



## New Product Announcement

### ZXMS6005N8 IntelliFET

# 60V N-Channel Low-Side IntelliFET in SO-8 Offers System Protection with Improved Performance

Diodes Incorporated announces the introduction of the ZXMS6005N8 Low-Side IntelliFET, a single-channel, self-protected MOSFET, housed in the industry standard SO-8 package, to enhance the 60V N-channel, IntelliFET family.

Unlike a standard discrete MOSFET switch, ZXMS6005N8 integrates both the MOSFET and smart circuitry (providing functions such as overvoltage, overtemperature, overcurrent, short-circuit and ESD protection) into a single thermally-efficient package. The device is designed to protect itself as well as the load, and operates in harsh environments where standard MOSFETs are not rugged enough. Additionally, ZXMS6005N8 can be used as a general purpose switch or as a power switch driven from either 3.3V or 5V microcontrollers in 12V and 24V DC applications.

ZXMS6005N8 is ideally suited for driving various resistive, inductive, and capacitive loads in switching applications. In addition, the device can replace a variety of electromechanical relays and discrete circuitry. As a result, circuit complexity is reduced, savings on component count, PCB size, and overall system costs can be achieved.



## The Diodes Advantage

### Low On-State Resistance

The low drain-source on-state resistance ( $R_{DS(ON\_MAX)} = 200m\Omega @ V_{IN} = 5V$ ) minimizes conduction losses and improves power efficiency.

### Overvoltage Protection and ESD Protection

The active clamping circuit protects the embedded MOSFET and the external load for voltages  $>65V$  in typical condition. In addition, the input clamping diode protects the internal gate of the MOSFET and the protection circuitry to 4kV.

### Overcurrent Protection and Short-Circuit Protection

The overcurrent protection circuit reduces gate drive which limits the MOSFET current when  $V_{DS}$  is large enough to cause excess power dissipation. Short-circuit protection is activated when  $V_{DS}$  reaches 36V.

### Overtemperature Protection

The overtemperature protection circuit turns off the internal gate to interrupt the power dissipation when the device reaches a temperature of  $T_{JT\_TYP} = 175^\circ C$ . The internal gate will be turned back ON when the temperature drops by  $10^\circ C$  approximately.

## Circuit Functions

- Drive Resistive, Inductive, Capacitive Loads
- Device and Load Protection
- Low-Side Switch

## Target Applications

- GPS System
- HVAC
- Solenoid, Relay, Lamp Driver
- Distributed I/O Modules
- Alarm System
- Remote I/O Controller



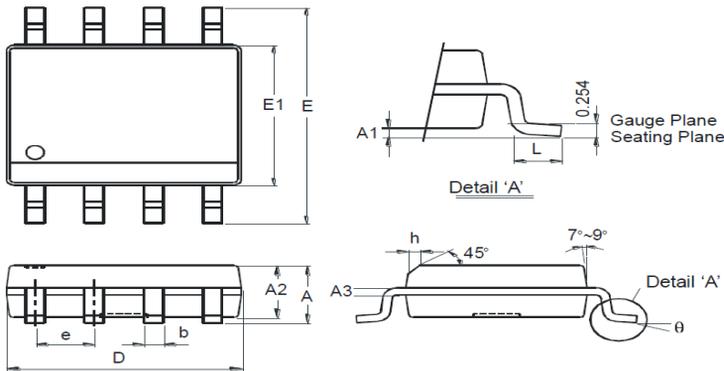
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IntelliFET

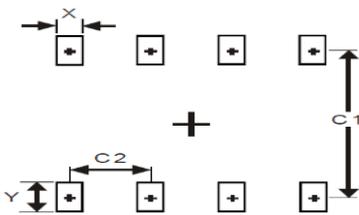
## Product Portfolio

Part No.	Channel	Polarity	Maximum $V_{DS}$ (V)	Minimum $I_D$ (A) @ $V_{IN}=5V$	$P_D$ (W)	Maximum $R_{DS(ON)}$ (m $\Omega$ ) @		Minimum $V_{DS(AZ)}$ (V)	Maximum $V_{DS(SC)}$ (V)	$E_{AS}$ (mJ)	Package
						$V_{IN}=3V$	$V_{IN}=5V$				
ZXMS6005N8	Single	N	60	2.0	1.65	250	200	60	36	490	SO-8

## Package Outline Dimensions & Suggested Pad Layout



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
$\theta$	0°	8°
All Dimensions in mm.		



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

## Cross Reference

Diodes Device	Competitors	Close Cross Reference
ZXMS6005N8	ST, Irf	VNS1NV04P-E, AUIPS1052G

Deviations may exist between the specifications of the Diodes devices and the specifications of the competitor devices listed above. The customer is encouraged to carefully review the Diodes Inc. and competitor datasheets to verify the suitability of the Diodes device as a cross for any given competitor product. It is solely the responsibility of the customer to determine whether the Diodes device is suitable for any given application.