

## Features

- Ultra-fast body diode
- Very low FOM  $R_{DS(on)} \times Q_g$
- Easy to use/drive

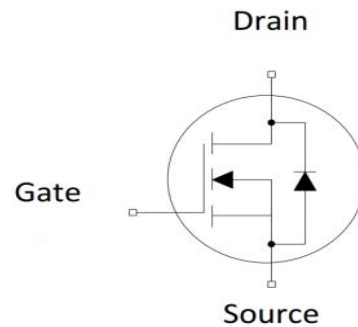
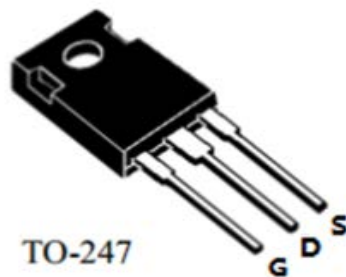
## Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- LLC Half-bridge
- Charger

## Product Summary

$V_{DS}$	650V
$R_{DS(on)}$ typ.	44m $\Omega$
$I_D$	72A

**100% DVDS Tested**  
**100% Avalanche Tested**



## Key Performance Parameters

Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	700	V
$R_{DS(on),max}$	0.044	$\Omega$
$Q_{g,typ}$	165	nC
$I_D$	72	A
$I_{D,pulse}$	216	A
$E_{OSS} @ 400V$	19.49	$\mu J$
Body Diode $di_f/dt$	500	A/ $\mu s$
$t_{rr}$	242	ns
$Q_{rr}$	1.5	$\mu C$
$I_{rrm}$	12	A

<b>Absolute Maximum Ratings</b> $T_C = 25^\circ\text{C}$ , unless otherwise noted				
Parameter		Symbol	Value	Unit
Continuous Drain Current	$T_C = 25^\circ\text{C}$	$I_D$	72	A
	$T_C = 100^\circ\text{C}$		43.2	
Pulsed Drain Current	(note1)	$I_{D,pulse}$	216	A
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Single Pulse Avalanche Energy	(note2)	$E_{AS}$	2185	mJ
Repetitive Avalanche Energy	(note2)	$E_{AR}$	3.31	mJ
Avalanche Current		$I_{AR}$	13.7	A
MOSFET dv/dt Ruggedness, $V_{DS} = 0 \dots 480\text{V}$		dv/dt	50	V/ns
Power Dissipation For TO-247		$P_D$	500	W
Continuous Diode Forward Current		$I_S$	61	A
Diode Pulsed Current	(note1)	$I_{S,pulse}$	216	
Reverse Diode dv/dt	(note3)	dv/dt	50	V/ns
Maximum Diode Commutation Speed	(note3)	$di_f/dt$	900	A/ $\mu\text{s}$
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~+150	$^\circ\text{C}$

<b>Thermal Resistance For TO-247</b>			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{thJC}$	0.25	$^\circ\text{C} / \text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	62	

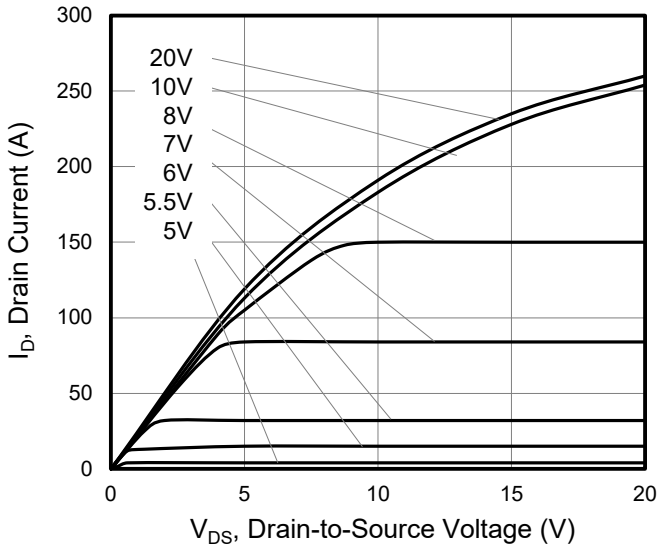
Electrical Characteristics $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	650	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	5	$\mu\text{A}$
		$V_{DS} = 650V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	--	--	10000	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	3	4	5	V
Drain-Source On-State-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 36A$	--	0.037	0.044	$\Omega$
Gate Resistance	$R_G$	$f = 1.0\text{MHz}$ open drain	--	0.3	--	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 100V,$ $f = 1.0\text{MHz}$	--	7837	--	pF
Output Capacitance	$C_{oss}$		--	221	--	
Reverse Transfer Capacitance	$C_{rss}$		--	13.2	--	
Total Gate Charge	$Q_g$	$V_{DD} = 520V, I_D = 50A,$ $V_{GS} = 10V$	--	165	--	nC
Gate-Source Charge	$Q_{gs}$		--	50	--	
Gate-Drain Charge	$Q_{gd}$		--	70	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 400V, I_D = 50A,$ $R_G = 25\Omega$	--	103	--	ns
Turn-on Rise Time	$t_r$		--	83	--	
Turn-off Delay Time	$t_{d(off)}$		--	543	--	
Turn-off Fall Time	$t_f$		--	93	--	
<b>Drain-Source Body Diode Characteristics</b>						
Body Diode Forward Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 36A, V_{GS} = 0V$	--	1.0	1.5	V
Reverse Recovery Time	$t_{rr}$	$V_R = 400V, I_F = 36A,$ $di_F/dt = 100A/\mu\text{s}$	--	242	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	1.45	--	$\mu\text{C}$
Peak Reverse Recovery Current	$I_{rrm}$		--	12	--	A

**Notes**

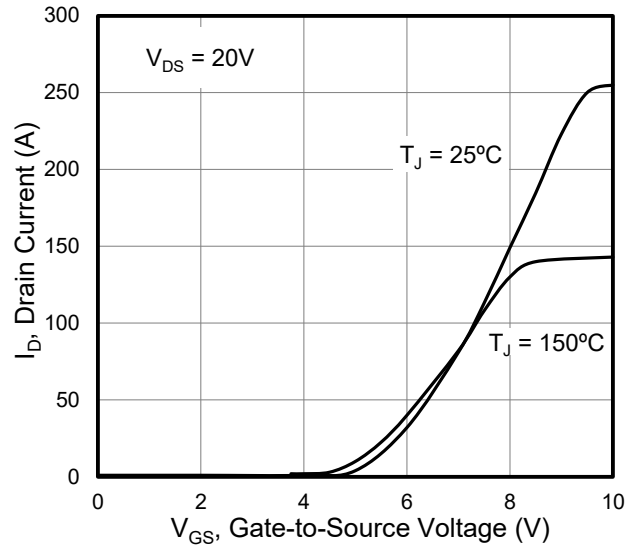
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2.  $I_{AS} = 13.7A, V_{DD} = 50V, R_G = 25\Omega,$  Starting  $T_J = 25^\circ\text{C}$
3. Identical low side and high side switch with identical  $R_G$

**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

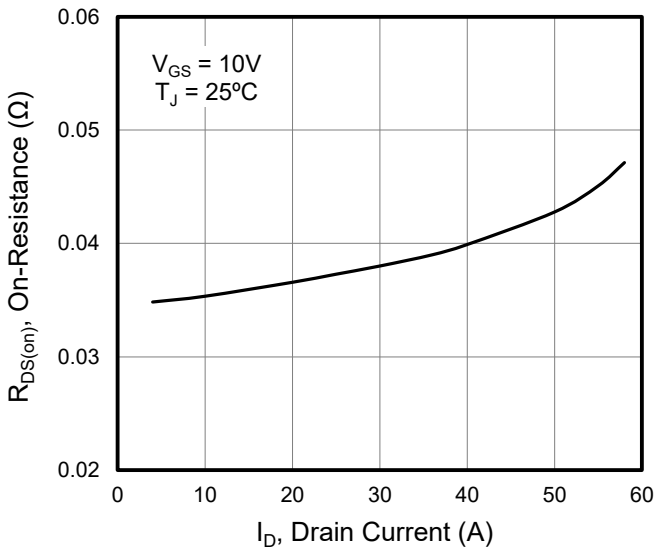
**Figure 1. Output Characteristics**



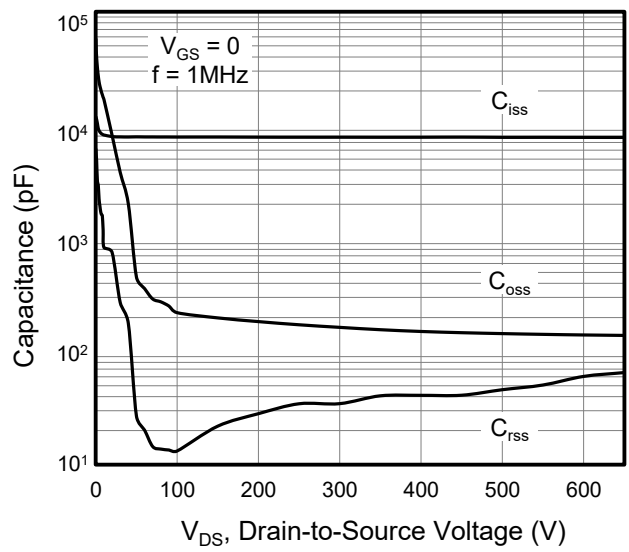
**Figure 2. Transfer Characteristics**



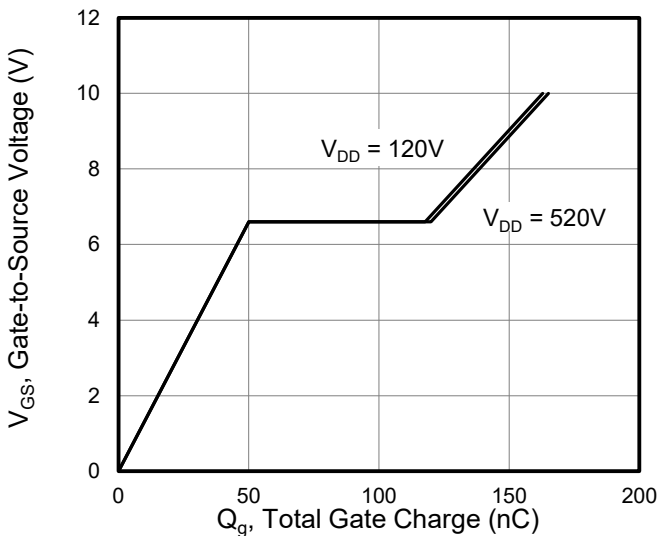
**Figure 3. On-Resistance vs. Drain Current**



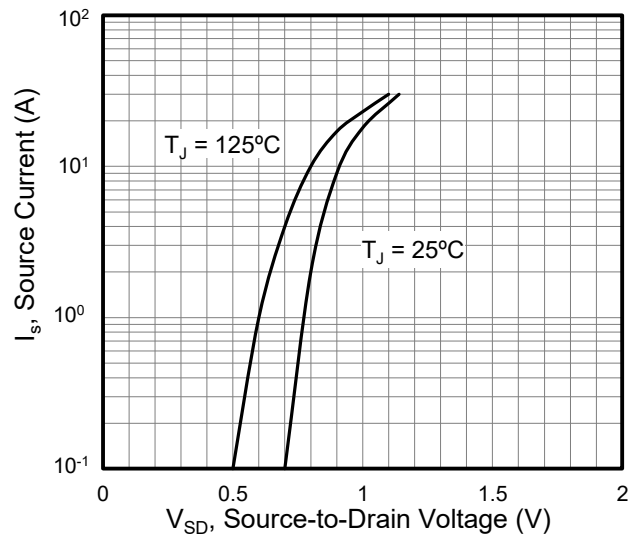
**Figure 4. Capacitance**



**Figure 5. Gate Charge**



**Figure 6. Body Diode Forward Voltage**



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

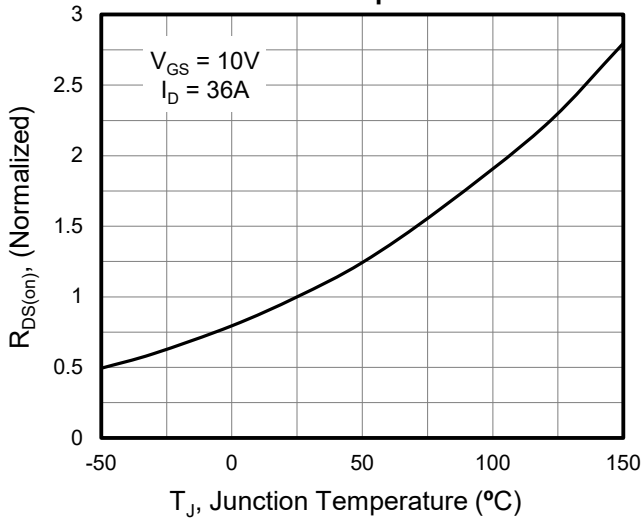


Figure 8. Breakdown voltage vs. Junction Temperature

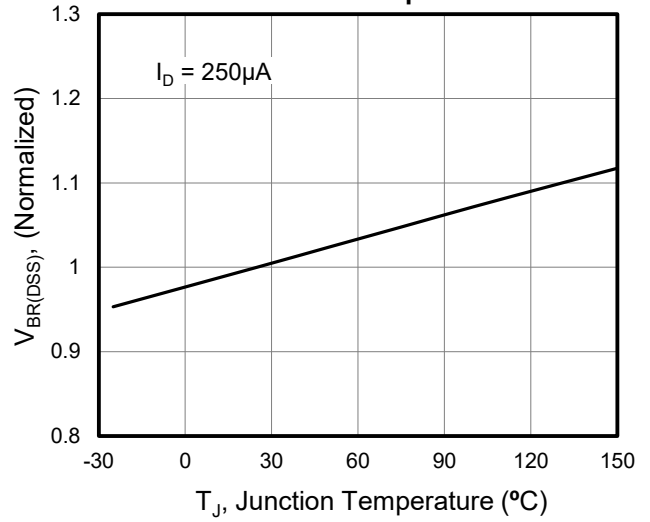


Figure 9. Transient Thermal Impedance For TO-247

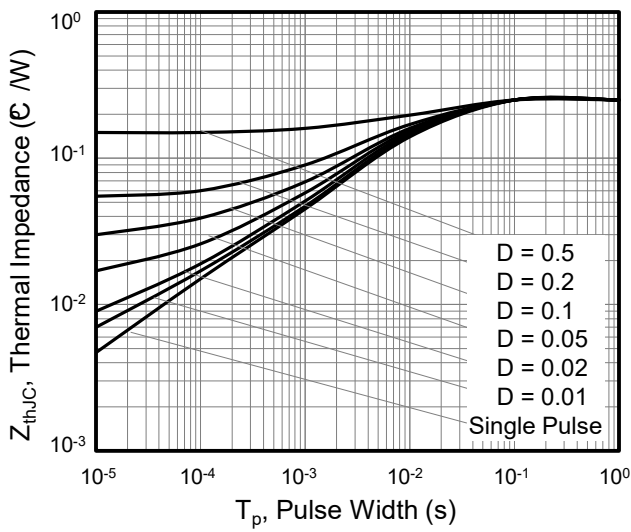


Figure 10. Safe Operation Area For TO-247

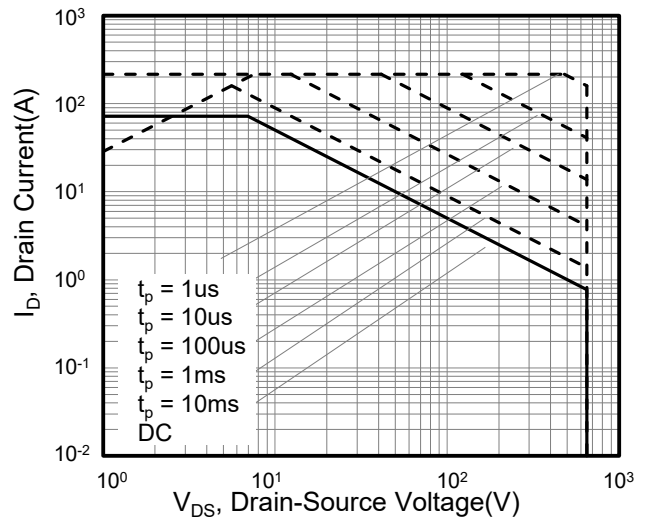
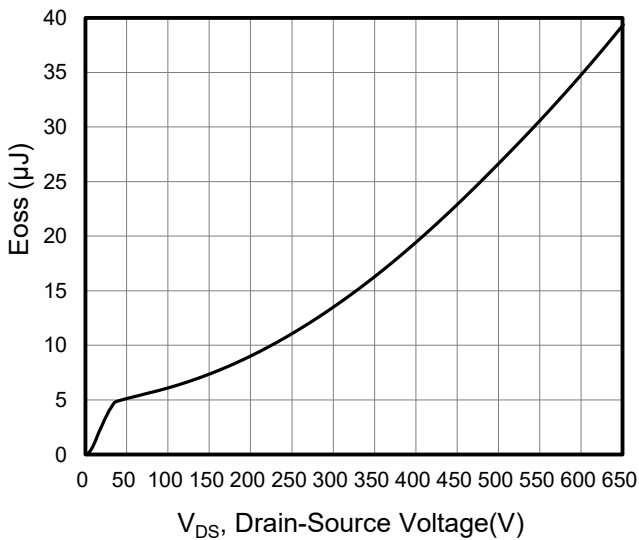
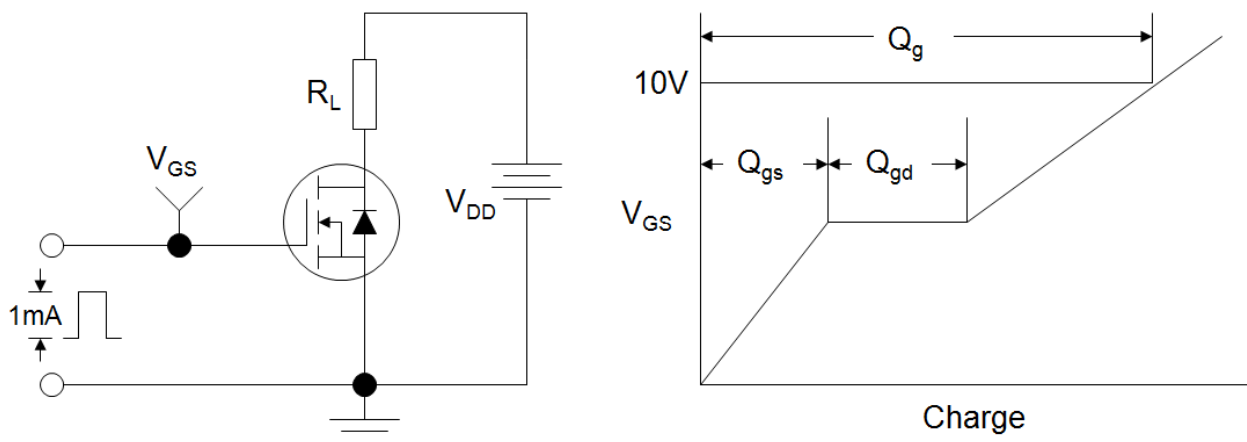


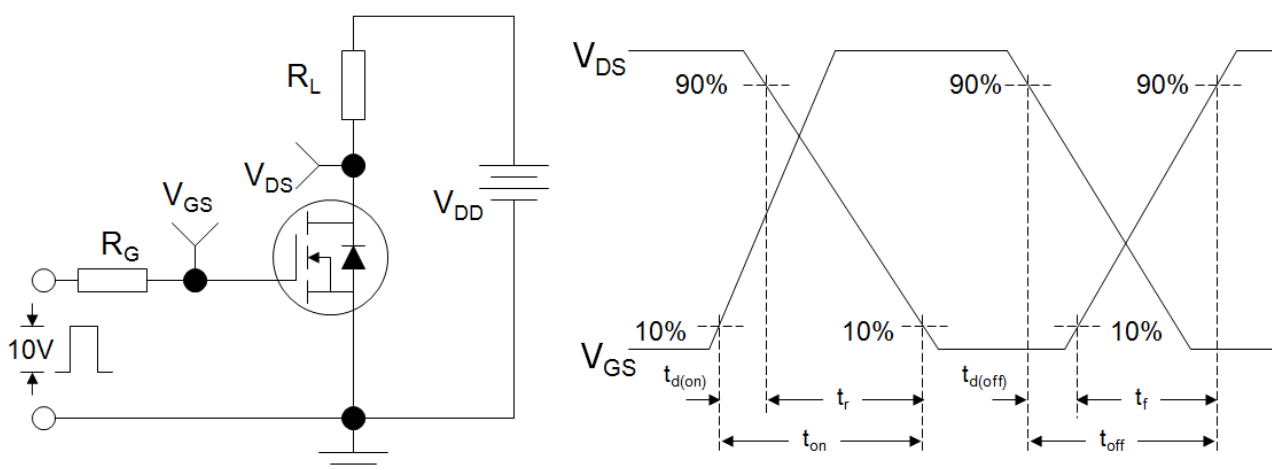
Figure 11. Typ. Coss Stored Energy



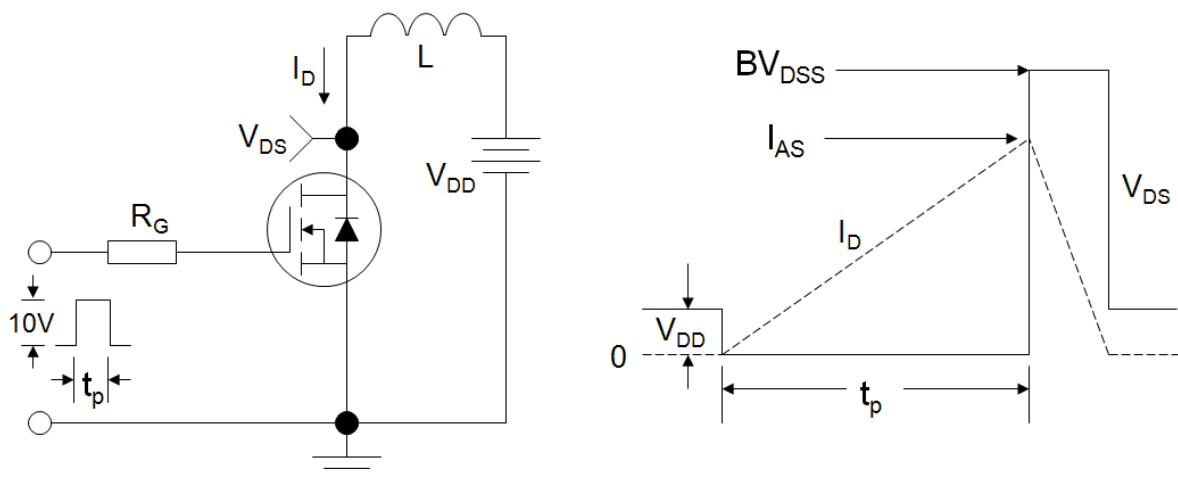
**Figure A: Gate Charge Test Circuit and Waveform**



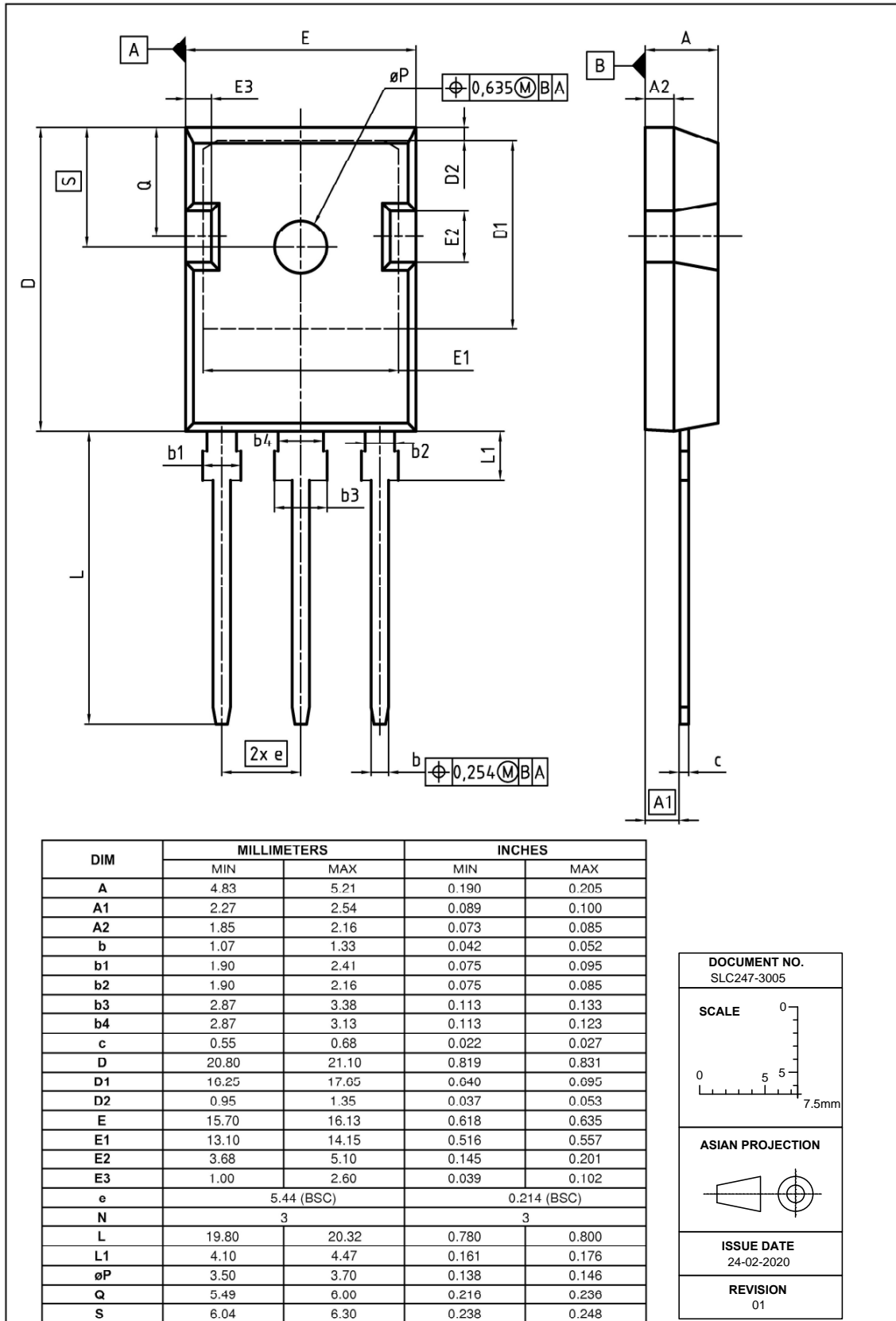
**Figure B: Resistive Switching Test Circuit and Waveform**



**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**



PackageOutlines-TO-247



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [Tokmas](#) manufacturer:*

Other Similar products are found below :

[614233C](#) [648584F](#) [IRFD120](#) [IRFF430](#) [JANTX2N5237](#) [2N7000](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [AOD464](#) [2SK2267\(Q\)](#) [2SK2545\(Q,T\)](#)  
[405094E](#) [423220D](#) [MIC4420CM-TR](#) [VN1206L](#) [614234A](#) [715780A](#) [SSM6J414TU,LF\(T](#) [751625C](#) [BSC884N03MS G](#) [BSF024N03LT3 G](#)  
[PSMN4R2-30MLD](#) [TK31J60W5,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [FCAB21350L1](#) [P85W28HP2F-](#)  
[7071](#) [DMN1053UCP4-7](#) [NTE2384](#) [NTE2969](#) [NTE6400A](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#)  
[SSM6P54TU,LF](#) [DMP22D4UFO-7B](#) [IPS60R3K4CEAKMA1](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [STU5N65M6](#)  
[C3M0021120D](#) [DMN13M9UCA6-7](#) [BSS340NWH6327XTSA1](#) [MCM3400A-TP](#) [DMTH10H4M6SPS-13](#) [IRF40SC240ARMA1](#)  
[IPS60R1K0PFD7SAKMA1](#)