

MOSFET – Power, N-Channel, Ultrafet

100 V, 56 A, 25 mΩ

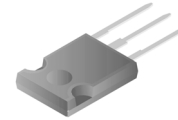
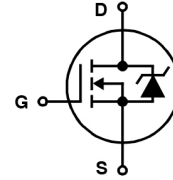
HUF75639G3, HUF75639P3, HUF75639S3S, HUF75639S3

These N-Channel power MOSFETs are manufactured using the innovative Ultrafet process. This advanced process technology achieves the lowest possible on-resistance per silicon area, resulting in outstanding performance. This device is capable of withstanding high energy in the avalanche mode and the diode exhibits very low reverse recovery time and stored charge. It was designed for use in applications where power efficiency is important, such as switching regulators, switching converters, motor drivers, relay drivers, low-voltage bus switches, and power management in portable and battery-operated products.

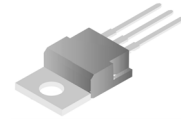
Formerly developmental type TA75639.

Features

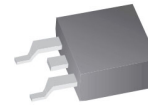
- 56 A, 100 V
- Simulation Models
 - ◆ Temperature Compensated PSPICE® and SABER™ Electrical Models
 - ◆ Spice and Saber Thermal Impedance Models
 - ◆ www.onsemi.com
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- Related Literature
 - ◆ TB334, “Guidelines for Soldering Surface Mount Components to PC Boards”
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant



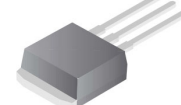
TO-247-3LD
CASE 340CK



TO-220-3LD
CASE 340AT

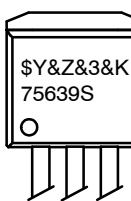
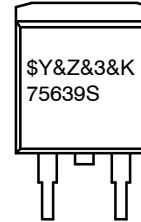
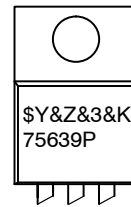
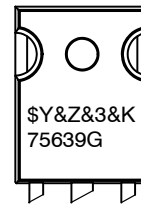


D2PAK-3
CASE 418AJ



I2PAK
CASE 418AV

MARKING DIAGRAMS



- | | |
|--------|---------------------------------|
| &Y | = onsemi Logo |
| &Z | = Assembly Plant Code |
| &3 | = 3-Digit Date Code |
| &K | = 2-Digit Lot Traceability Code |
| 75639x | = Specific Device Code |
| x | = G/P/S |

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

HUF75639G3, HUF75639P3, HUF75639S3S, HUF75639S3

ORDERING INFORMATION

PART NUMBER	PACKAGE	BRAND
HUF75639G3	TO-247	75639G
HUF75639P3	TO-220AB	75639P
HUF75639S3ST	TO-263AB	75639S
HUF75639S3	TO-262AA	75639S

PACKAGING

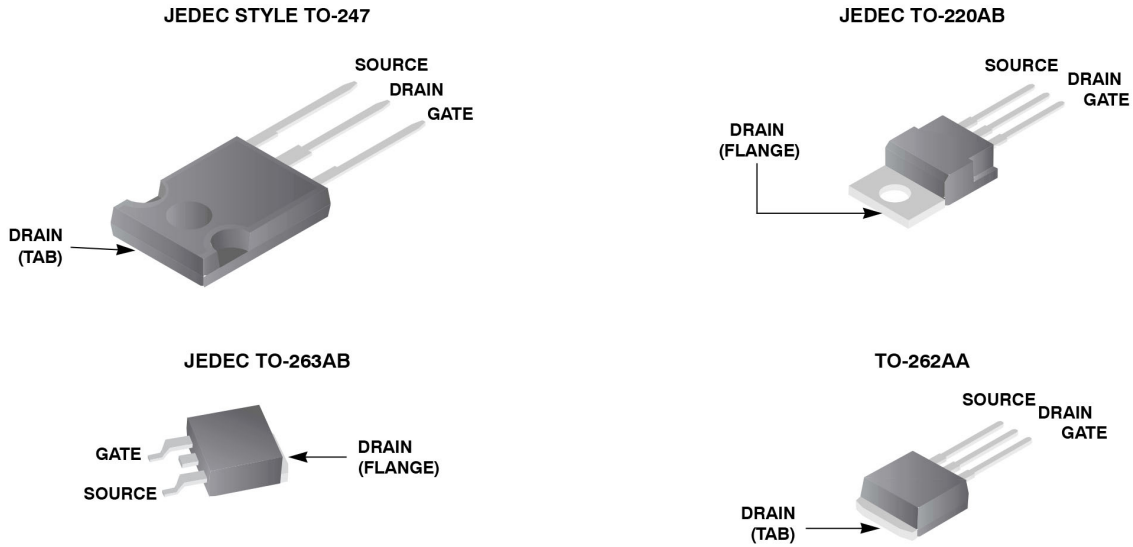


Figure 1.

ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ\text{C}$ unless otherwise specified

Description	Symbol	Ratings	Units
Drain to Source Voltage (Note 1)	V_{DSS}	100 V	V
Drain to Gate Voltage ($R_{GS} = 20\text{ k}\Omega$) (Note 1)	V_{DGR}	100 V	V
Gate to Source Voltage	V_{GS}	$\pm 20\text{ V}$	V
Drain Current Continuous (Figure 2) Pulsed Drain Current	I_D I_{DM}	56 Figure 4	A
Pulsed Avalanche Rating	E_{AS}	Figures 6, 14, 15	
Power Dissipation Derate Above 25°C	P_D	200 1.35	W W/ $^\circ\text{C}$
Operating and Storage Temperature	T_J, T_{STG}	$-55\text{ to }175^\circ\text{C}$	$^\circ\text{C}$
Maximum Temperature for Soldering Leads at 0.063in (1.6 mm) from Case for 10s Package Body for 10 s, See Techbrief 334	T_L T_{pkg}	300 260	$^\circ\text{C}$

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.

1. $T_J = 25^\circ\text{C}$ to 150°C .

HUF75639G3, HUF75639P3, HUF75639S3S, HUF75639S3

ELECTRICAL SPECIFICATION $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
--------	-----------	-----------------	-----	-----	-----	-------

OFF STATE SPECIFICATIONS

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\text{ }\mu\text{A}$, $V_{GS} = 0\text{ V}$ (Figure 11)	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 95\text{ V}$, $V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 90\text{ V}$, $V_{GS} = 0\text{ V}$, $T_C = 150\text{ }^\circ\text{C}$	-	-	250	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA

ON STATE SPECIFICATIONS

$V_{GS(TH)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\text{ }\mu\text{A}$ (Figure 10)	2	-	4	V
$R_{DS(on)}$	Drain to Source On Resistance	$I_D = 56\text{ A}$, $V_{GS} = 10\text{ V}$ (Figure 9)	-	21	25	m Ω

THERMAL SPECIFICATIONS

$R_{\theta JC}$	Thermal Resistance Junction to Case	(Figure 3)	-	-	0.74	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	TO-247	-	-	30	$^\circ\text{C/W}$
		TO-220, TO-263, TO-262	-	-	62	$^\circ\text{C/W}$

SWITCHING SPECIFICATIONS ($V_{GS} = 10\text{ V}$)

t_{ON}	Turn-On Time	$V_{DD} = 50\text{ V}$, $I_D \cong 56\text{ A}$, $R_L = 0.89\text{ }\Omega$, $V_{GS} = 10\text{ V}$, $R_{GS} = 5.1\text{ }\Omega$	-	-	110	ns
$t_{d(ON)}$	Turn-On Delay Time		-	15	-	ns
t_r	Rise Time		-	60	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time		-	20	-	ns
t_f	Fall Time		-	25	-	ns
t_{OFF}	Turn-Off Time		-	-	70	ns

GATE CHARGE SPECIFICATIONS

$Q_g(TOT)$	Total Gate Charge	$V_{GS} = 0\text{ V to } 20\text{ V}$	$V_{DD} = 50\text{ V}$, $I_D \cong 56\text{ A}$, $R_L = 0.89\text{ }\Omega$, $I_{g(REF)} = 1.0\text{ mA}$ (Figure 13)	-	110	130	nC
$Q_g(10)$	Gate Charge at 10 V	$V_{GS} = 0\text{ V to } 10\text{ V}$		-	57	75	nC
$Q_g(TH)$	Threshold Gate Charge	$V_{GS} = 0\text{ V to } 2\text{ V}$		-	3.7	4.5	nC
Q_{gs}	Gate to Source Gate Charge			-	9.8	-	nC
Q_{gd}	Gate to Drain "Miller" Charge			-	24	-	nC

CAPACITANCE SPECIFICATIONS

C_{ISS}	Input Capacitance	$V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$ (Figure 12)	-	2000	-	pF
C_{OSS}	Output Capacitance		-	500	-	pF
C_{RSS}	Reverse Transfer Capacitance		-	65	-	pF

SOURCE TO DRAIN DIODE SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Source to Drain Diode Voltage	V_{SD}	$I_{SD} = 56\text{ A}$	-	-	1.25	V
Reverse Recovery Time	t_{rr}	$I_{SD} = 56\text{ A}$, $dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	-	110	ns
Reverse Recovered Charge	Q_{RR}	$I_{SD} = 56\text{ A}$, $dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	-	320	nC

TYPICAL PERFORMANCE CURVES

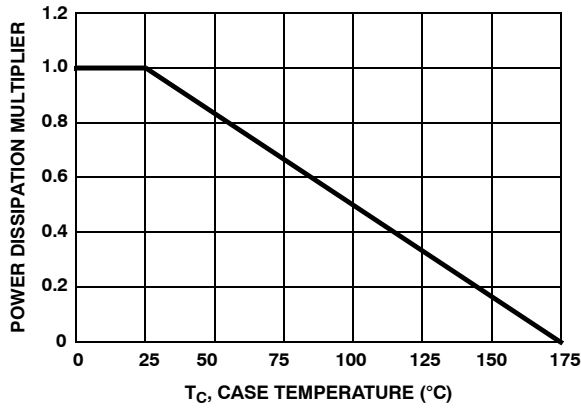


Figure 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

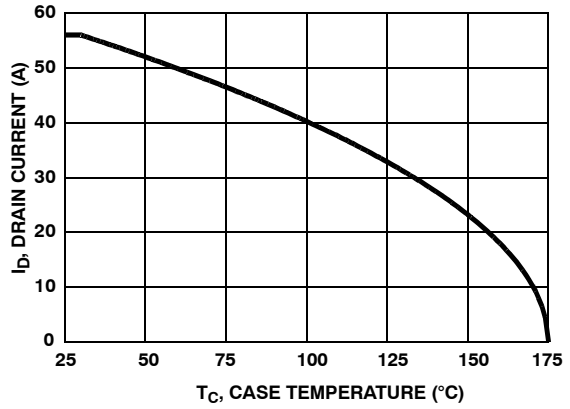


Figure 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

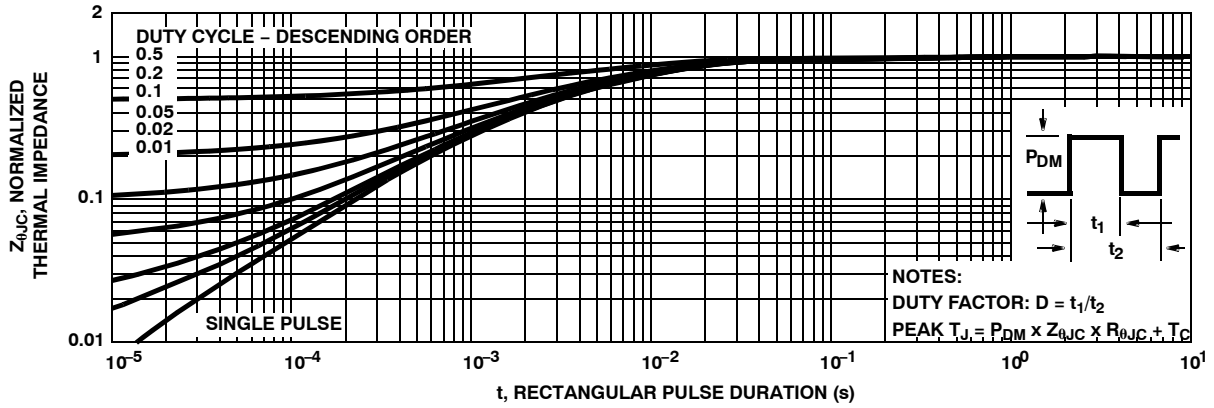


Figure 3. NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

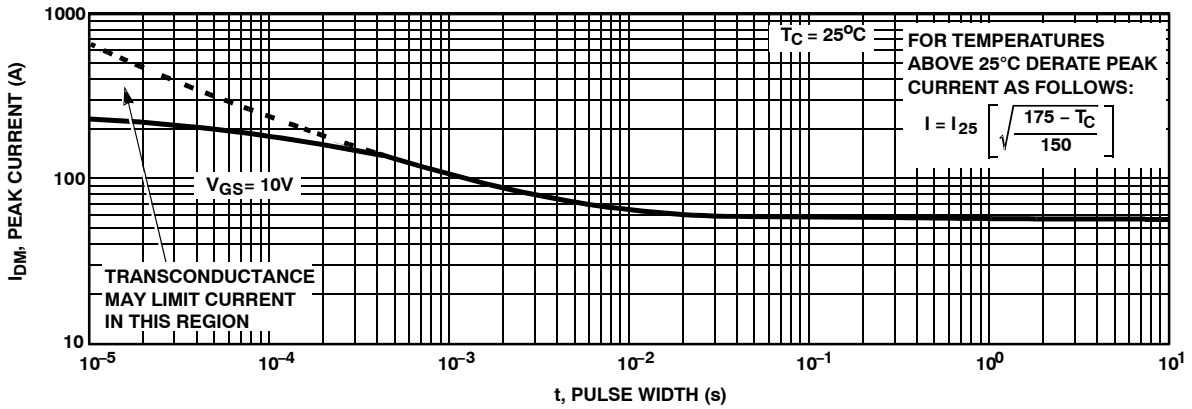


Figure 4. PEAK CURRENT CAPABILITY

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

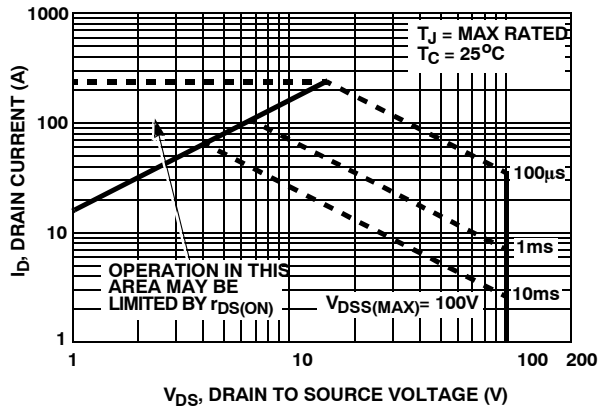


Figure 5. FORWARD BIAS SAFE OPERATING AREA

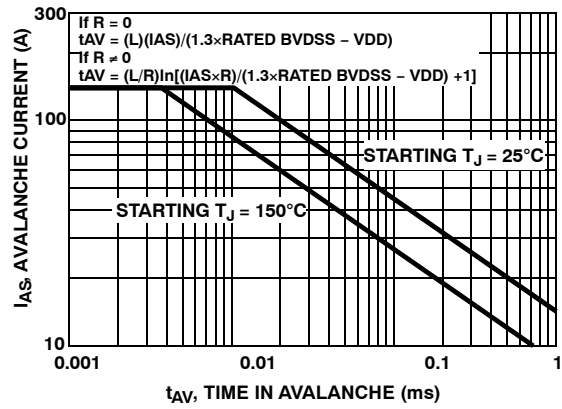


Figure 6. UNCLAMPED INDUCTIVE SWITCHING CAPABILITY

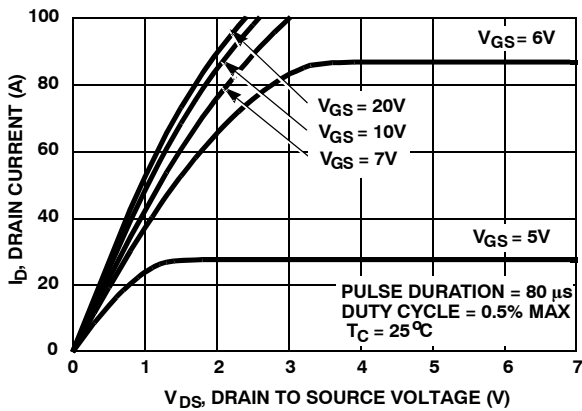


Figure 7. SATURATION CHARACTERISTICS

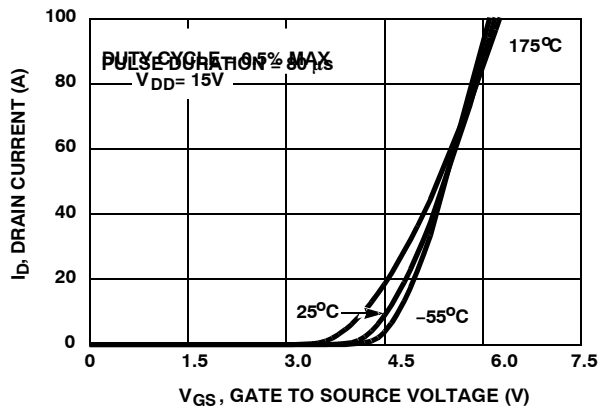


Figure 8. TRANSFER CHARACTERISTICS

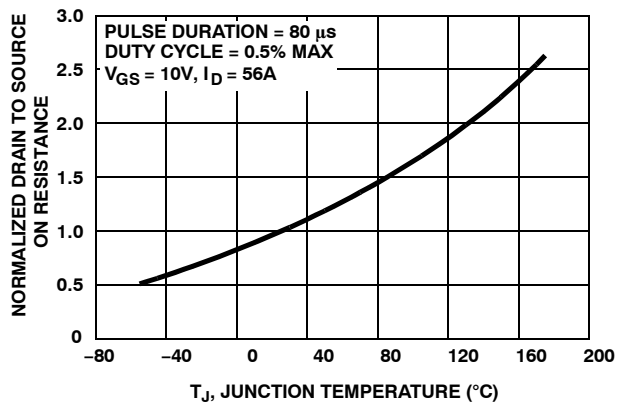


Figure 9. NORMALIZED DRAIN TO SOURCE ON RESISTANCE vs JUNCTION TEMPERATURE

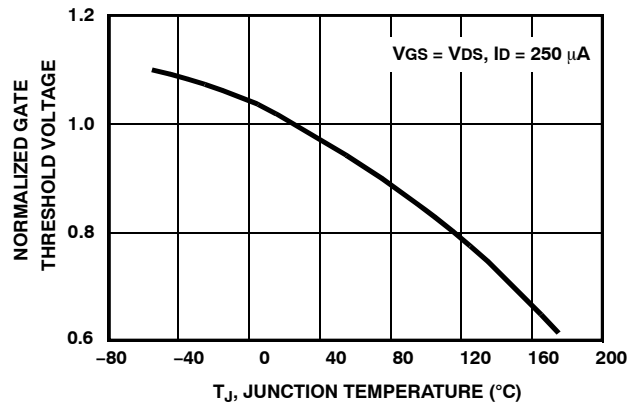


Figure 10. NORMALIZED GATE THRESHOLD VOLTAGE vs JUNCTION TEMPERATURE

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

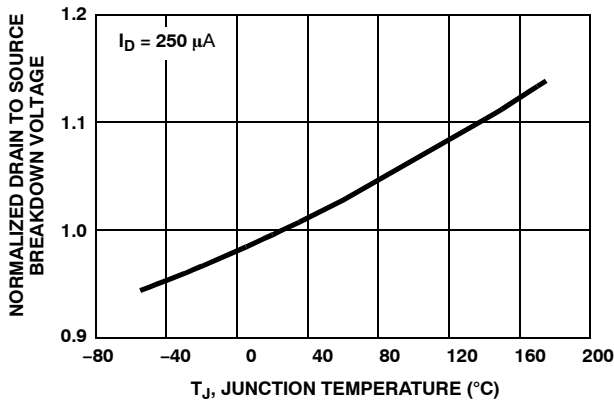


Figure 11. NORMALIZED DRAIN TO SOURCE BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

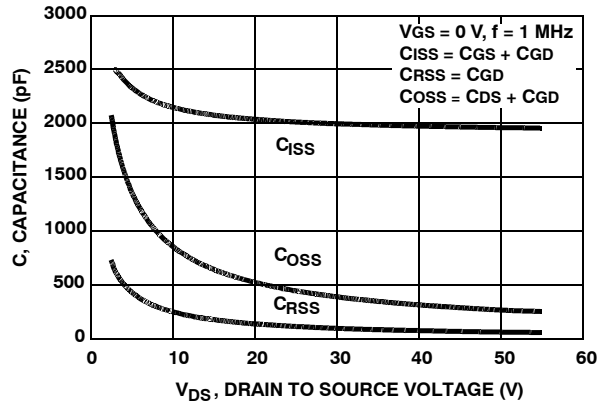


Figure 12. CAPACITANCE vs DRAIN TO SOURCE VOLTAGE

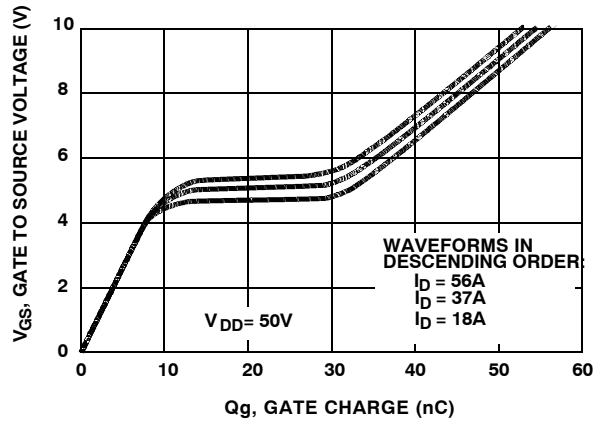


Figure 13. GATE CHARGE WAVEFORMS FOR CONSTANT GATE CURRENT

TEST CIRCUITS AND WAVEFORMS

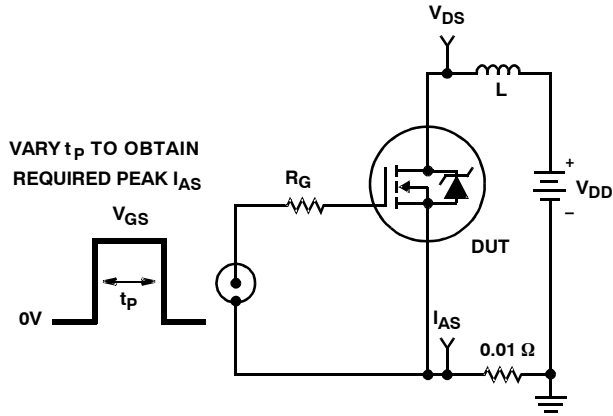


Figure 14. UNCLAMPED ENERGY TEST CIRCUIT

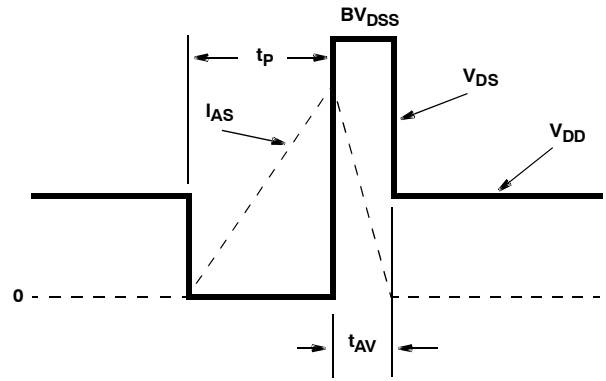


Figure 15. UNCLAMPED ENERGY WAVEFORMS

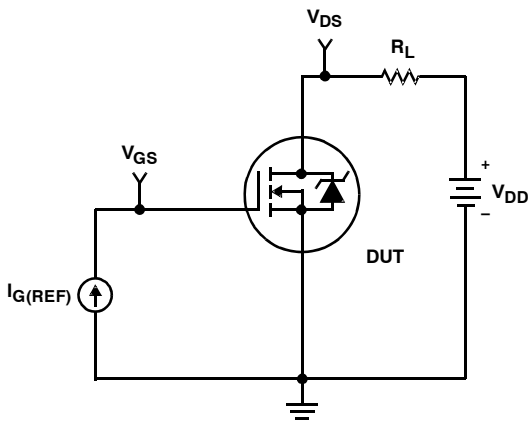


Figure 16. GATE CHARGE TEST CIRCUIT

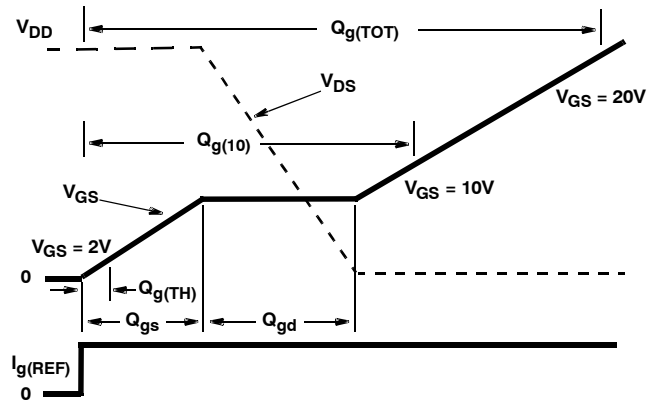


Figure 17. GATE CHARGE WAVEFORM

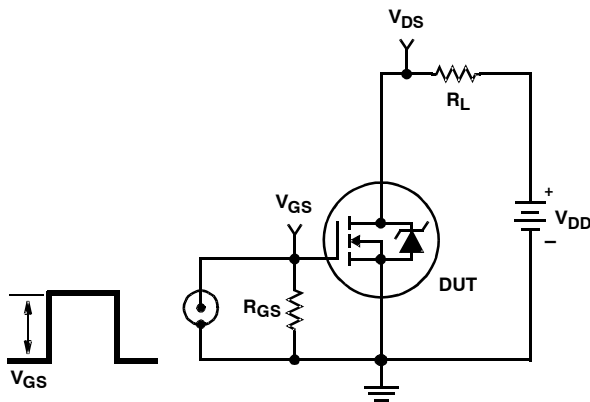


Figure 18. SWITCHING TIME TEST CIRCUIT

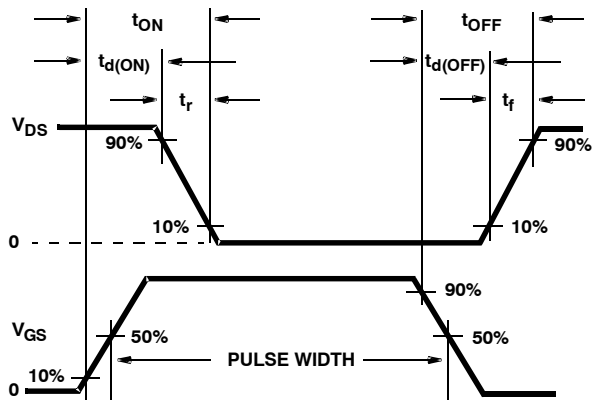


Figure 19. RESISTIVE SWITCHING WAVEFORMS

HUF75639G3, HUF75639P3, HUF75639S3S, HUF75639S3

PSPICE Electrical Model

SUBCKT HUF75639 2 1 3 ; rev Oct. 98
 CA 12 8 2.8e-9
 CB 15 14 2.65e-9
 CIN 6 8 1.9e-9

DBODY 7 5 DBODYMOD
 DBREAK 5 11 DBREAKMOD
 DPLCAP 10 5 DPLCAPMOD

EBREAK 11 7 17 18 110
 EDS 14 8 5 8 1
 EGS 13 8 6 8 1
 ESG 6 10 6 8 1
 EVTHRES 6 21 19 8 1
 EVTEMP 20 6 18 22 1

IT 8 17 1

LDRAIN 2 5 2e-9
 LGATE 1 9 1e-9
 LSOURCE 3 7 0.47e-9
 RLGATE 1 9 10
 RLDRAIN 2 5 20
 RLSOURCE 3 7 4.69

MMED 16 6 8 8 MMEDMOD
 MSTRO 16 6 8 8 MSTROMOD
 MWEAK 16 21 8 8 MWEAKMOD

RBREAK 17 18 RBREAKMOD 1
 RDRAIN 50 16 RDRAINMOD 1.3e-2
 RGATE 9 20 0.7
 RSLC1 5 51 RSLCMOD 1e-6
 RSLC2 5 50 1e3
 RSOURCE 8 7 RSOURCEMOD 4.5e-3
 RVTHRES 22 8 RVTHRESMOD 1
 RVTEMP 18 19 RVTEMPMOD 1

S1A 6 12 13 8 S1AMOD
 S1B 13 12 13 8 S1BMOD
 S2A 6 15 14 13 S2AMOD
 S2B 13 15 14 13 S2BMOD

VBAT 22 19 DC 1

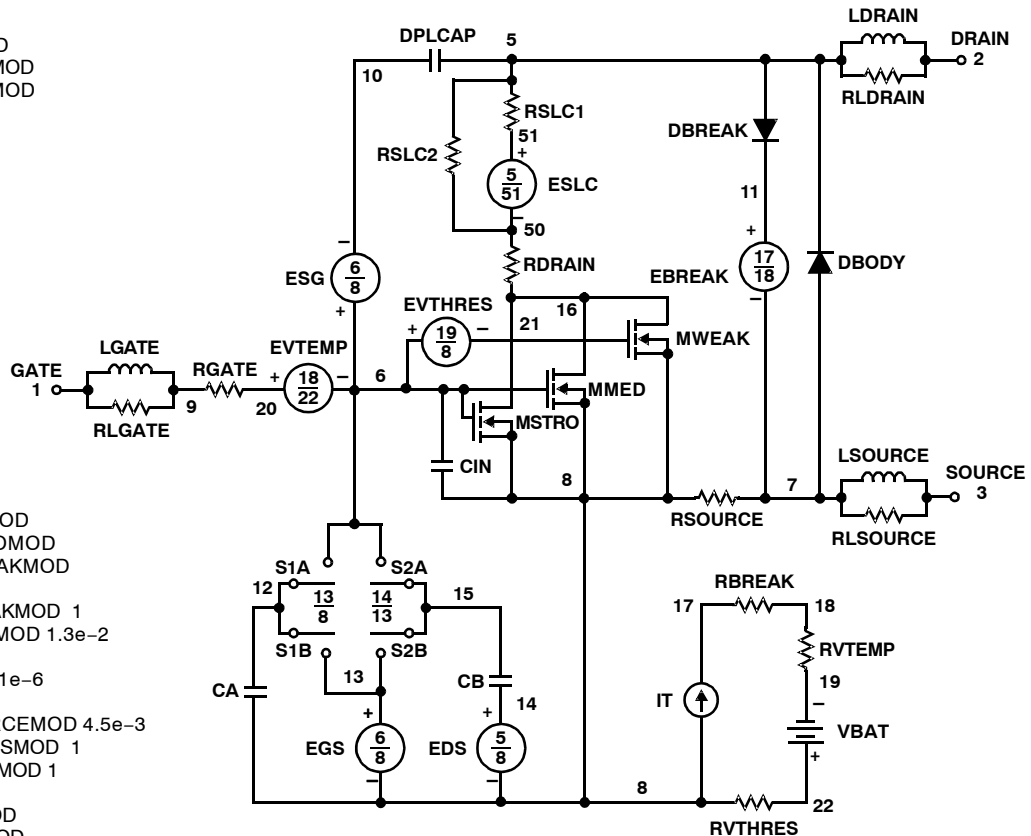
ESLC 51 50 VALUE = {(V(5,51)/ABS(V(5,51)))*(PWR(V(5,51))/(1e-6*115),4)}

.MODEL DBODYMOD D (IS = 1.4e-12 RS = 3.3e-3 XTI = 4.7 TRS1 = 2e-3 TRS2 = 0.1e-5 CJO = 3.3e-9 TT = 6.1e-8 M = 0.7)
 .MODEL DBREAKMOD D (RS = 3.5e-1 TRS1 = 1e-3 TRS2 = 1e-6)
 .MODEL DPLCAPMOD D (CJO = 2.2e-9 IS = 1e-3 ON = 10 M = 0.95 vj = 1.0)
 .MODEL MMEDMOD NMOS (VTO = 3.5 KP = 4.8 IS = 1e-30 N = 10 TOX = 1 L = 1u W = 1u Rg = 0.7)
 .MODEL MSTROMOD NMOS (VTO = 3.97 KP = 56.5 IS = 1e-30 N = 10 TOX = 1 L = 1u W = 1u)
 .MODEL MWEAKMOD NMOS (VTO = 3.11 KP = 0.085 IS = 1e-30 N = 10 TOX = 1 L = 1u W = 1u RG = 7 RS = 0.1)
 .MODEL RBREAKMOD RES (TC1 = 0.8e-3 TC2 = 1e-6)
 .MODEL RDRAINMOD RES (TC1 = 1e-2 TC2 = 1.75e-5)
 .MODEL RSLCMOD RES (TC1 = 2.8e-3 TC2 = 14e-6)
 .MODEL RSOURCEMOD RES (TC1 = 0 TC2 = 0)
 .MODEL RVTHRESMOD RES (TC = -2.0e-3 TC2 = -1.75e-5)
 .MODEL RVTEMPMOD RES (TC1 = -2.75e-3 TC2 = 0.05e-9)

.MODEL S1AMOD VSWITCH (RON = 1e-5 ROFF = 0.1 VON = -6.0 VOFF = -3.5)
 .MODEL S1BMOD VSWITCH (RON = 1e-5 ROFF = 0.1 VON = -3.5 VOFF = -6.0)
 .MODEL S2AMOD VSWITCH (RON = 1e-5 ROFF = 0.1 VON = -2.5 VOFF = 4.95)
 .MODEL S2AMOD VSWITCH (RON = 1e-5 ROFF = 0.1 VON = 4.95 VOFF = -2.5)

.ENDS

NOTE: For further discussion of the PSPICE model, consult **A New PSPICE Sub-Circuit for the Power MOSFET Featuring Global Temperature Options**; IEEE Power Electronics Specialist Conference Records, 1991, written by William J. Hepp and C. Frank Wheatley.



Spice Thermal Model

REV APRIL 1998

HUF75639

CTHERM1 TH 6 2.8e-3
 CTHERM2 6 5 4.6e-3
 CTHERM3 5 4 5.5e-3
 CTHERM4 4 3 9.2e-3
 CTHERM5 3 2 1.7e-2
 CTHERM6 2 TL 4.3e-2

RTHERM1 TH 6 5.0e-4
 RTHERM2 6 5 1.5e-3
 RTHERM3 5 4 2.0e-2
 RTHERM4 4 3 9.0e-2
 RTHERM5 3 2 1.9e-1
 RTHERM6 2 TL 2.9e-1

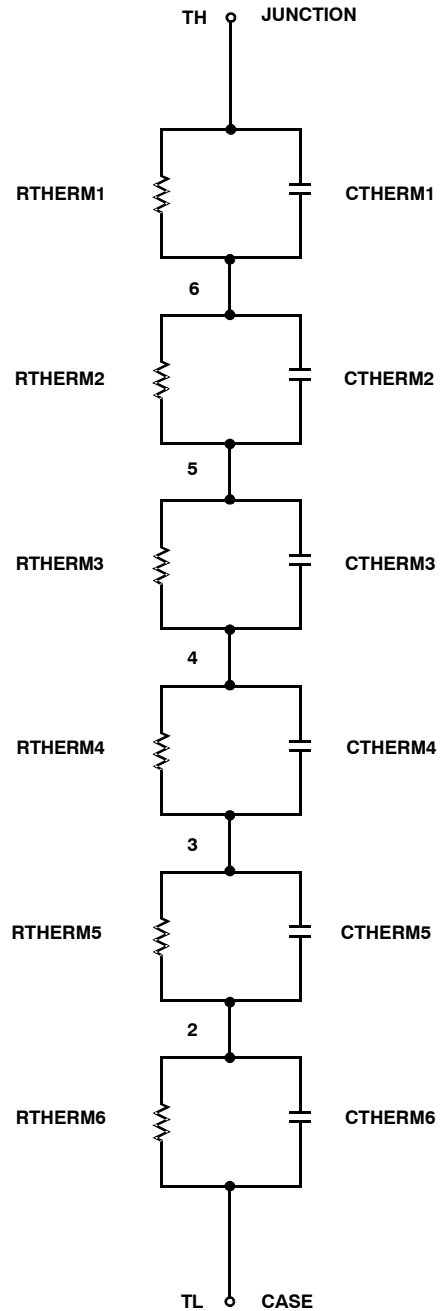
Saber Thermal Model

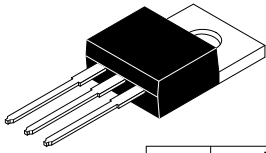
Saber thermal model HUF75639

template thermal_model th tl
 thermal_c th, tl

```
{
ctherm.ctherm1 th 6 = 2.8e-3
ctherm.ctherm2 6 5 = 4.6e-3
ctherm.ctherm3 5 4 = 5.5e-3
ctherm.ctherm4 4 3 = 9.2e-3
ctherm.ctherm5 3 2 = 1.7e-2
ctherm.ctherm6 2 tl = 4.3e-2
```

```
rtherm.rtherm1 th 6 = 5.0e-4
rtherm.rtherm2 6 5 = 1.5e-3
rtherm.rtherm3 5 4 = 2.0e-2
rtherm.rtherm4 4 3 = 9.0e-2
rtherm.rtherm5 3 2 = 1.9e-1
rtherm.rtherm6 2 tl = 2.9e-1
}
```

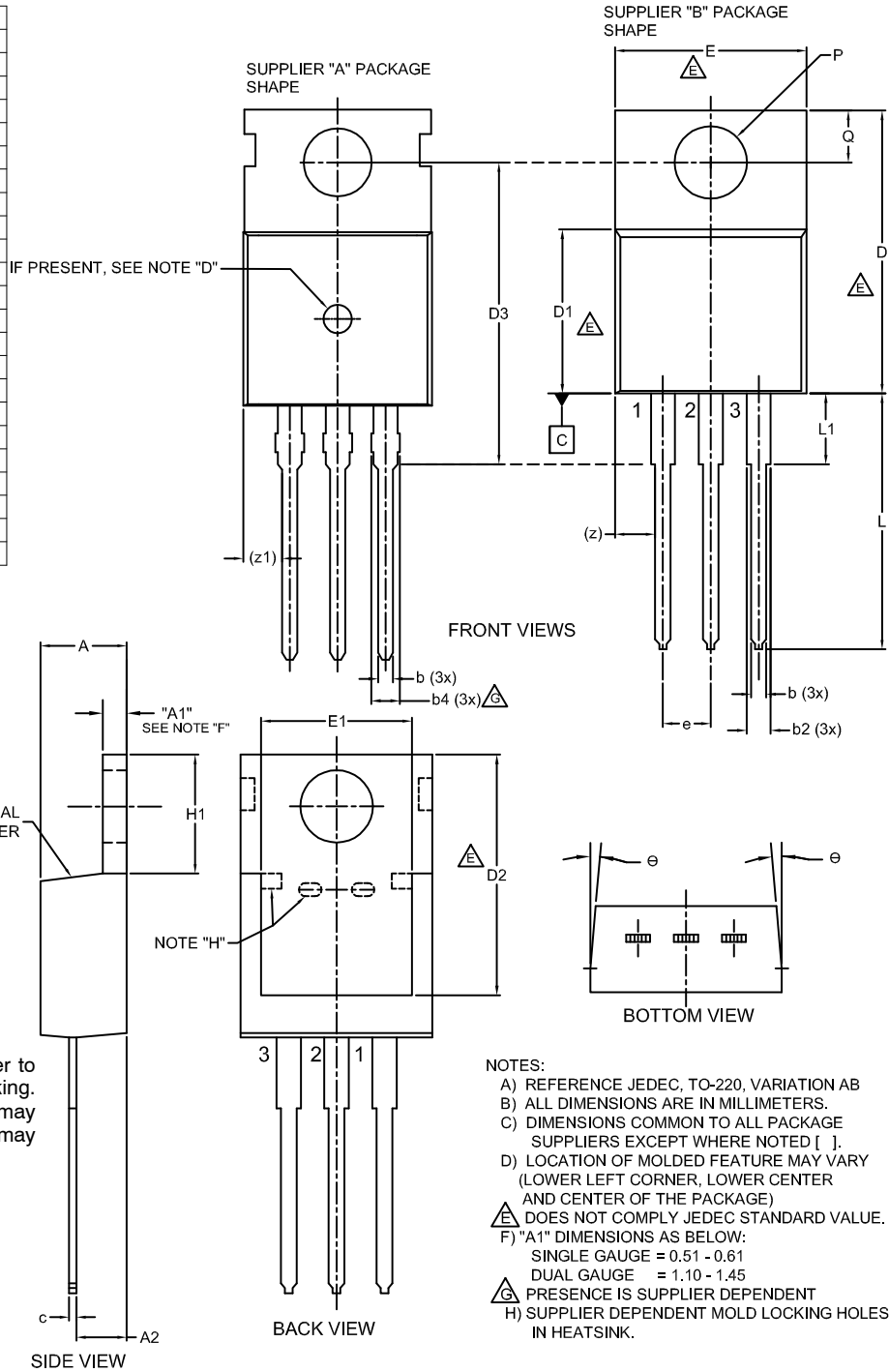




TO-220-3LD
CASE 340AT
ISSUE B

DATE 08 AUG 2022

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.00	--	4.70
A1	SEE NOTE "F"		
A2	2.10	--	2.85
b	0.55	--	1.00
b2	1.10	--	1.62
b4	1.42	--	1.62
c	0.36	--	0.60
D	13.90	--	16.30
D1	8.13	--	9.40
D2	11.50	--	14.30
D3	15.42	--	16.51
E	9.65	--	10.67
E1	7.59	--	8.65
e	2.40	--	2.67
H1	6.06	--	6.69
L	12.70	--	14.04
L1	2.70	--	4.10
P	3.50	--	4.00
Q	2.50	--	3.40
z	2.13 REF		
z1	2.06 REF		
θ	3°	--	5°



GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code
 A = Assembly Location
 Y = Year
 WW = Work Week
 ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

NOTES:

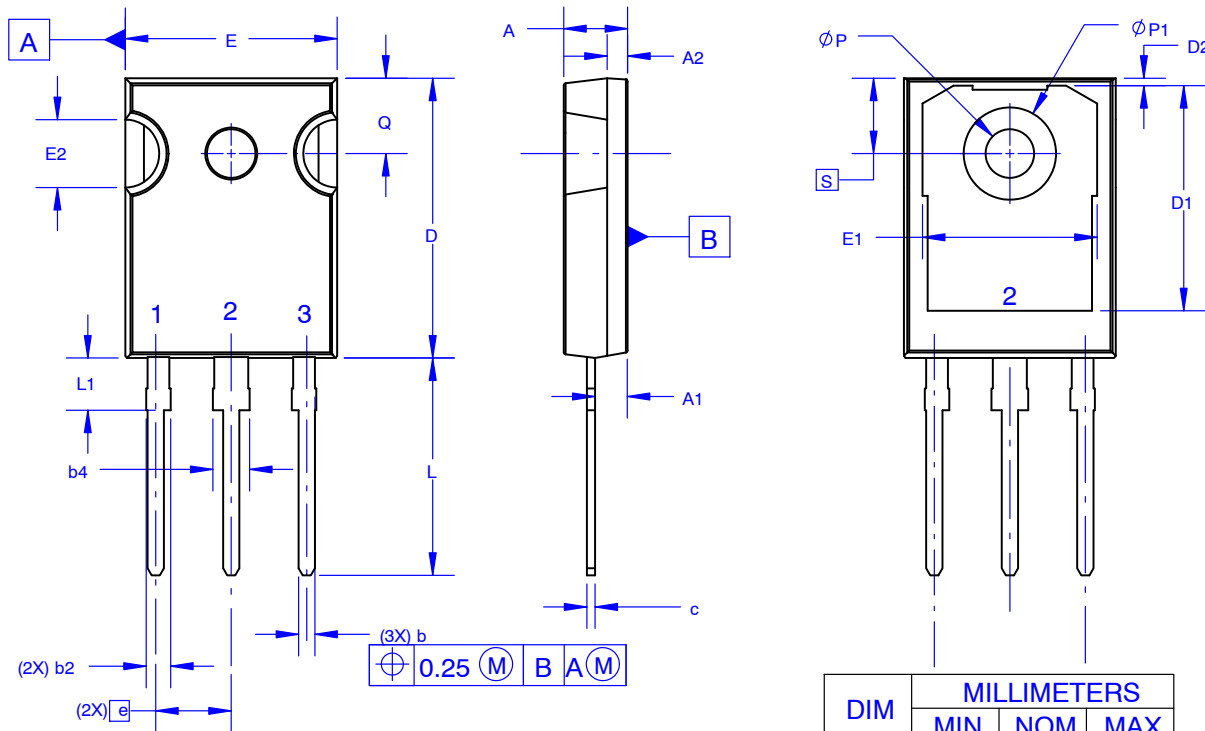
- A) REFERENCE JEDEC, TO-220, VARIATION AB
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [].
- D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
- ⚠ DOES NOT COMPLY JEDEC STANDARD VALUE.
- F) "A1" DIMENSIONS AS BELOW:
 SINGLE GAUGE = 0.51 - 0.61
 DUAL GAUGE = 1.10 - 1.45
- ⚠ PRESENCE IS SUPPLIER DEPENDENT
- H) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

DOCUMENT NUMBER:	98AON13818G	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	TO-220-3LD	PAGE 1 OF 1

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

TO-247-3LD SHORT LEAD
CASE 340CK
ISSUE A

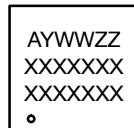
DATE 31 JAN 2019



NOTES: UNLESS OTHERWISE SPECIFIED.

- A. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5 - 2009.
- D. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.
- E. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.

GENERIC
MARKING DIAGRAM*



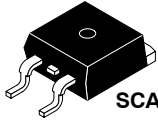
- XXXX = Specific Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.20	2.40	2.60
A2	1.40	1.50	1.60
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
b4	2.42	2.54	2.66
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	13.08	~	~
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	5.56	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
∅P	3.51	3.58	3.65
∅P1	6.60	6.80	7.00
Q	5.34	5.46	5.58
S	5.34	5.46	5.58

DOCUMENT NUMBER:	98AON13851G	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	TO-247-3LD SHORT LEAD	PAGE 1 OF 1

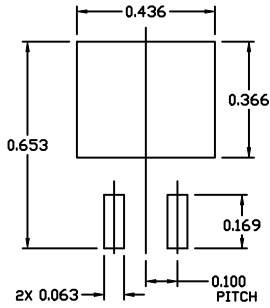
onsemi and Onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.



SCALE 1:1

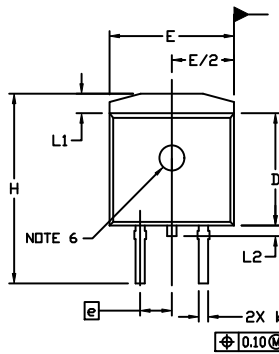
D²PAK-3 (TO-263, 3-LEAD)
CASE 418AJ
ISSUE F

DATE 11 MAR 2021



RECOMMENDED
MOUNTING FOOTPRINT

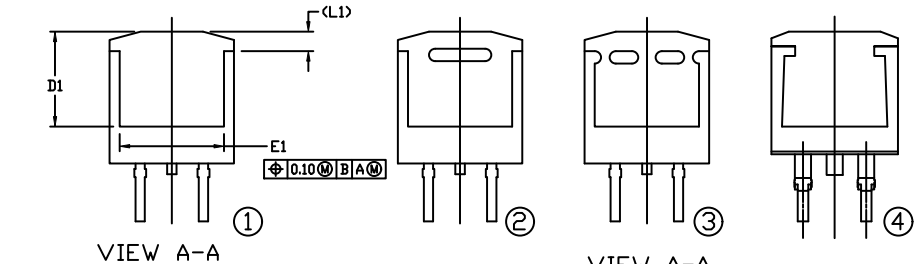
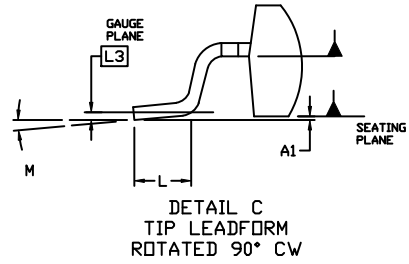
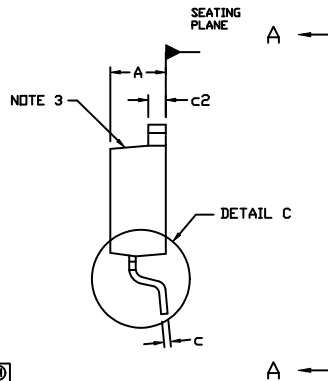
For additional information on our Pb-free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



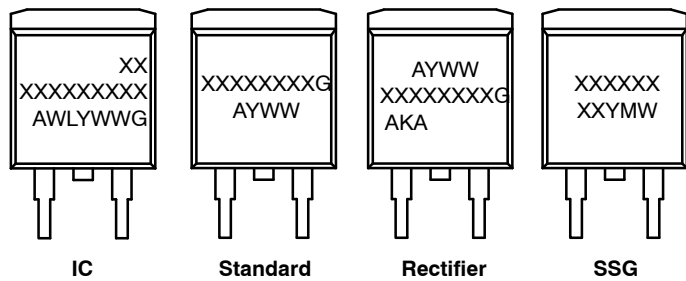
NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
- CONTROLLING DIMENSION: INCHES
- CHAMFER OPTIONAL.
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
- THERMAL PAD CONTOUR IS OPTIONAL WITHIN DIMENSIONS E, L1, D1, AND E1.
- OPTIONAL MOLD FEATURE.
- ①, ② ... OPTIONAL CONSTRUCTION FEATURE CALL OUTS.

DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.160	0.190	4.06	4.83
A1	0.000	0.010	0.00	0.25
b	0.020	0.039	0.51	0.99
c	0.012	0.029	0.30	0.74
c2	0.045	0.065	1.14	1.65
D	0.330	0.380	8.38	9.65
D1	0.260	---	6.60	---
E	0.380	0.420	9.65	10.67
E1	0.245	---	6.22	---
e	0.100	BSC	2.54	BSC
H	0.575	0.625	14.60	15.88
L	0.070	0.110	1.78	2.79
L1	---	0.066	---	1.68
L2	---	0.070	---	1.78
L3	0.010	BSC	0.25	BSC
M	0°	8°	0°	8°



GENERIC MARKING DIAGRAMS*



- XXXXXX = Specific Device Code
- A = Assembly Location
- WL = Wafer Lot
- Y = Year
- WW = Work Week
- W = Week Code (SSG)
- M = Month Code (SSG)
- G = Pb-Free Package
- AKA = Polarity Indicator

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON56370E	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	D ² PAK-3 (TO-263, 3-LEAD)	PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales