time	$t_{d(OFF)}$			55		
Fall Time	$t_f$			42		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_{SD}=-1.0A$		-0.75	-1	V

7. Typical Characteristic



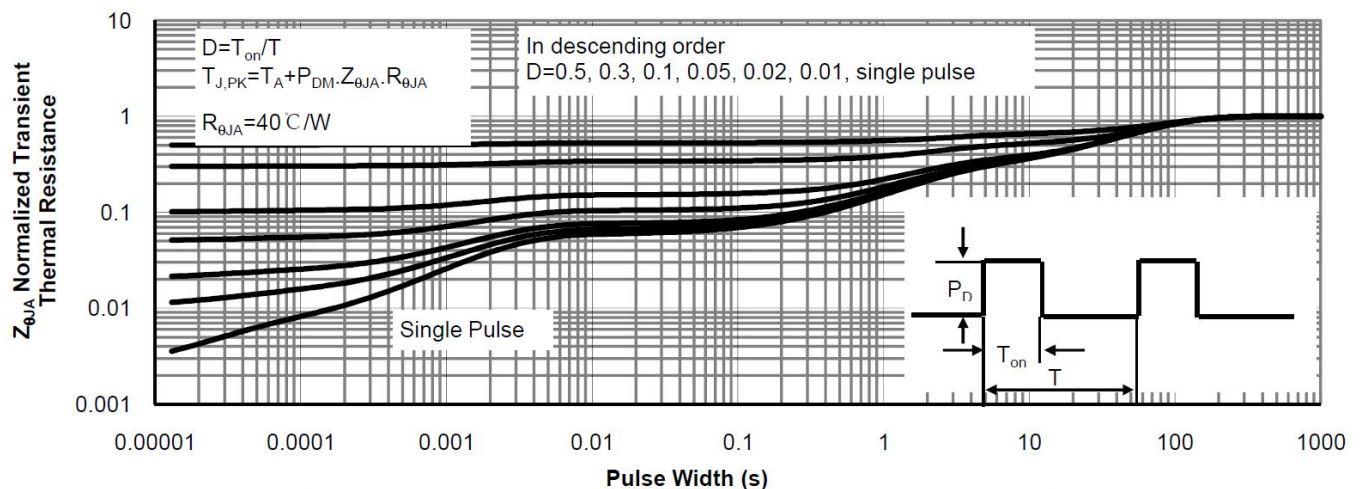
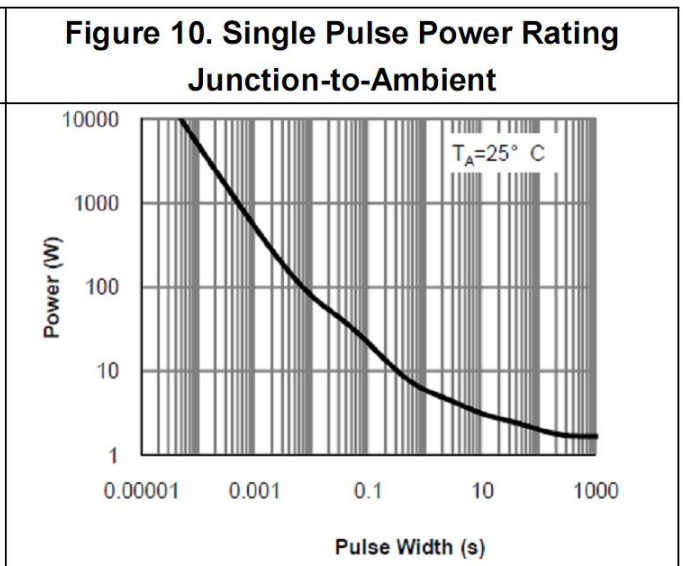
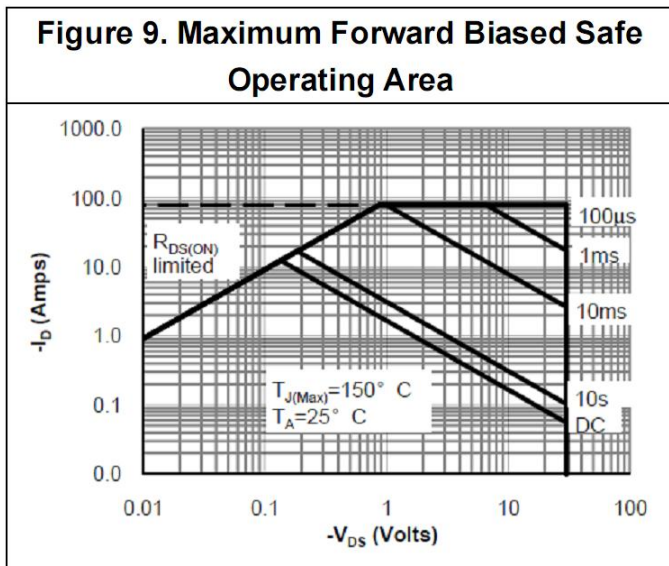
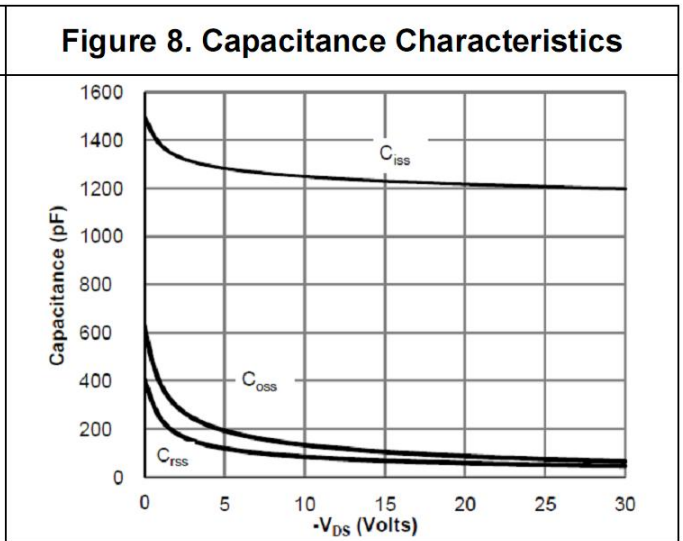
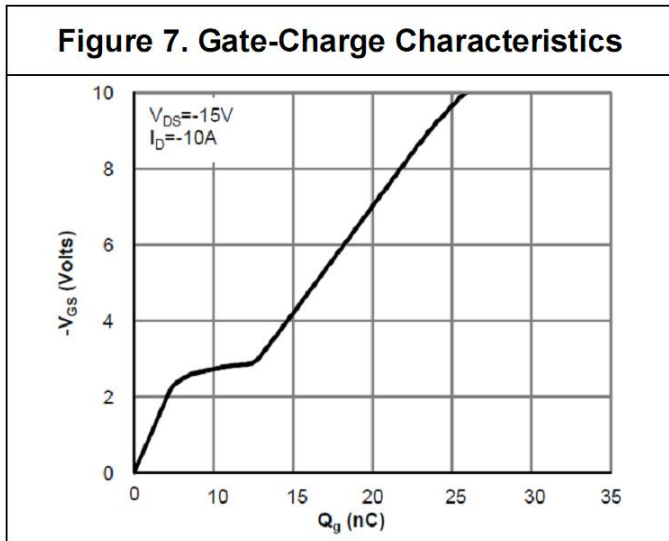
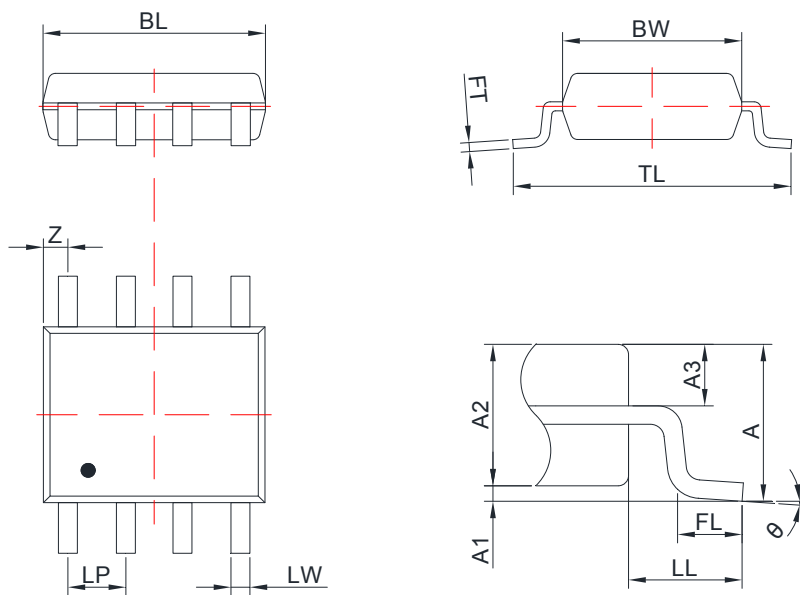


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

**8. Dimension (SOP8)**



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	4.80	5.00	TL	5.90	6.10
BW	3.70	4.10	Z	0.54	
FT	0.20	0.21	θ	0°	8°

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