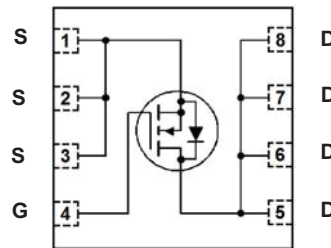


## N-Channel MOSFET

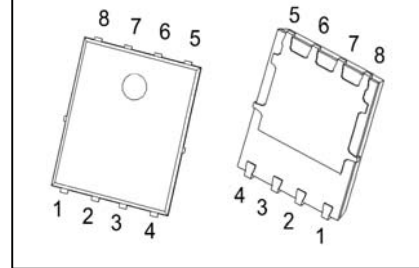
## AON6512 (KON6512)

## ■ Features

- $V_{DS} (V) = 30 V$
- $I_{D(MAX)} (at V_{GS} = 10 V) = 150 A$
- $R_{DS(ON)} (at V_{GS} = 10 V) < 1.7 m\Omega$
- $R_{DS(ON)} (at V_{GS} = 4.5 V) < 2.4 m\Omega$
- Low Gate Charge
- High Current Capability



DFN5x6-8(PDFNWB5x6-8L)

■ Absolute Maximum Ratings ( $T_A = 25^\circ C$  unless otherwise noted)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current <sup>G</sup>	$I_D$	$T_C = 25^\circ C$	A	
		$T_C = 100^\circ C$		
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	340		
Continuous Drain Current	$I_{DSM}$	$T_A = 25^\circ C$		54
		$T_A = 25^\circ C$	43	
Avalanche Current <sup>C</sup>	$I_{AS}$	70		
Avalanche Energy $L = 0.05 mH$ <sup>C</sup>	$E_{AS}$	123	mJ	
Vds Spike	100ns	$V_{SPIKE}$	36	V
Power Dissipation <sup>B</sup>	$P_D$	$T_C = 25^\circ C$	W	
		$T_C = 100^\circ C$		
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A = 25^\circ C$		7.4
		$T_A = 70^\circ C$		4.7
Thermal Resistance.Junction- to-Ambient <sup>A</sup>	$t \leq 10s$	$R_{thJA}$	17	$^\circ C/W$
Thermal Resistance.Junction- to-Ambient <sup>A,D</sup>	Steady-State		55	
Thermal Resistance.Junction- to-Case	Steady-State	$R_{thJC}$	1.5	
Junction Temperature	$T_J$		150	$^\circ C$
Storage Temperature Range	$T_{stg}$		-55 to 150	

Notes:

- The value of  $R_{thJA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ . The Power dissipation  $P_{DSM}$  is based on  $R_{thJA}$  and the maximum allowed junction temperature of  $150^\circ C$ . The value in any given application depends on the user's specific board design.
- The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 150^\circ C$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- Single pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ C$ .
- The  $R_{thJA}$  is the sum of the thermal impedance from junction to case  $R_{thJC}$  and case to ambient.
- The maximum current rating is package limited.

## N-Channel MOSFET

## AON6512 (KON6512)

■ Electrical Characteristics ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DS}$	$I_D = 250\ \mu\text{A}$ , $V_{GS} = 0\text{V}$	30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\text{V}$ , $V_{GS} = 0\text{V}$			1	$\mu\text{A}$
		$V_{DS} = 30\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 55^\circ\text{C}$			5	
Gate to Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$	1		2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$			1.7	m $\Omega$
		$V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$ , $T_J = 125^\circ\text{C}$			2.3	
		$V_{GS} = 4.5\text{V}$ , $I_D = 20\text{A}$			2.4	
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{V}$ , $I_D = 20\text{A}$		85		S
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 15\text{V}$ , $f = 1\text{MHz}$		3430		pF
Output Capacitance	$C_{oss}$			1327		
Reverse Transfer Capacitance	$C_{rss}$			175		
Gate Resistance	$R_g$	$V_{GS} = 0\text{V}$ , $V_{DS} = 0\text{V}$ , $f = 1\text{MHz}$	0.3		1.1	$\Omega$
Total Gate Charge	$Q_g(10\text{V})$	$V_{GS} = 10\text{V}$ , $V_{DS} = 15\text{V}$ , $I_D = 20\text{A}$		53	64	nC
Total Gate Charge	$Q_g(4.5\text{V})$			25	30	
Gate Source Charge	$Q_{gs}$			7.8		
Gate Drain Charge	$Q_{gd}$			10.3		
Turn-On Delay Time	$t_{d(on)}$			7.5		
Turn-On Rise Time	$t_r$	$V_{GS} = 10\text{V}$ , $V_{DS} = 15\text{V}$ , $R_L = 0.75\ \Omega$ , $R_{GEN} = 3\ \Omega$		5.0		ns
Turn-Off Delay Time	$t_{d(off)}$			33.8		
Turn-Off Fall Time	$t_f$			9.8		
Body Diode Reverse Recovery Time	$t_{rr}$		$I_F = 20\text{A}$ , $di/dt = 500\text{A}/\mu\text{s}$		22	
Body Diode Reverse Recovery Charge	$Q_{rr}$			58		nC
Maximum Body-Diode Continuous Current	$I_S$				85	A
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{V}$ , $I_S = 1\text{A}$			1	V

Notes:

E. The static characteristics in Figures 1 to 6 are obtained using &lt;300s pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)} = 150^\circ\text{C}$ . The SOA curve provides a single pulse rating.H. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

## N-Channel MOSFET

### AON6512 (KON6512)

■ Typical Characteristics

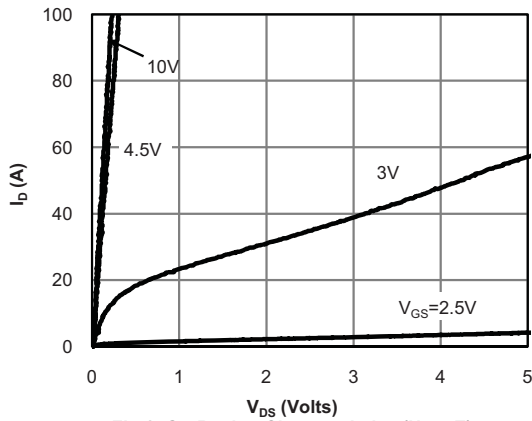


Fig 1: On-Region Characteristics (Note E)

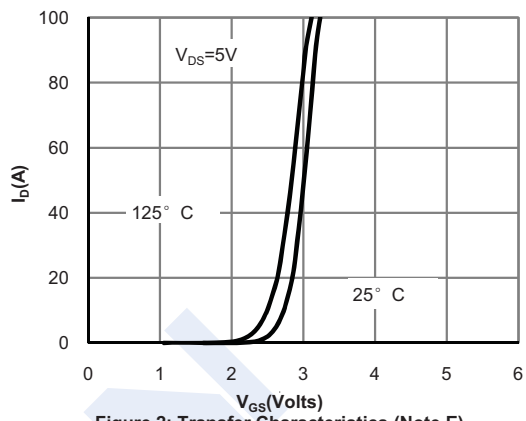


Figure 2: Transfer Characteristics (Note E)

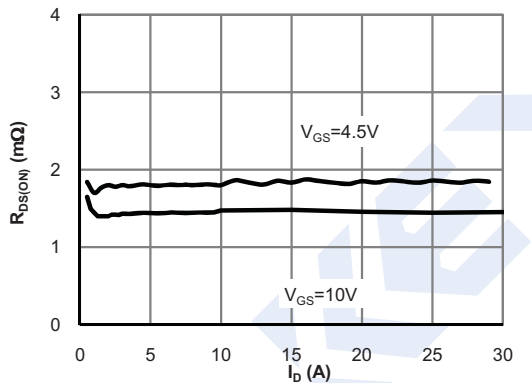


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

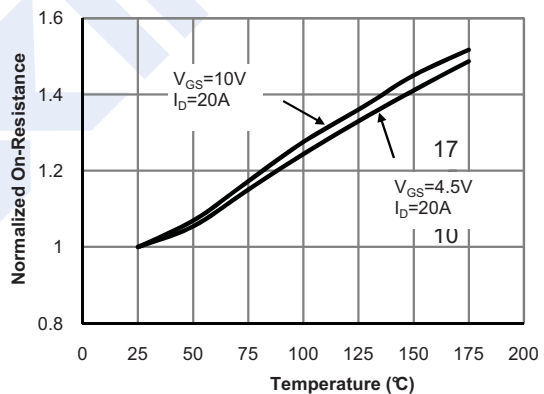


Figure 4: On-Resistance vs. Junction Temperature (Note E)

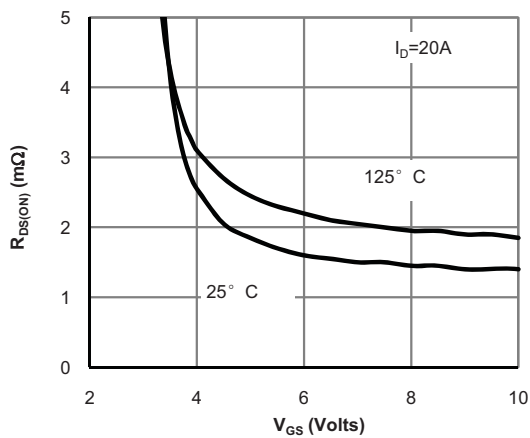


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

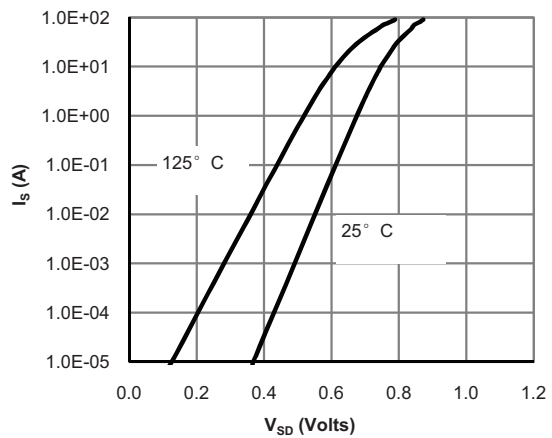
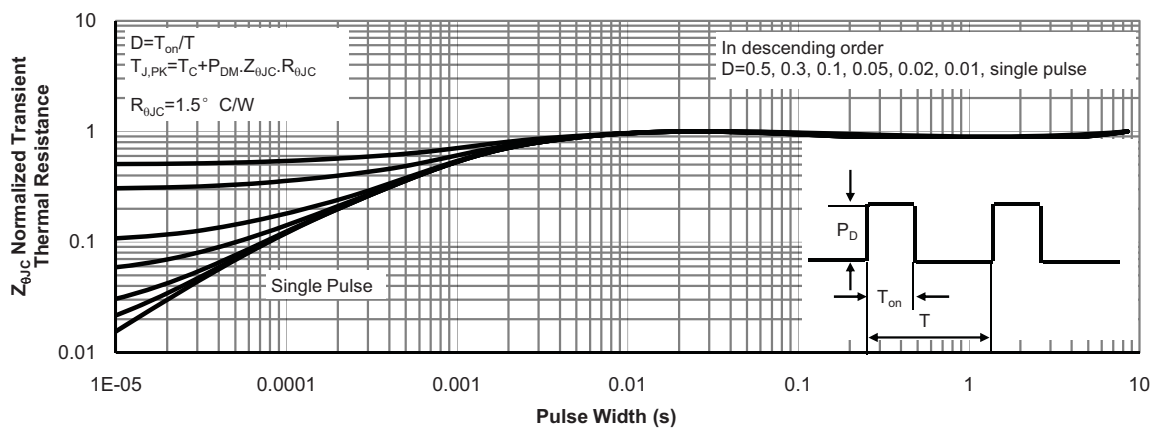
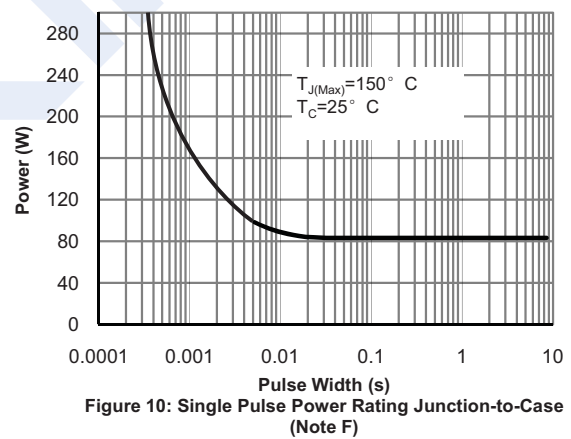
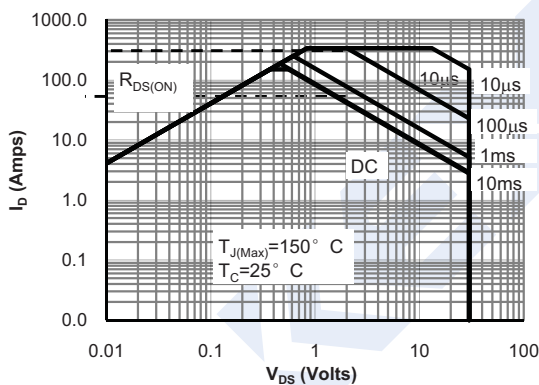
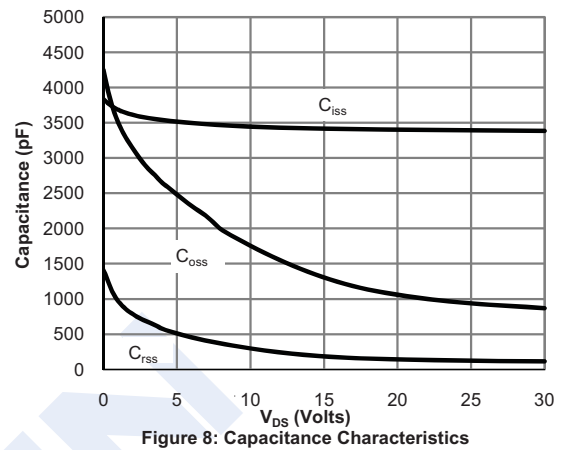
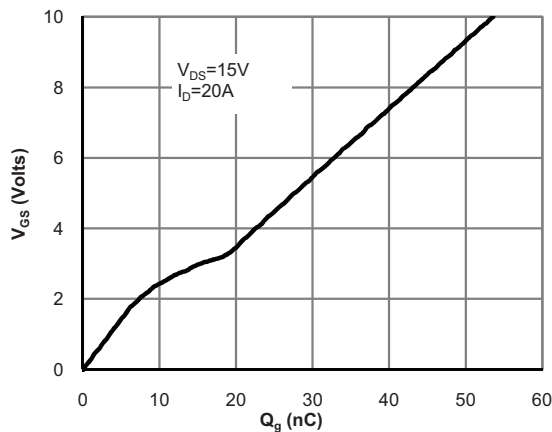


Figure 6: Body-Diode Characteristics (Note E)

# N-Channel MOSFET

## AON6512 (KON6512)

### Typical Characteristics



# N-Channel MOSFET

## AON6512 (KON6512)

■ Typical Characteristics

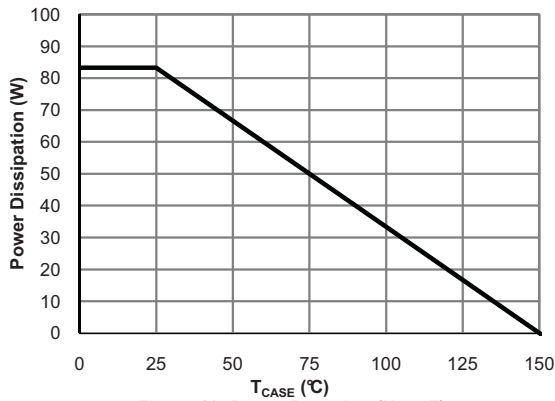


Figure 12: Power De-rating (Note F)

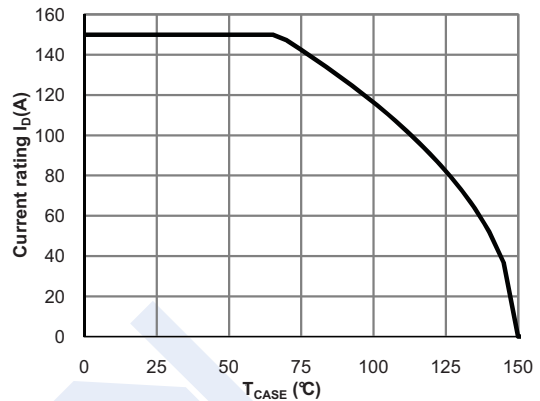


Figure 13: Current De-rating (Note F)

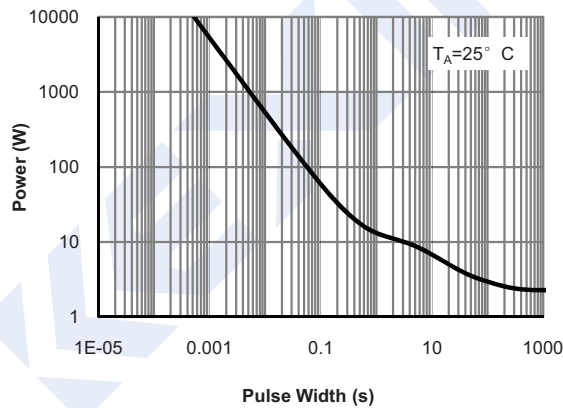


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

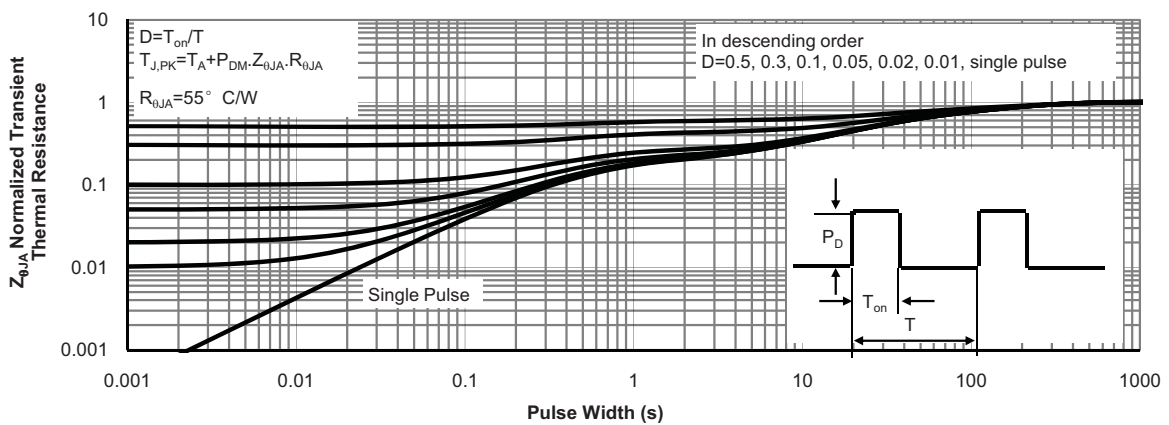


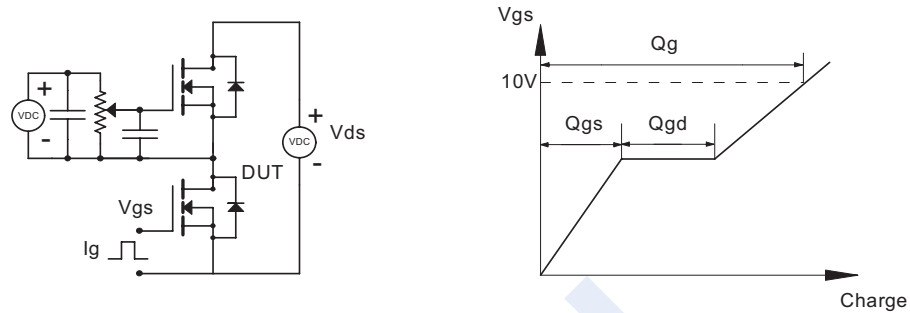
Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

## N-Channel MOSFET

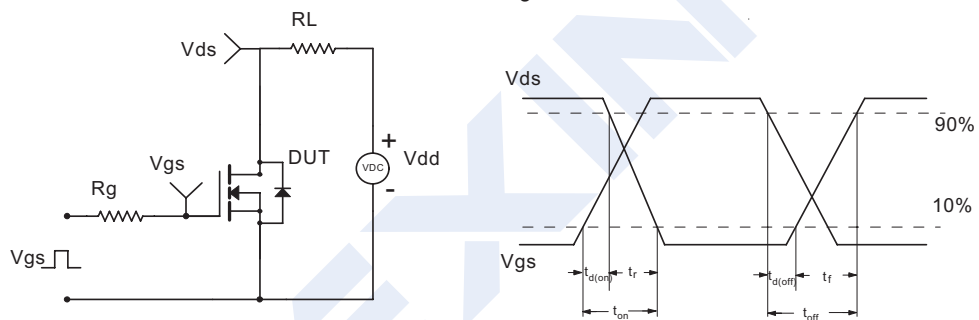
### AON6512 (KON6512)

■ Typical Characteristics

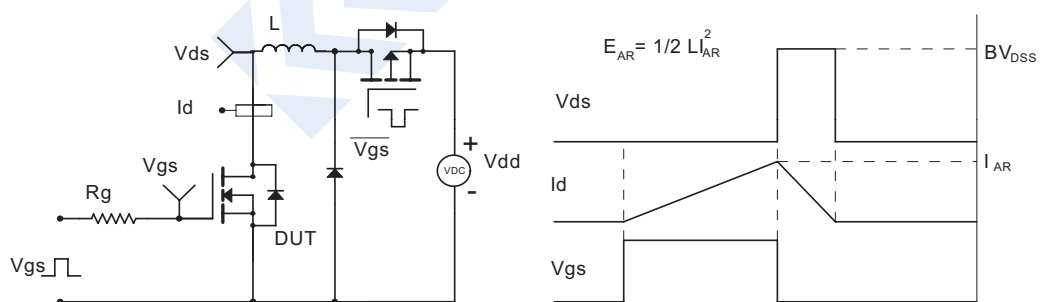
Gate Charge Test Circuit & Waveform



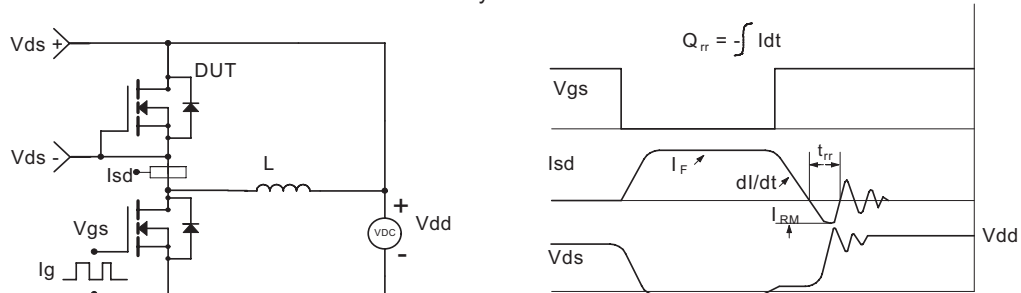
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



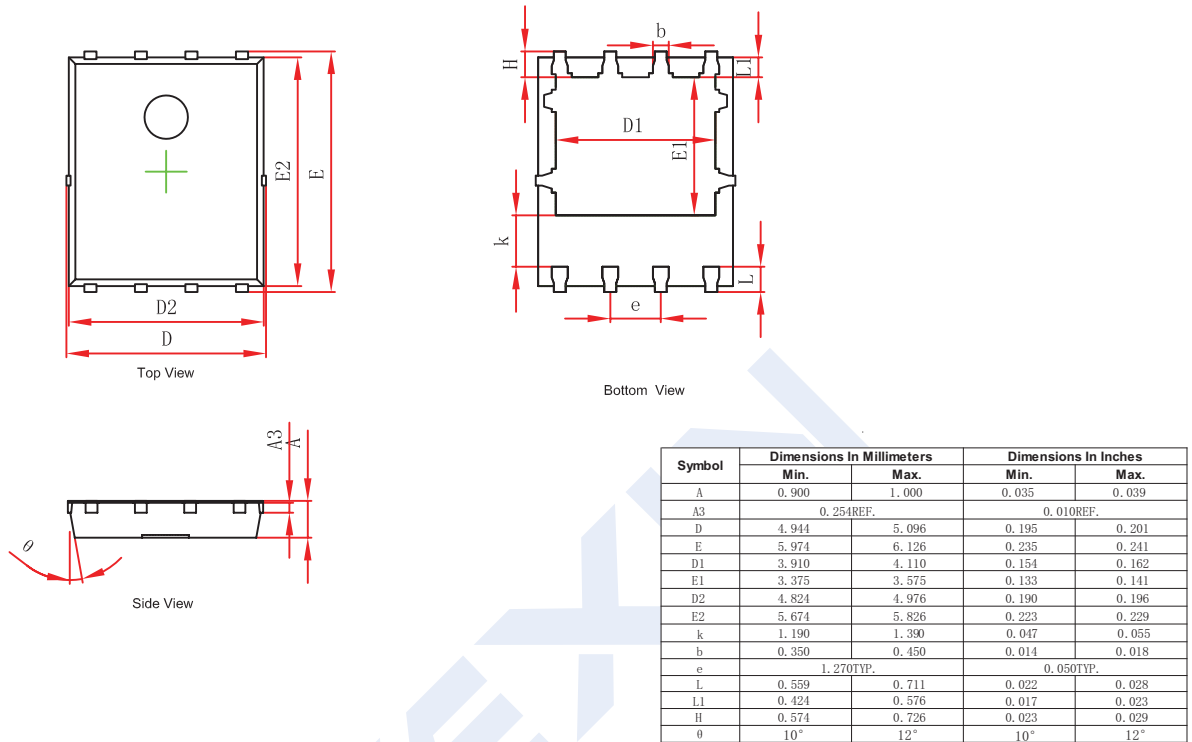
Diode Recovery Test Circuit & Waveforms



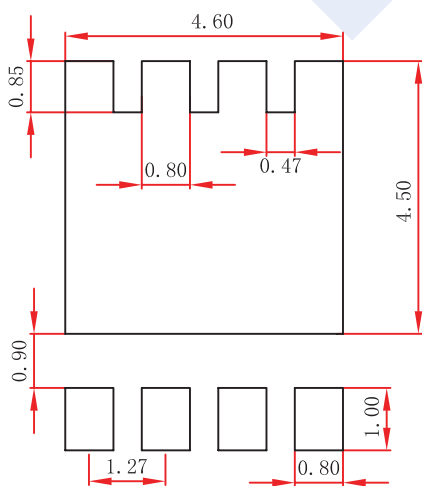
## N-Channel MOSFET

### AON6512 (KON6512)

#### DFN5x6-8(PDFNWB5x6-8L) Package Outline Dimensions



#### DFN5x6-8(PDFNWB5x6-8L) Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05$ mm.
  3. The pad layout is for reference purposes only.