MOSFET – Power, N-Channel, UltraFET

75 V, 150 A, 0,016 Ω

HUFA75852G3-F085

Features

- Ultra Low On−Resistance
  − $R_{DS(ON)}$ = 0.016 Ω, V_{GS} = 10 V
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- AEC−Q101 Qualified and PPAP Capable
- This Device is Pb−Free and is RoHS Compliant

ON Semiconductor®

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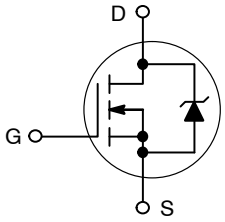
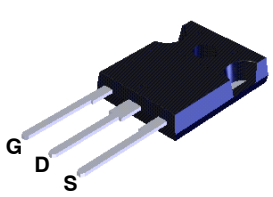
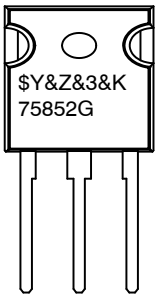




JEDEC TO−247
CASE 340CK

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Data Code (Year & Week)
&K	= Lot
75852G	= Specific Device Code

ORDERING INFORMATION

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

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, Unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage (Note 1)		150	V
V_{DGR}	Gate to Gate Voltage (R_{GS} = 20 kΩ) (Note 1)		150	V
V_{GS}	Gate to Source Voltage		±20	V
I_D	Drain Current Continuous (T_C = 25°C, V_{GS} = 10 V) (Figure 2)		75	A
	Drain Current Continuous (T_C = 100°C, V_{GS} = 10 V) (Figure 2)		75	A
I_{DM}	Pulsed Drain Current		Figure 4	
UIS	Pulsed Avalanche Rating		Figures 6, 14, 15	
P_D	Power Dissipation	(T_C = 25°C)	500	W
		− Derate Above 25°C	3.33	W/°C
T_J, T_{STG}	Operating and Storage Temperature		−55 to +175	°C
T_L	Maximum Temperature for Soldering	Leads at 0.063 in (1.6 mm) from Case for 10 s	300	°C
T_{pkg}		Package Body for 10 s	260	°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. Starting T_J = 25°C to 150°C.

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Package	Brand
HUFA75852G3−F085	TO−247	75852G

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
OFF STATE CHARACTERISTICS						
B_{VDSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V (Figure 11)	150			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 140 V, V_{GS} = 0 V			1	μA
		V_{DS} = 135 V, V_{GS} = 0 V, T_C = 150°C			250	
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20 V			±100	nA
ON STATE CHARACTERISTICS						
$V_{GS(TH)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA (Figure 10)	2.0		4.0	V
$R_{DS(ON)}$	Drain to Source On Resistance	I_D = 75 A, V_{GS} = 10 V (Figure 9)		0.013	0.016	Ω
THERMAL CHARACTERISTICS						
$R_{\theta JC}$	Thermal Resistance Junction to Case	TO−247			0.30	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient				30	°C/W
SWITCHING CHARACTERISTICS						
t_{on}	Turn-On Time	V_{DD} = 75 V I_D = 75 A V_{GS}= 10 V R_{GS} = 2.0 Ω (Figures 18, 19)			260	ns
$t_{d(on)}$	Turn-On Delay Time			22		ns
t_r	Rise Time			151		ns
$t_{d(off)}$	Turn-Off Delay Time			82		ns
t_f	Fall Time			107		ns
t_{off}	Turn-Off Time				285	ns
GATE CHARGE CHARACTERISTICS						
$Q_{g(TOT)}$	Total Gate Charge	V_{GS} = 0 V to 20 V; V_{DD} = 75 V, I_D = 75 A, $I_{g(REF)}$ = 1.0 mA (Figures 13,16,17)		400	480	nC
$Q_{g(10)}$	Total Gate Charge 10 V	V_{GS} = 0 V to 10 V; V_{DD} = 75 V, I_D = 75 A, $I_{g(REF)}$ = 1.0 mA (Figures 13,16,17)		215	260	nC
$Q_{g(TH)}$	Threshold Gate Charge	V_{GS} = 0 V to 2 V; V_{DD} = 75 V, I_D = 75 A, $I_{g(REF)}$ = 1.0 mA (Figures 13,16,17)		15	17.5	nC
Q_{gs}	Gate to Source Gate Charge	V_{DD} = 75 V, I_D = 75 A $I_{g(REF)}$ = 1.0 mA, (Figures 13,16, 17)		25		nC
Q_{gd}	Gate to Drain “Miller” Charge			66		nC
CAPACITANCE CHARACTERISTICS						
C_{ISS}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz (Figure 12)		7690		pF
C_{OSS}	Output Capacitance			1650		pF
C_{RSS}	Reverse Transfer Capacitance			535		pF
SOURCE TO DRAIN DIODE CHARACTERISTICS						
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 75 A			1.25	V
		I_{SD} = 35 A			1.00	V
t_{rr}	Reverse Recovery Time	I_{SD} = 75 A, dI_{SD}/dt = 100 A/μs			260	ns
Q_{rr}	Reverse Recovery Charge				1830	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.

TYPICAL CHARACTERISTICS

(T_C = 25°C unless otherwise noted)

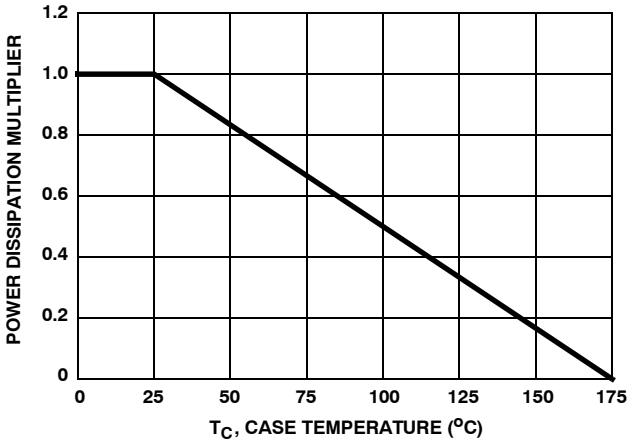


Figure 1. Normalized Power Dissipation vs. Case Temperature

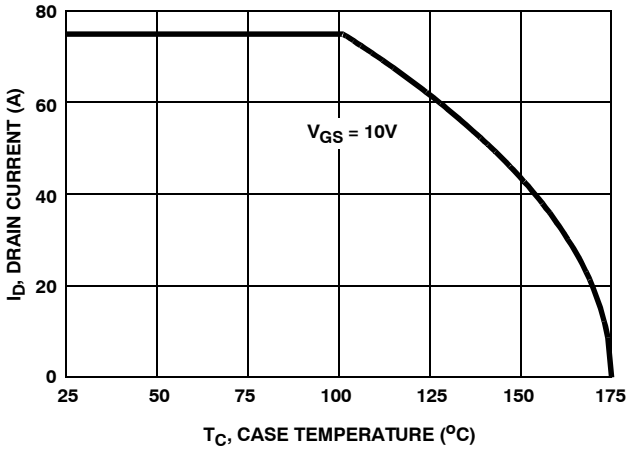


Figure 2. Maximum Continuous Drain Current vs Case Temperature

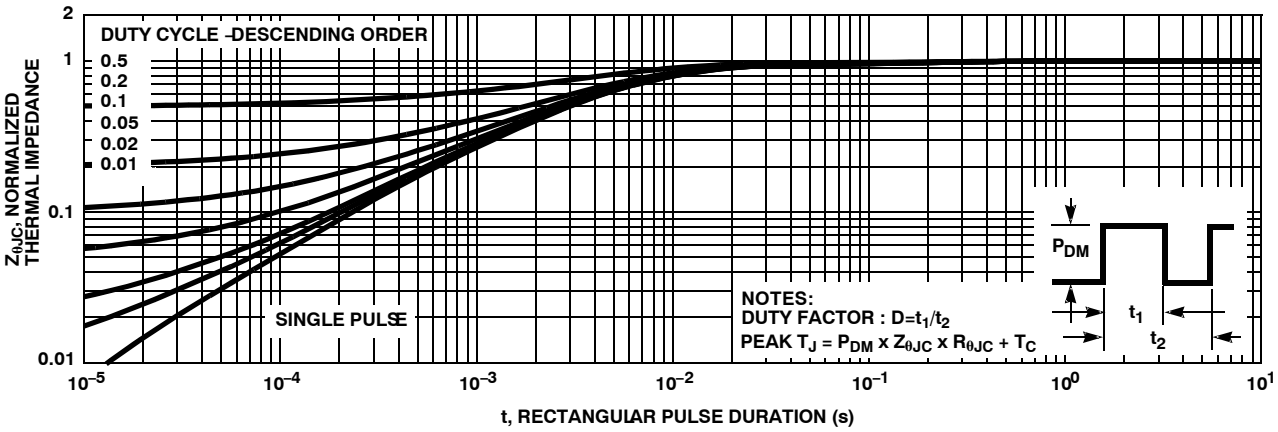


Figure 3. Normalized Maximum Transient Thermal Impedance

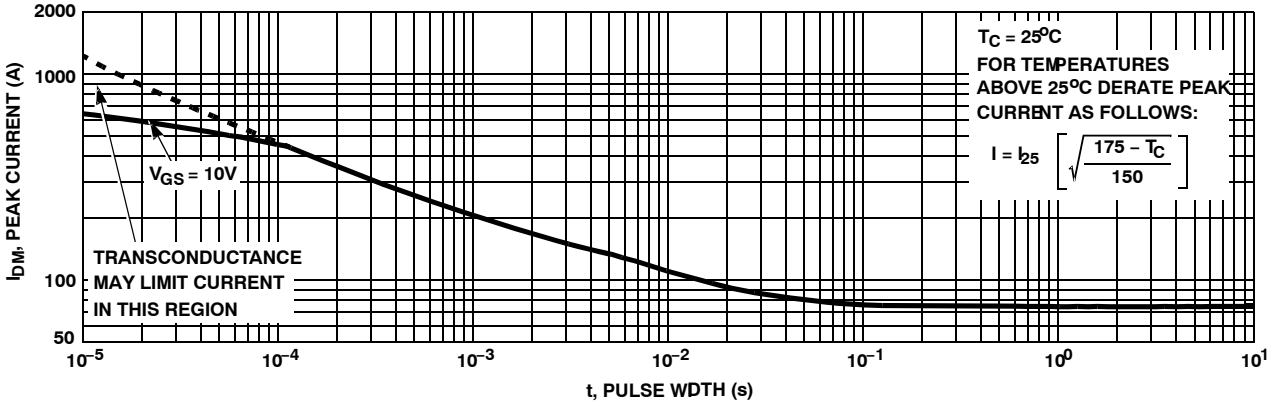


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (Continued)

T_C = 25°C unless otherwise noted

NOTE: Refer to ON Semiconductor Application Notes AN−7514 and AN−7515

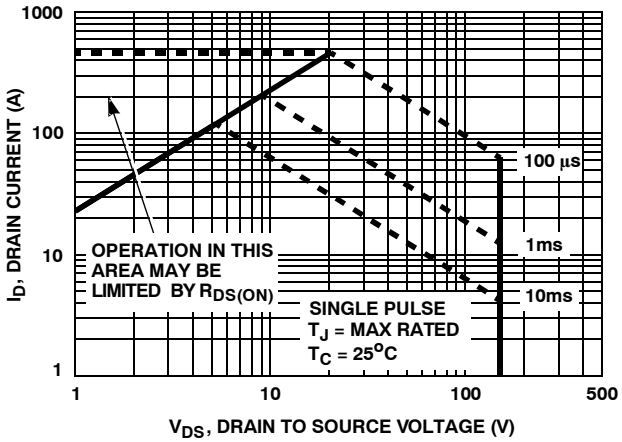


Figure 5. Forward Bias Safe Operating Area

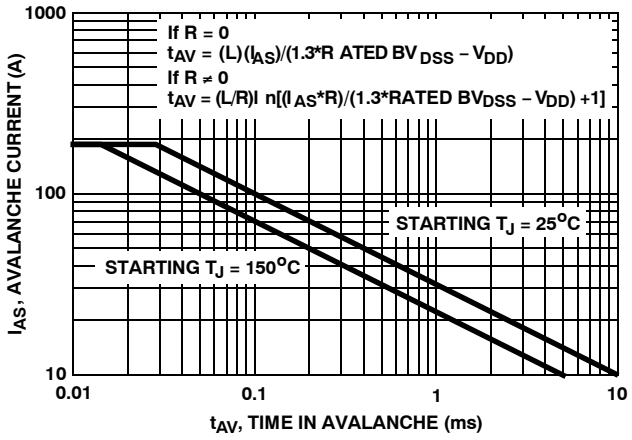


Figure 6. Unclamped Inductive Switching Capability

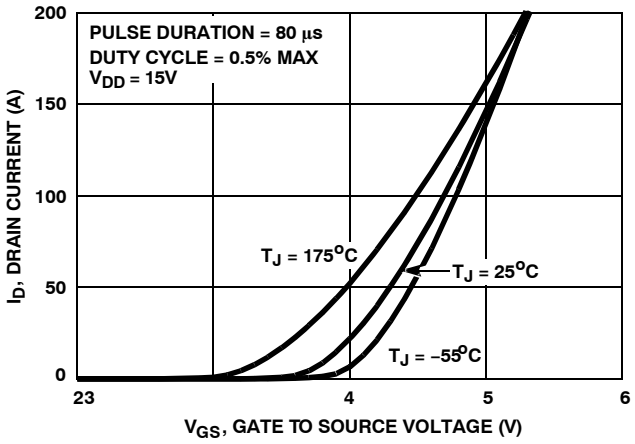


Figure 7. Transfer Characteristics

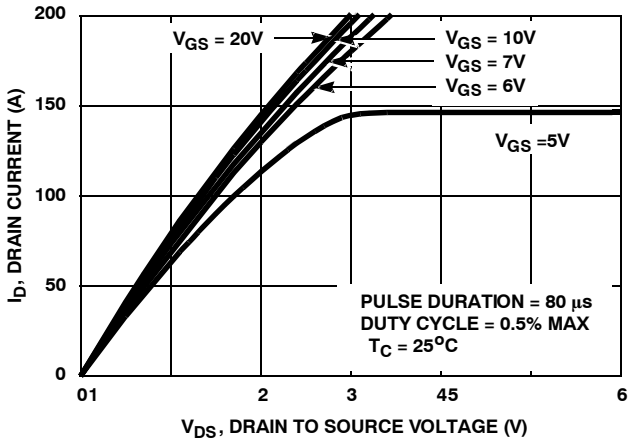


Figure 8. Saturation Characteristics

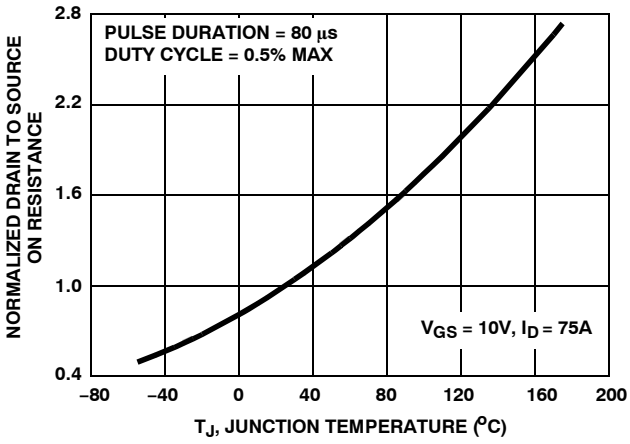


Figure 9. Normalized Drain to Source On Resistance vs Junction Temperature

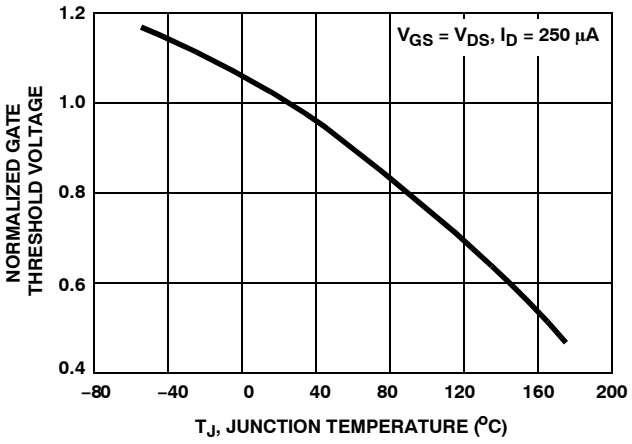


Figure 10. Normalized Gate Threshold Voltage vs Junction Temperature

TYPICAL CHARACTERISTICS (Continued)

(T_C = 25°C unless otherwise noted)

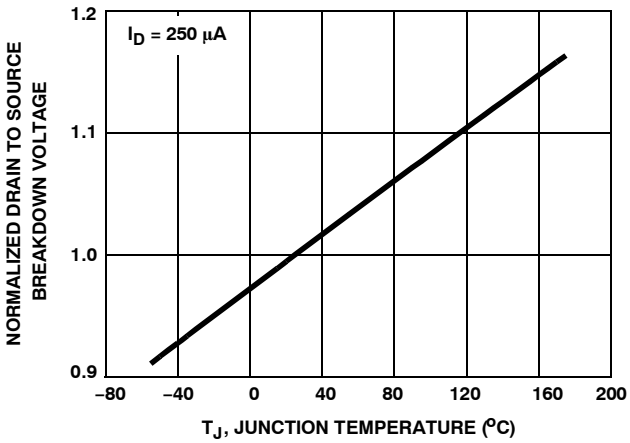


Figure 11. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

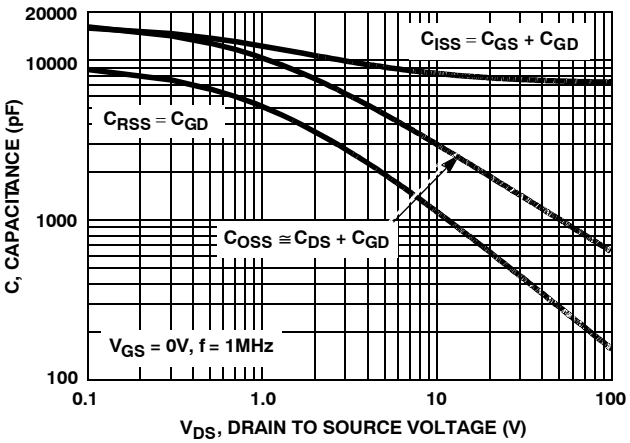


Figure 12. Capacitance vs. Drain to Source Voltage

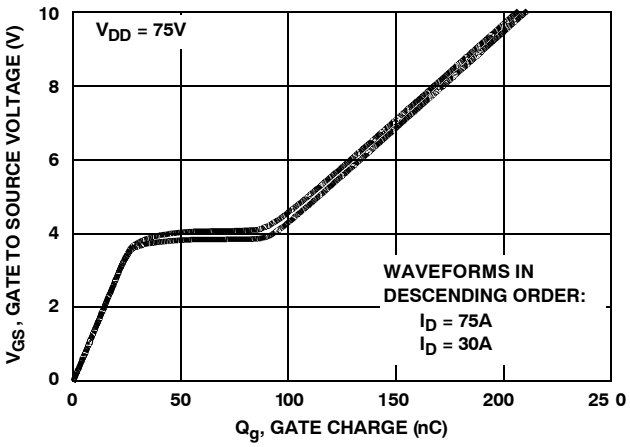


Figure 13. Gate Charge Waveforms for Constant Gate Current

TEST CIRCUITS AND WAVEFORMS

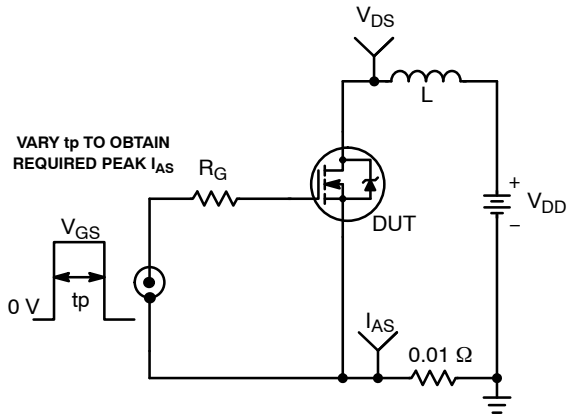


Figure 14. Unclamped Energy Test Curcuit

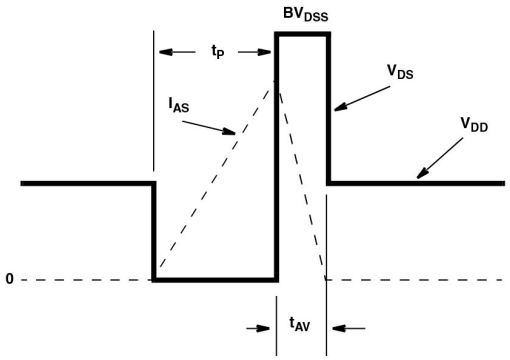


Figure 15. Unclamped Energy Waveforms

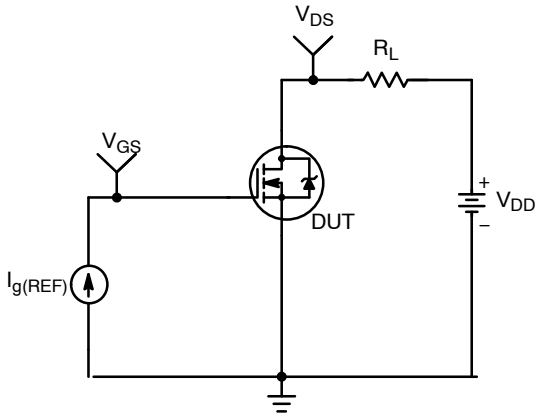


Figure 16. Gate Charge Test Circuit

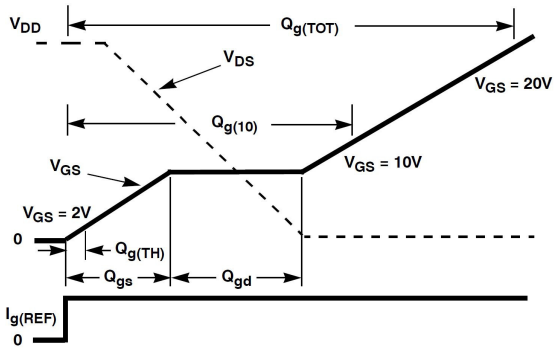


Figure 17. Gate Charge Waveforms

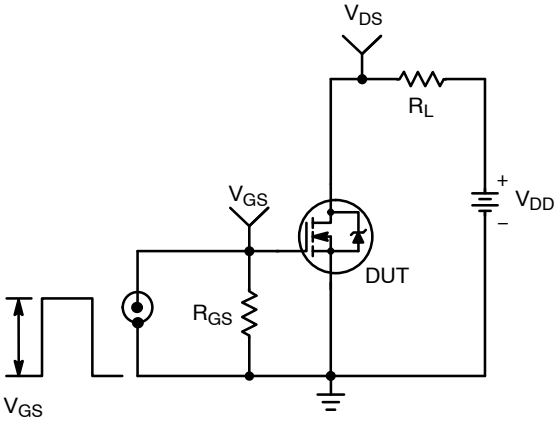


Figure 18. Switching Time Test Circuit

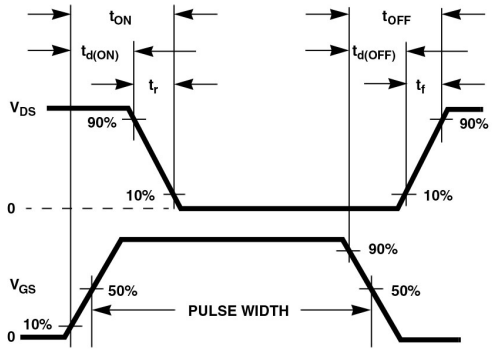


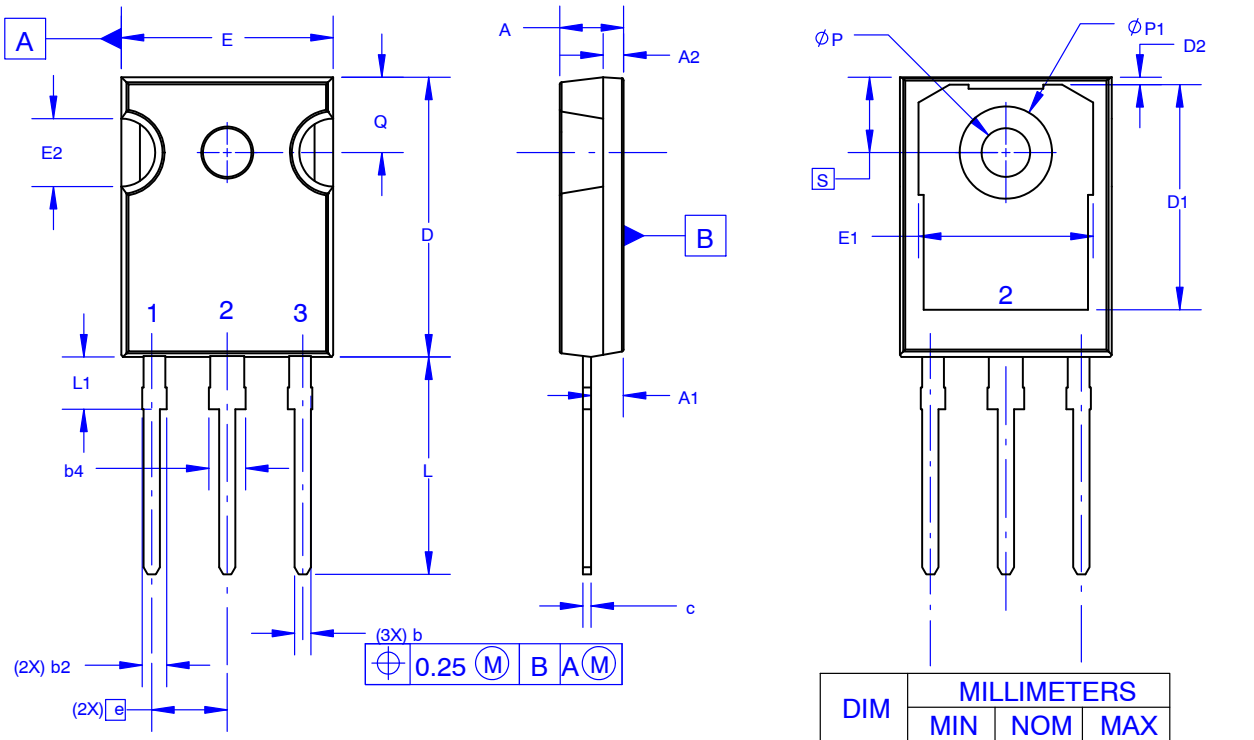
Figure 19. Switching Time Waveforms

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

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

DATE 31 JAN 2019

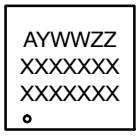


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.20	2.40	2.60
A2	1.40	1.50	1.60
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
b4	2.42	2.54	2.66
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	13.08	~	~
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	5.56	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
ØP	3.51	3.58	3.65
ØP1	6.60	6.80	7.00
Q	5.34	5.46	5.58
S	5.34	5.46	5.58

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.

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DESCRIPTION:	**TO−247−3LD SHORT LEAD**	**PAGE 1 OF 1**

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