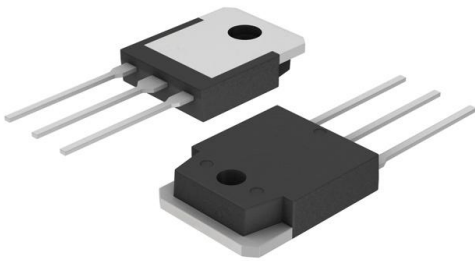


# FDA032N08 Datasheet

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DiGi Electronics Part Number	FDA032N08-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	FDA032N08
Description	MOSFET N-CH 75V 120A TO3PN
Detailed Description	N-Channel 75 V 120A (Tc) 375W (Tc) Through Hole TO-3PN



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

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## Purchase and inquiry

Manufacturer Product Number:

FDA032N08

Series:

PowerTrench®

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

75 V

Drive Voltage (Max Rds On, Min Rds On):

10V

Vgs(th) (Max) @ Id:

4.5V @ 250µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

TO-3PN

Base Product Number:

FDA032

Manufacturer:

onsemi

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

120A (Tc)

Rds On (Max) @ Id, Vgs:

3.2mOhm @ 75A, 10V

Gate Charge (Qg) (Max) @ Vgs:

220 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

15160 pF @ 25 V

Power Dissipation (Max):

375W (Tc)

Mounting Type:

Through Hole

Package / Case:

TO-3P-3, SC-65-3

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

Not Applicable

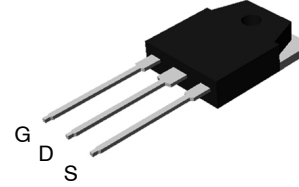
ECCN:

EAR99

# MOSFET – N-Channel, POWERTRENCH®

**75 V, 235 A, 3.2 mΩ**

## FDA032N08


**TO-3P-3LD / EIAJ SC-65, ISOLATED  
CASE 340BZ**

### Description

This N-Channel MOSFET is produced using **onsemi**'s advanced POWERTRENCH process that has been tailored to minimize the on-state resistance while maintaining superior switching performance.

### Features

- $R_{DS(on)} = 2.5 \text{ m}\Omega$  (Typ.) @  $V_{GS} = 10 \text{ V}$ ,  $I_D = 75 \text{ A}$
- Fast Switching Speed
- Low Gate Charge
- High Performance Trench Technology for Extremely Low  $R_{DS(on)}$
- High Power and Current Handling Capability
- RoHS Compliant

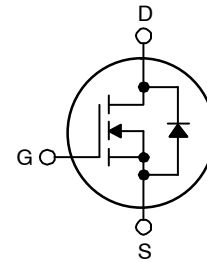
### Applications

- Synchronous Rectification for ATX / Server / Telecom PSU
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies

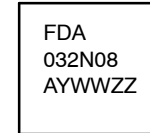
### MOSFET MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{DSS}$	Drain to Source Voltage	75	V
$V_{GSS}$	Gate to Source Voltage	$\pm 20$	V
$I_D$	Drain Current		A
	Continuous ( $T_C = 25^\circ\text{C}$ , Silicon Limited)	235	
	Continuous ( $T_C = 100^\circ\text{C}$ , Silicon Limited)	165	
	Continuous ( $T_C = 25^\circ\text{C}$ , Package Limited)	120	
$I_{DM}$	Drain Current – Pulsed (Note 1)	940	A
$E_{AS}$	Single Pulsed Avalanche Energy (Note 2)	1995	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
$P_D$	Power Dissipation ( $T_C = 25^\circ\text{C}$ ) – Derate above $25^\circ\text{C}$	375	W
		2.5	W/ $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +175	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds	300	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



### MARKING DIAGRAM



FDA032N08 = Specific Device Code  
A = Assembly Location  
YWW = Date Code (Year and Week)  
ZZ = Assembly Lot

### ORDERING INFORMATION

Device	Package	Shipping
FDA032N08	TO-3P-3L (Pb-Free)	450 Units / Tube

## FDA032N08

## THERMAL CHARACTERISTICS

Symbol	Parameter	FDA032N08	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max	0.4	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Max	40	$^{\circ}\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$ , unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTIC</b>						
$BV_{DSS}$	Drain to Source Breakdown Voltage	$I_D = 250 \mu\text{A}$ , $V_{GS} = 0 \text{ V}$ , $T_C = 25^{\circ}\text{C}$	75	-	-	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250 \mu\text{A}$ , Referenced to $25^{\circ}\text{C}$	-	0.05	-	$\text{V}/^{\circ}\text{C}$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 75 \text{ V}$ , $V_{GS} = 0 \text{ V}$	-	-	1	$\mu\text{A}$
		$V_{DS} = 75 \text{ V}$ , $T_C = 150^{\circ}\text{C}$	-	-	10	
$I_{GSS}$	Gate to Body Leakage Current	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	-	-	$\pm 100$	nA

## ON CHARACTERISTICS

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$ , $I_D = 250 \mu\text{A}$	2.5	3.5	4.5	V
$R_{DS(on)}$	Static Drain to Source On-Resistance	$V_{GS} = 10 \text{ V}$ , $I_D = 75 \text{ A}$	-	2.5	3.2	$\text{m}\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS} = 20 \text{ V}$ , $I_D = 75 \text{ A}$	-	180	-	S

## DYNAMIC CHARACTERISTICS

$C_{iss}$	Input Capacitance	$V_{DS} = 25 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	-	11400	15160	pF
$C_{oss}$	Output Capacitance		-	1360	1810	pF
$C_{rss}$	Reverse Transfer Capacitance		-	595	800	pF
$Q_g(TOT)$	Total Gate Charge at 10 V	$V_{DS} = 60 \text{ V}$ , $I_D = 75 \text{ A}$ , $V_{GS} = 10 \text{ V}$ (Note 4)	-	169	220	nC
$Q_{gs}$	Gate to Source Gate Charge		-	60	-	nC
$Q_{gd}$	Gate to Drain "Miller" Charge		-	47	-	nC

## SWITCHING CHARACTERISTICS

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 37.5 \text{ V}$ , $I_D = 75 \text{ A}$ , $R_G = 25 \Omega$ , $V_{GS} = 10 \text{ V}$ (Note 4)	-	230	470	ns
$t_r$	Turn-On Rise Time		-	191	392	ns
$t_{d(off)}$	Turn-Off Delay Time		-	335	680	ns
$t_f$	Turn-Off Fall Time		-	121	252	ns

## DRAIN-SOURCE DIODE CHARACTERISTICS

$I_S$	Maximum Continuous Drain to Source Diode Forward Current	-	-	235	A	
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current	-	-	940	A	
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0 \text{ V}$ , $I_{SD} = 75 \text{ A}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0 \text{ V}$ , $I_{SD} = 75 \text{ A}$ , $di_F/dt = 100 \text{ A}/\mu\text{s}$	-	53	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	77	-	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $L = 0.71 \text{ mH}$ ,  $I_{AS} = 75 \text{ A}$ ,  $V_{DD} = 50 \text{ V}$ ,  $R_G = 25 \Omega$ , Starting  $T_J = 25^{\circ}\text{C}$ .
3.  $I_{SD} \leq 75 \text{ A}$ ,  $di/dt \leq 200 \text{ A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^{\circ}\text{C}$ .
4. Essentially independent of operating temperature typical characteristics.

# FDA032N08

## TYPICAL PERFORMANCE CHARACTERISTICS

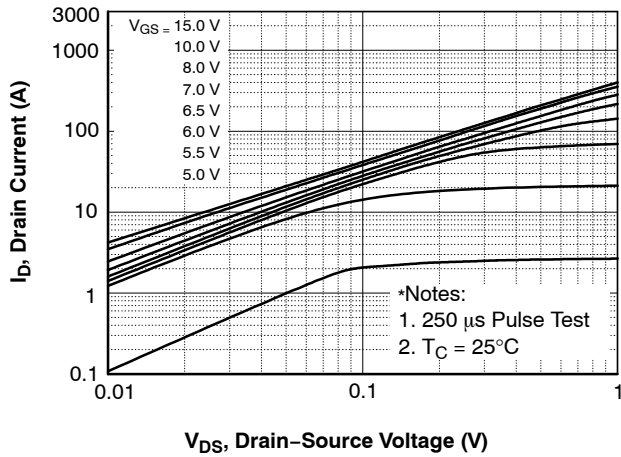


Figure 1. On-Region Characteristics

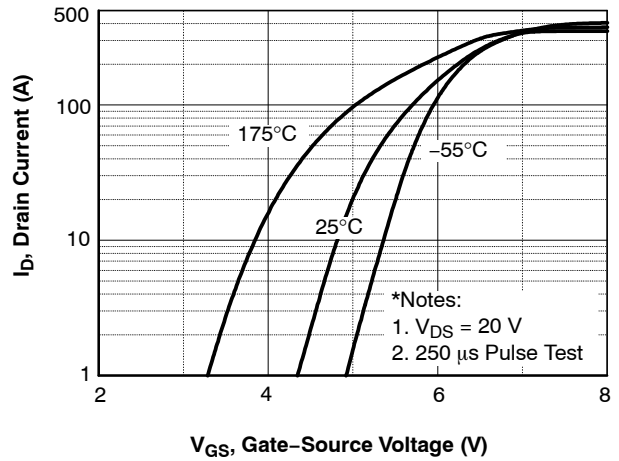


Figure 2. Transfer Characteristics

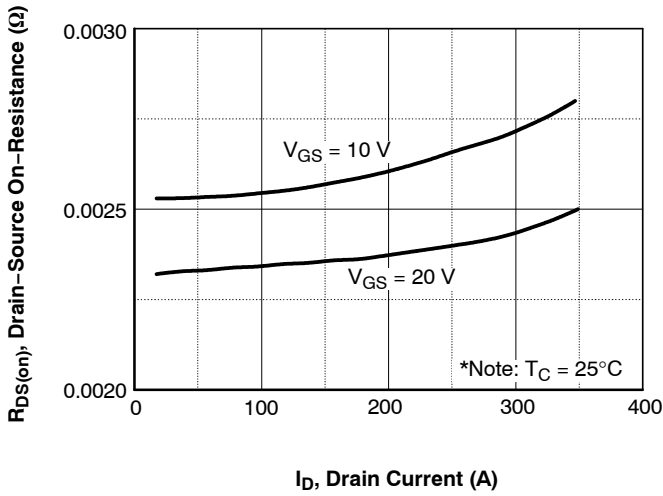


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

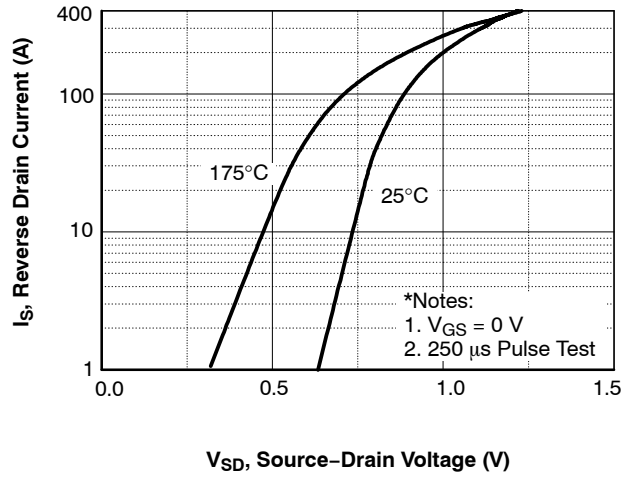


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

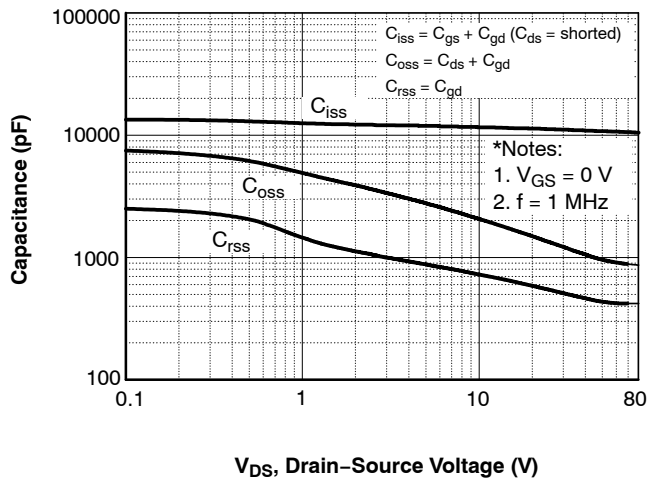


Figure 5. Capacitance Characteristics

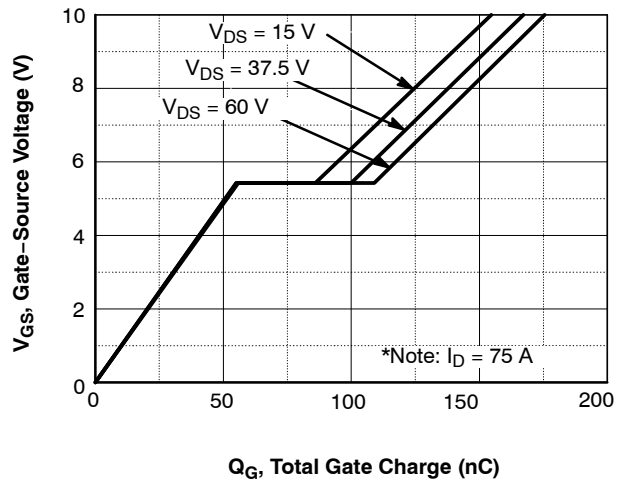
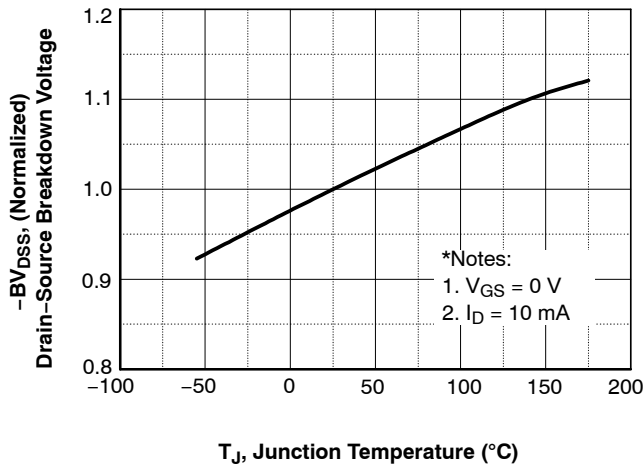


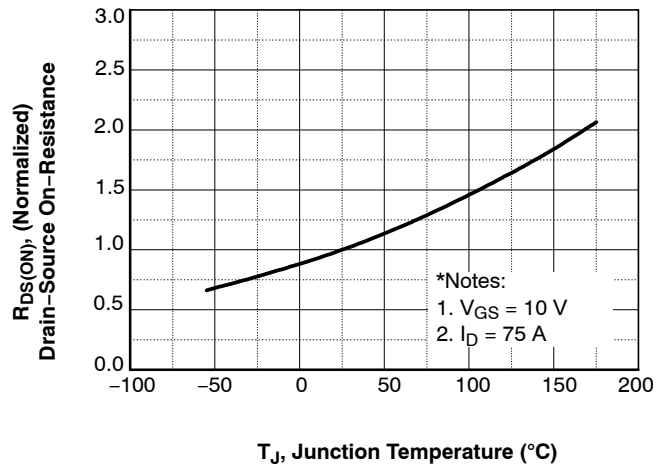
Figure 6. Gate Charge Characteristics

# FDA032N08

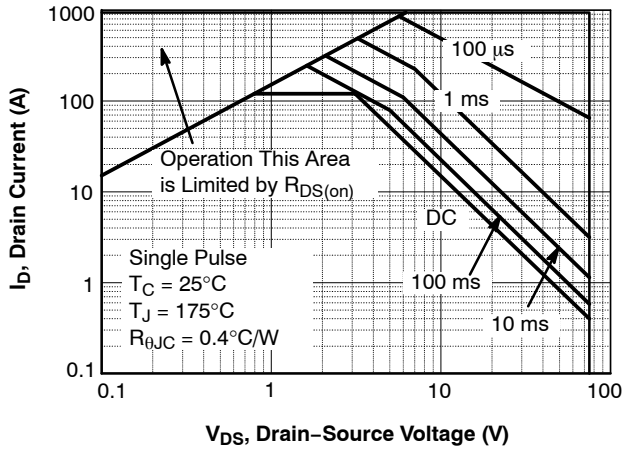
## TYPICAL PERFORMANCE CHARACTERISTICS (continued)



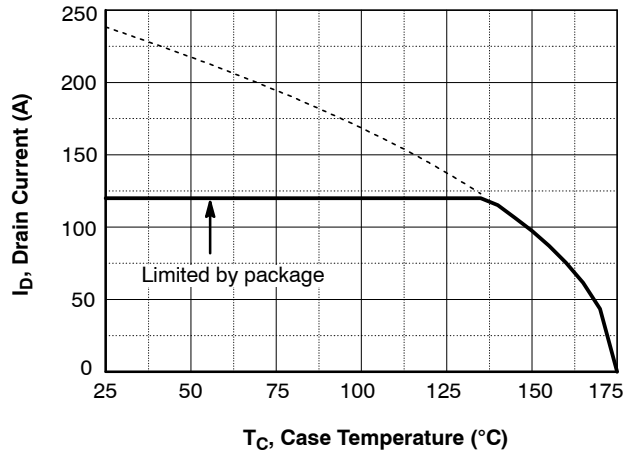
**Figure 7. Breakdown Voltage Variation vs. Temperature**



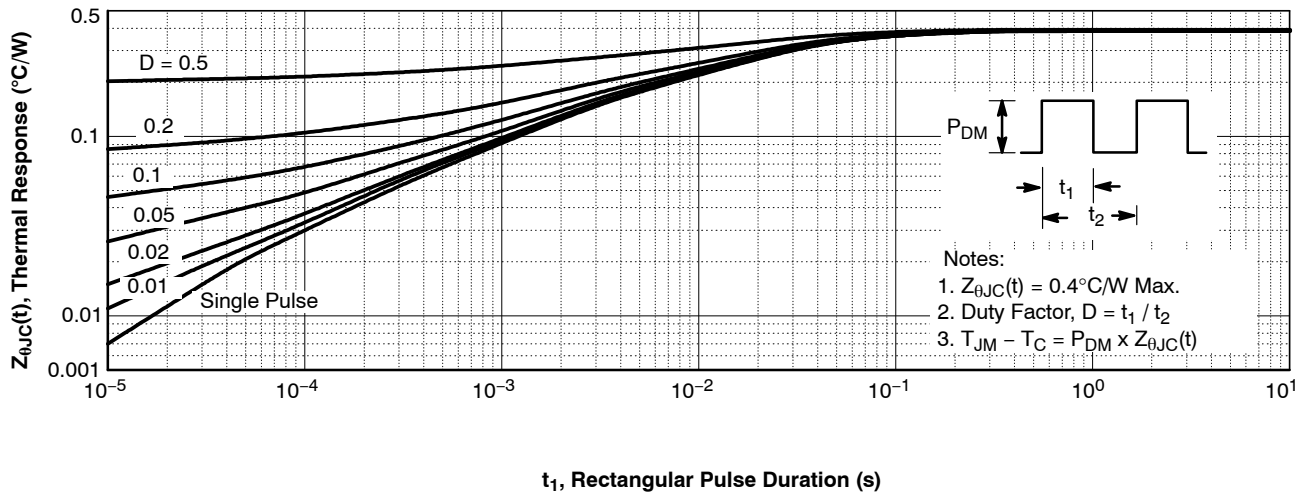
**Figure 8. On-Resistance Variation vs. Temperature**



**Figure 9. Maximum Safe Operating Area**

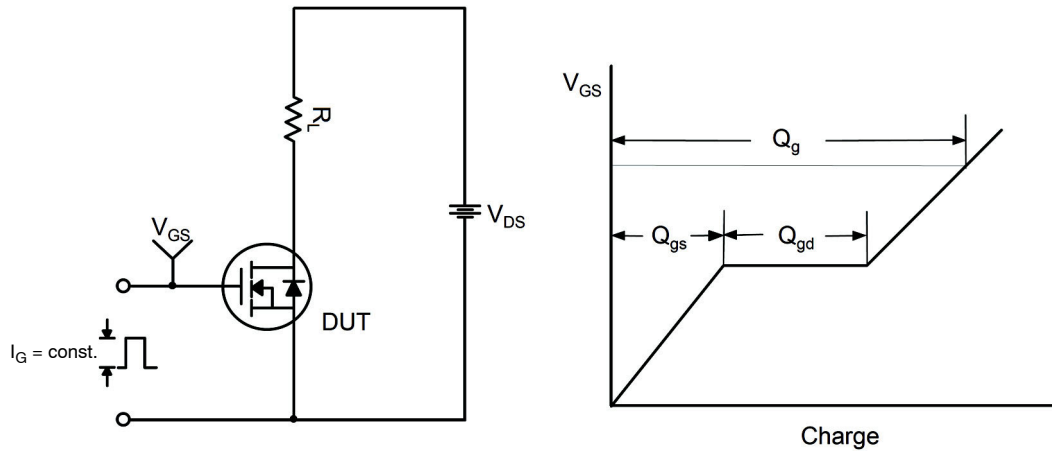


**Figure 10. Maximum Drain Current vs. Case Temperature**

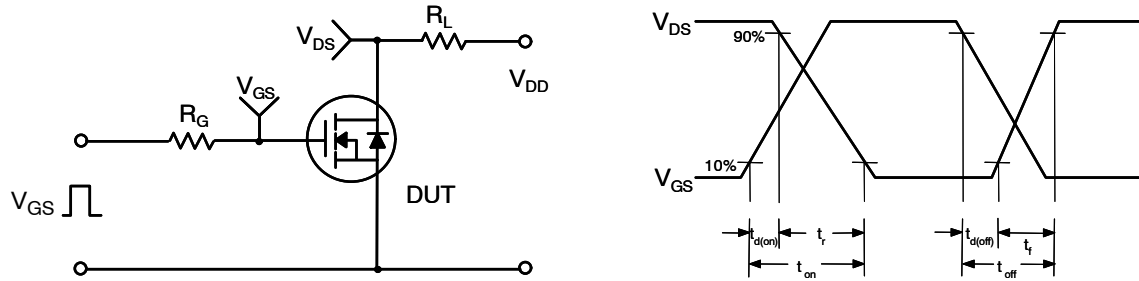


**Figure 11. Transient Thermal Response Curve**

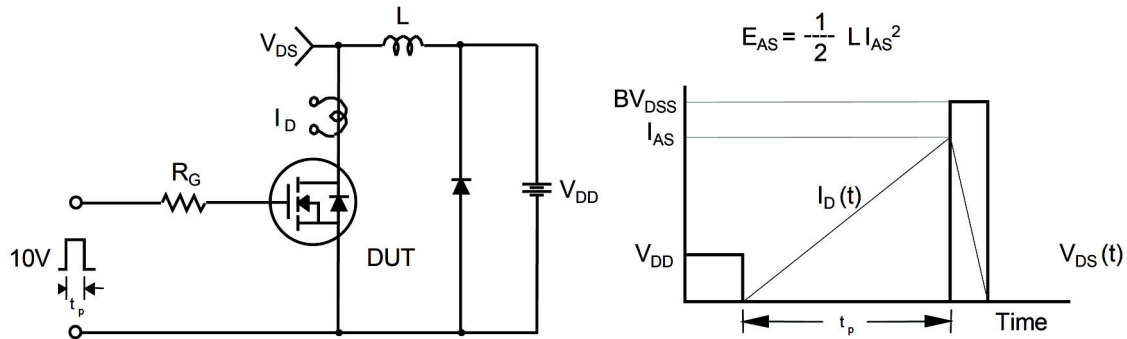
**FDA032N08**



**Figure 12. Gate Charge Test Circuit & Waveform**

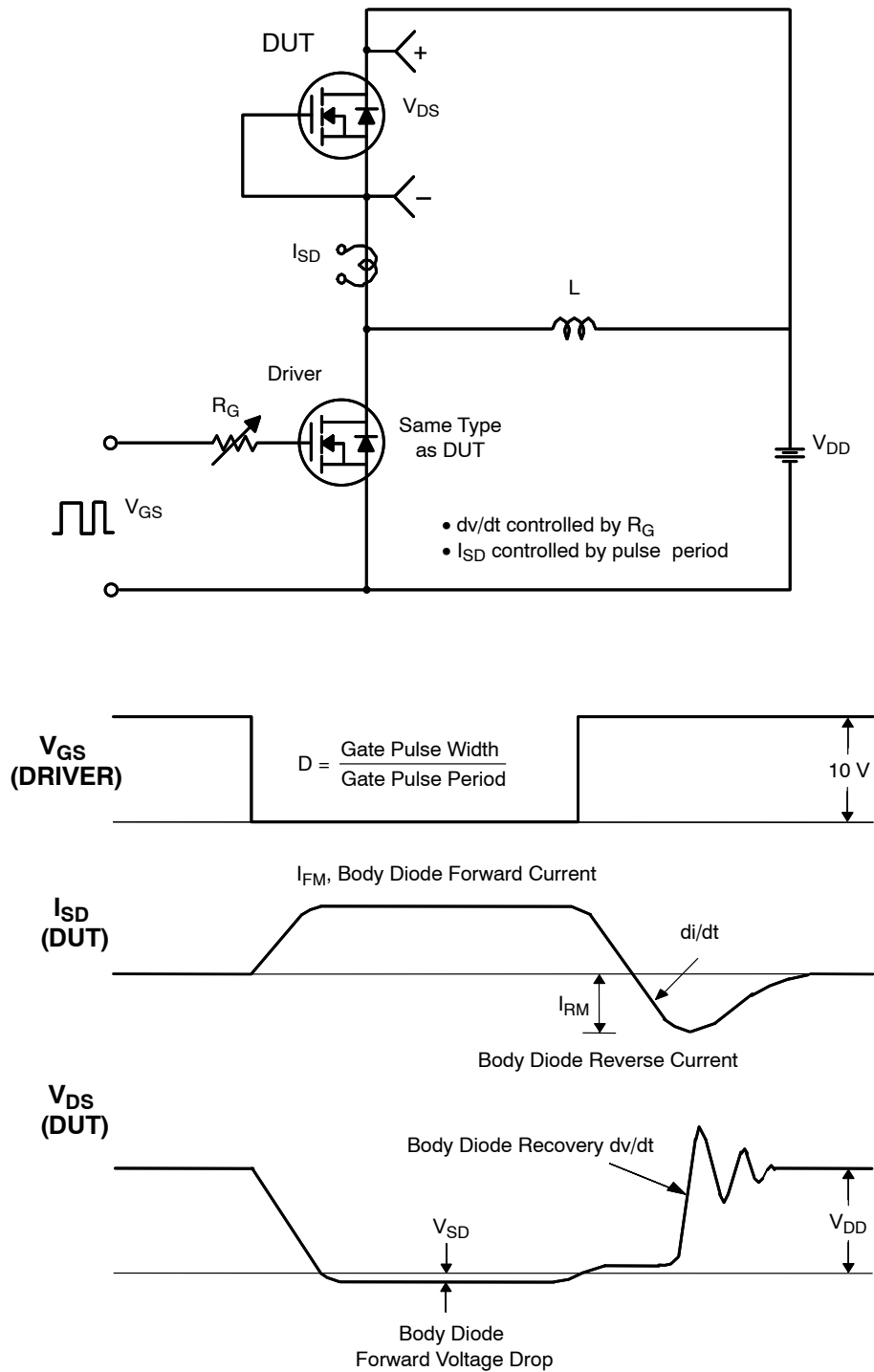


**Figure 13. Resistive Switching Test Circuit & Waveforms**



**Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms**

**FDA032N08**



**Figure 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms**

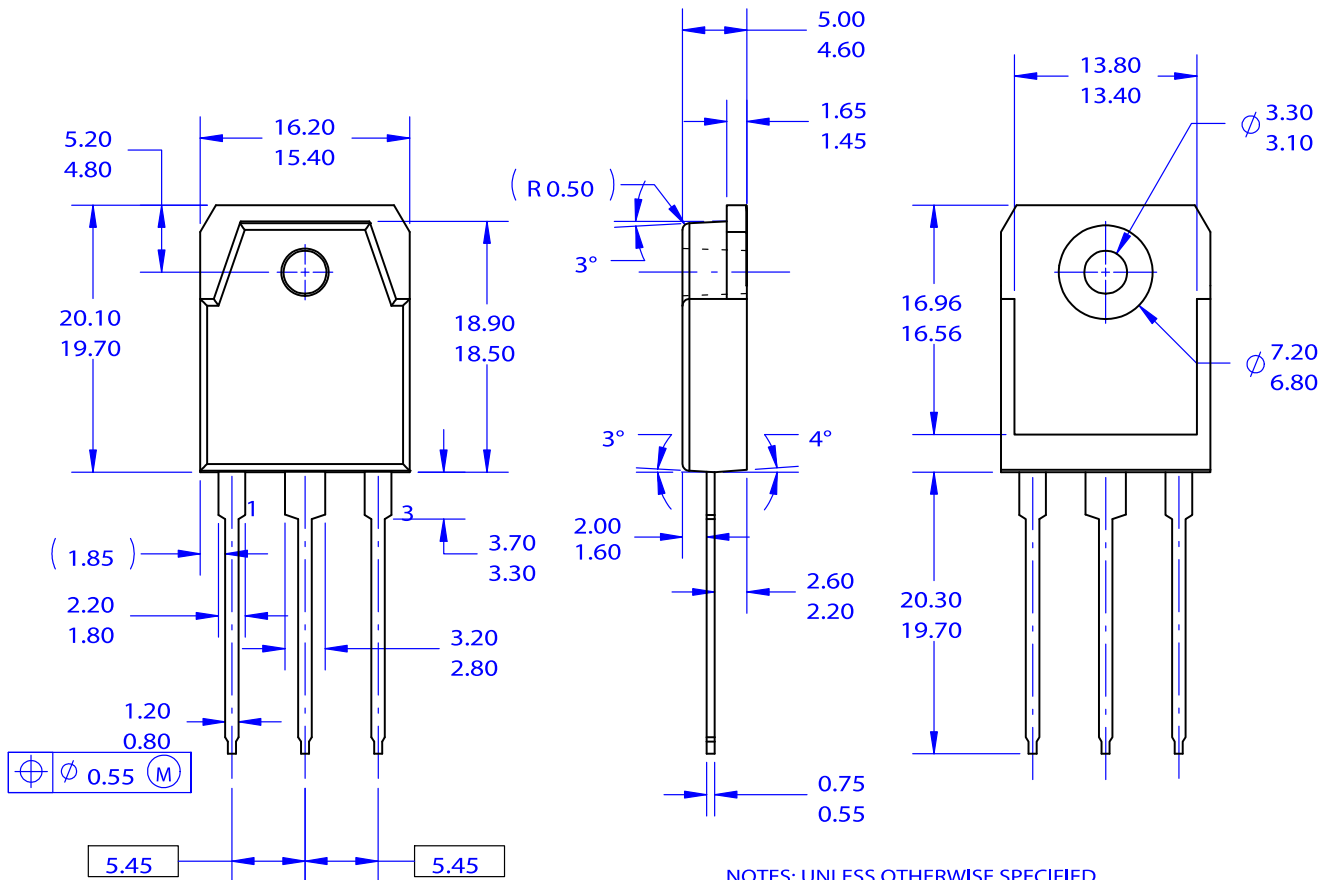




**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**

**TO-3P-3LD / EIAJ SC-65, ISOLATED  
CASE 340BZ  
ISSUE O**

DATE 31 OCT 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) THIS PACKAGE CONFORMS TO EIAJ SC-65 PACKAGING STANDARD.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSION AND TOLERANCING PER ASME14.5-2009.
- D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

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