

SuperMOS–PDFN5*6-8L 30V BV_{DSS}, 1.15mΩ R_{DS(on)},N-channel MOSFET

1. Description

The AON6512-ES 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 AON6512-ES is Pb-free.

2. Features

- 30V, R_{DS(ON)}=1.15mΩ(TYP.) @V_{GS}=10V
- R_{DS(ON)}=1.5mΩ(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 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 Size
AON6512-ES	PDFN5*6-8L	ESN6512/lot	Halogen free	Tape & Reel	5,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

5. Pin Configuration and Functions


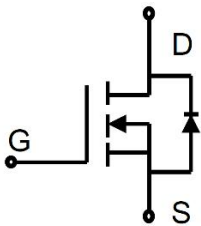
Pin	Function	Outline	Circuit Diagram
4	Gate		
1/2/3	Source		
5/6/7/8	Drain		

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}	±20	V
Continuous Drain Current	I_D	$T_C=25^{\circ}C$	120
		$T_C=100^{\circ}C$	78
Maximum Power Dissipation	P_D	$T_C=25^{\circ}C$	120
		$T_C=100^{\circ}C$	48
Pulsed Drain Current ^a	I_{DM}	480	A
Avalanche Current (L=0.5mH)	I_{AS}	43	A
Avalanche energy	E_{AS}	462	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	Unit
Junction-to-Case Thermal Resistance ^a	$R_{\theta JC}$	1.04	°C/W

Note:

a: Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

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}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1.0	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.5	2.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		1.15	1.5	m Ω
		$V_{GS}=4.5V, I_D=20A$		1.5	2.2	m Ω
Forward Trans conductance	g_{FS}	$V_{DS}=5.0V, I_D=20A$			150	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS}=0V, f=1MHz,$ $V_{DS}=15V$		4050		pF
Output Capacitance	C_{OSS}			1710		
Reverse Transfer Capacitance	C_{RSS}			140		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=10V, V_{DS}=10V,$ $I_D=30A$		68		nC
Gate-to-Source Charge	Q_{GS}			12		
Gate-to-Drain Charge	Q_{GD}			17		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=50A, R_G=1\Omega$		18		ns
Rise Time	t_r			11		
Turn-Off Delay Time	$t_{d(OFF)}$			64		
Fall Time	t_f			11		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$	0.45		1.2	V

7. Typical Characteristic

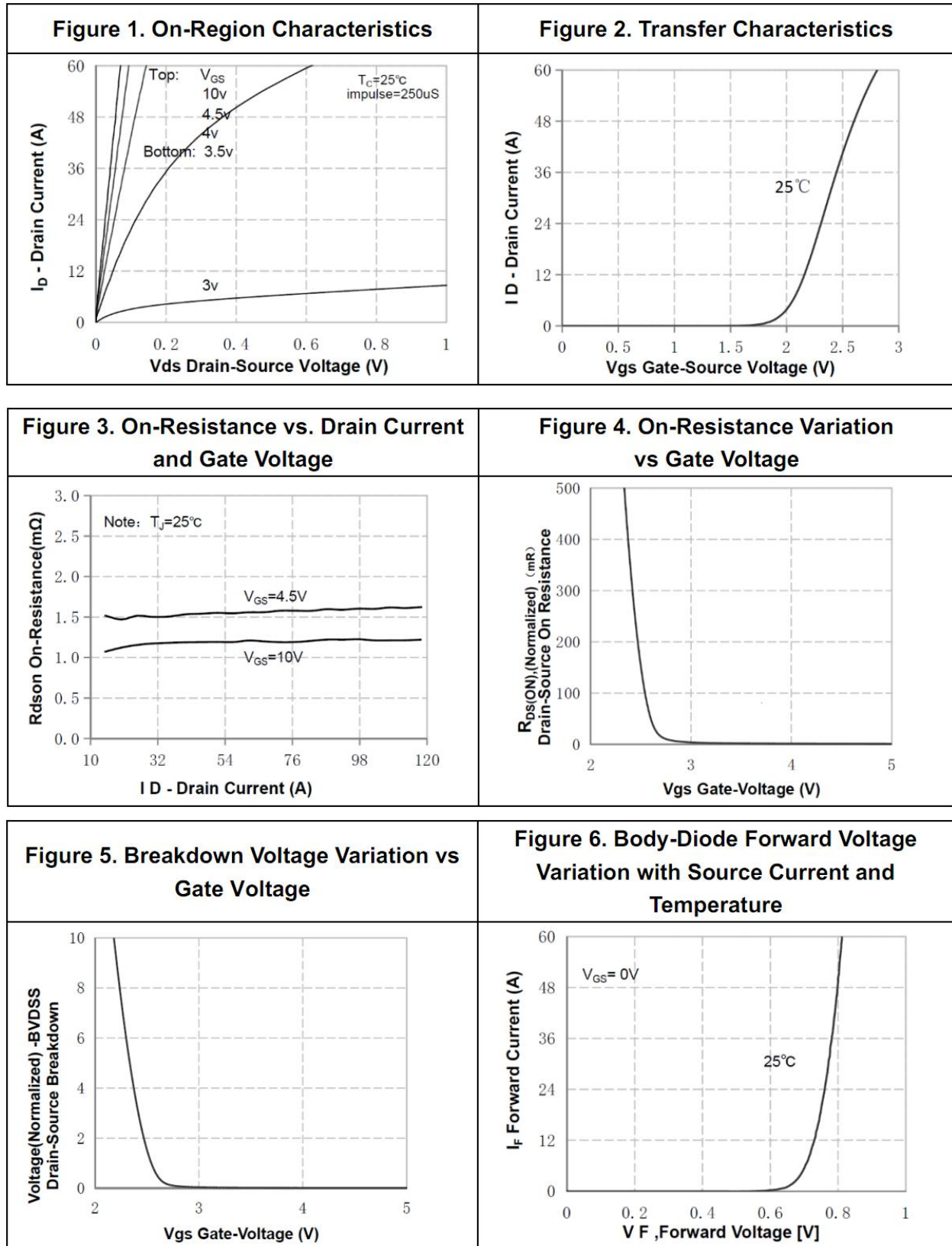


Figure 7. Gate-Charge Characteristics

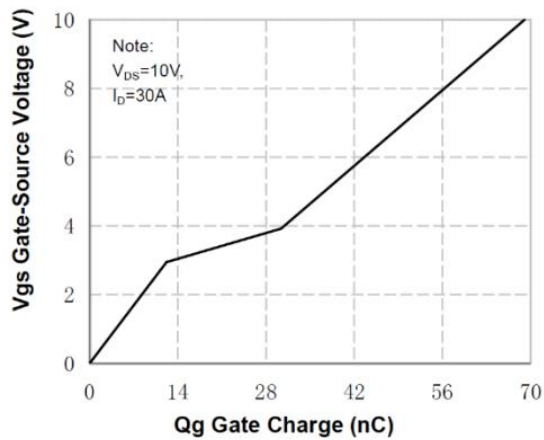


Figure 8. Capacitance Characteristics

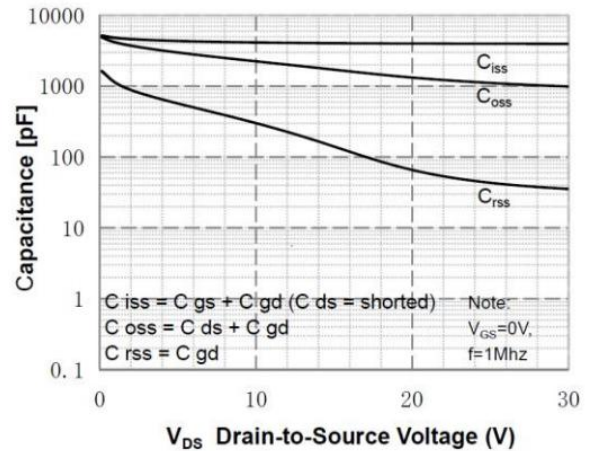


Figure 9. Maximum Forward Biased Safe Operating Area

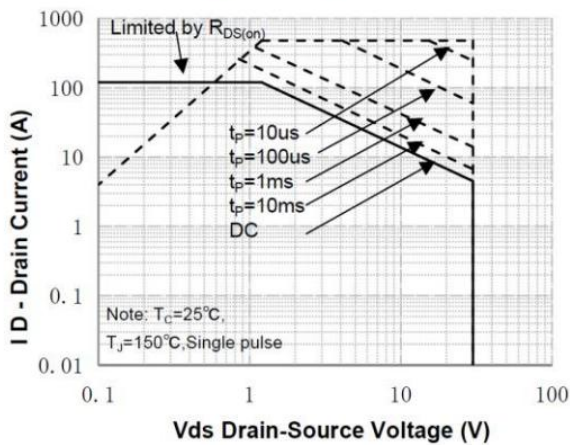


Figure 10. Maximum PContinuous Drain Current vs Case Temperature

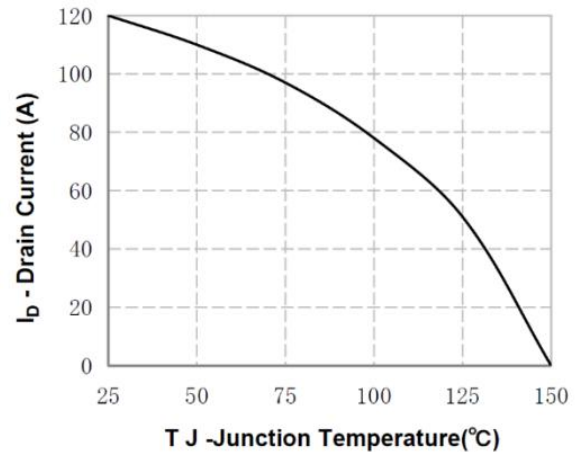
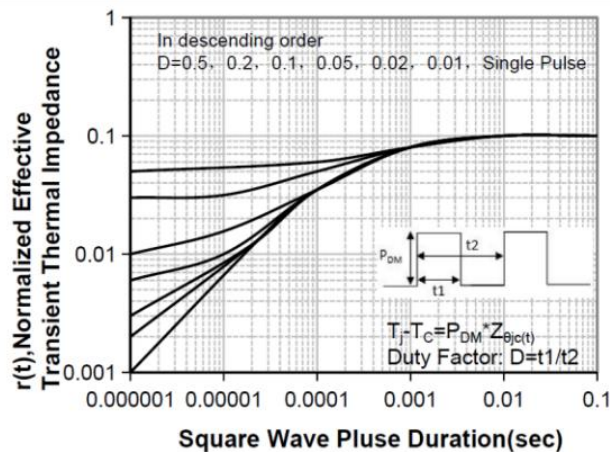
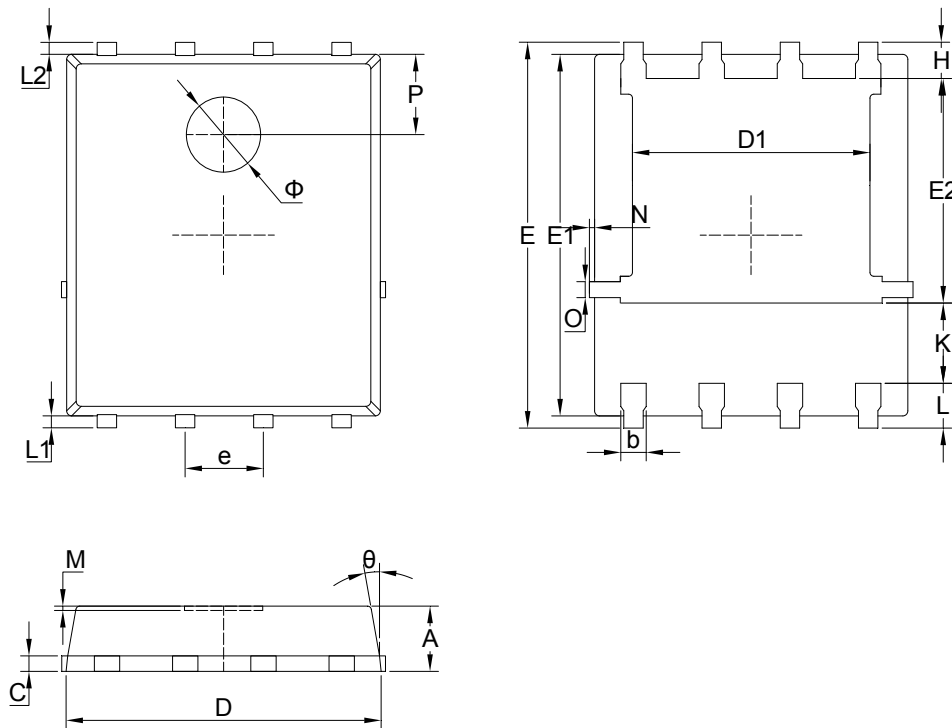


Figure 11. Normalized Maximum Transient Thermal Impedance



8. Dimension (PDFN5*6-8L)



Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.90	1.05	1.20	H	0.48	0.58	0.68
b	0.35	0.40	0.50	K	1.17	1.27	1.37
C	0.20	0.25	0.35	L	0.64	0.74	0.84
D	4.90	5.05	5.20	L1/L2	0.20 REF.		
D1	3.72	3.82	3.92	theta	8°	10°	12°
E	6.00	6.15	6.30	M	0.08 REF.		
E1	5.60	5.75	5.90	N	0	-	0.15
E2	3.47	3.57	3.67	O	0.25 REF.		
e	1.27 BSC.			P	1.28 REF.		
phi	1.20 REF						

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