

Features

- Enhancement Mode
- Very Low On-Resistance
- Fast Switching

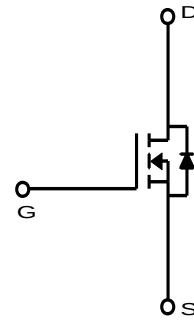
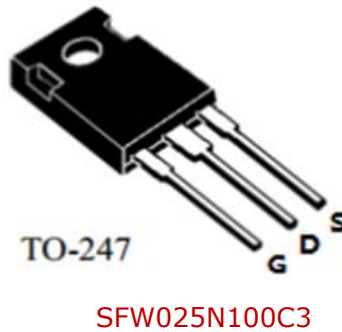
Product Summary

V_{DS}	100V
$R_{DS(on)}$ typ.	2.3mΩ
I_D	190A

Applications

- Motor control and drive
- DC/DC Converter
- General Purpose Applications

100% DVDS Tested
100% Avalanche Tested



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFW025N100C3	025N100C3	TO-247	Tube	N/A	N/A	30pcs

Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_C=25^\circ\text{C}$ (Silicon Limited)	I_D	272	A
	$T_C=25^\circ\text{C}$ (Package Limited)		190	
	$T_C=100^\circ\text{C}$ (Silicon Limited)		192	
Pulsed Drain Current ⁽²⁾		I_{DM}	800	
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	416	W
	$T_C=100^\circ\text{C}$		208	
Single Pulse Avalanche Energy ⁽³⁾		E_{AS}	512	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~175	$^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.36	

Electrical Characteristics ($T_C = 25^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	100	118	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	-	4.0	
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$	-	-	± 0.1	
Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 80\text{A}$	-	2.3	2.8	mΩ
Forward Transconductance	g_{fs}	$V_{DS} = 10\text{V}, I_D = 50\text{A}$	-	110	-	S

Dynamic Characteristics

Total Gate Charge	Q_g	$V_{DS} = 50\text{V}, I_D = 50\text{A}, V_{GS} = 10\text{V}$	-	147	-	nC
Gate-Source Charge	Q_{gs}		-	42	-	
Gate-Drain Charge	Q_{gd}		-	28	-	
Input Capacitance	C_{iss}	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	-	10,420	-	pF
Reverse Transfer Capacitance	C_{rss}		-	36	-	
Output Capacitance	C_{oss}		-	2,050	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 50\text{V}, I_D = 50\text{A}, R_G = 3.0\Omega$	-	33	-	ns
Rise Time	t_r		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	123	-	
Fall Time	t_f		-	45	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	3.0	-	Ω

Drain-Source Body Diode Characteristics

Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 50\text{A}, V_{GS} = 0\text{V}$	-	0.9	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 50\text{A}, dI/dt = 100\text{A}/\mu\text{s}$	-	98		ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	275		nC

Note :

1. Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at $T_C = 25^\circ\text{C}$ is silicon limited
2. Pulse width limited by T_{Jmax}
3. E_{AS} is tested at starting $T_J = 25^\circ\text{C}$, $L = 1.0\text{mH}$, $I_{AS} = 32\text{A}$, $V_{GS} = 10\text{V}$.

Typical Performance Characteristics

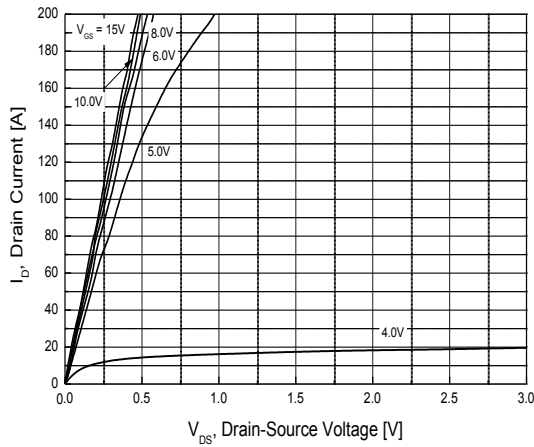


Fig.1 On-Region Characteristics

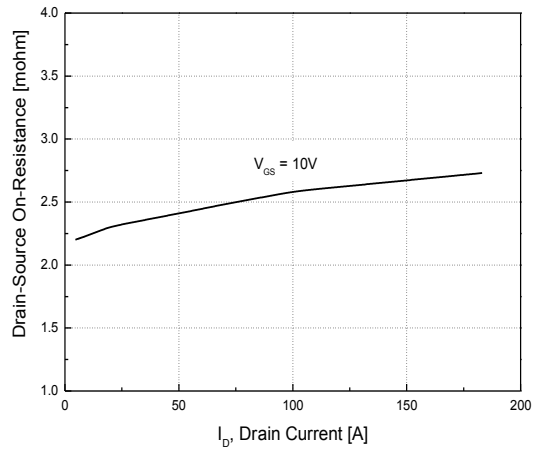


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

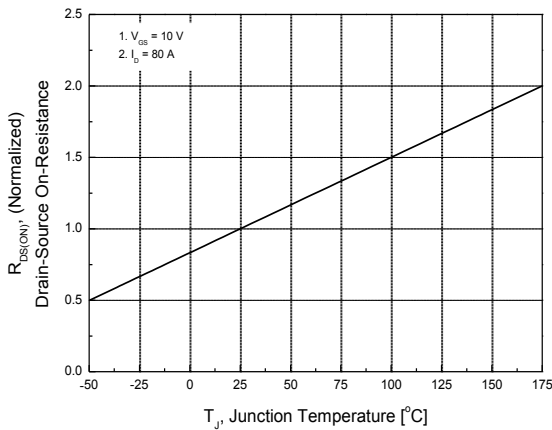


Fig.3 On-Resistance Variation with Temperature

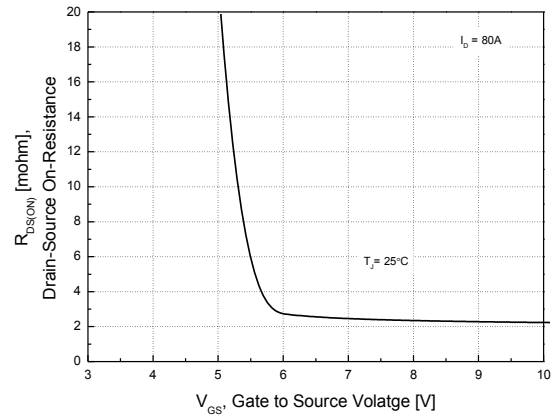


Fig.4 On-Resistance Variation with Gate to Source Voltage

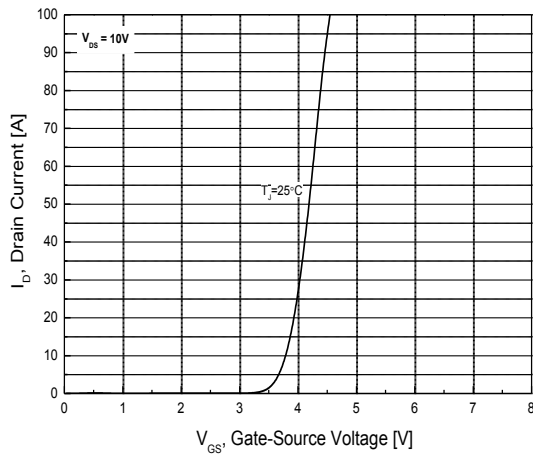


Fig.5 Transfer Characteristics

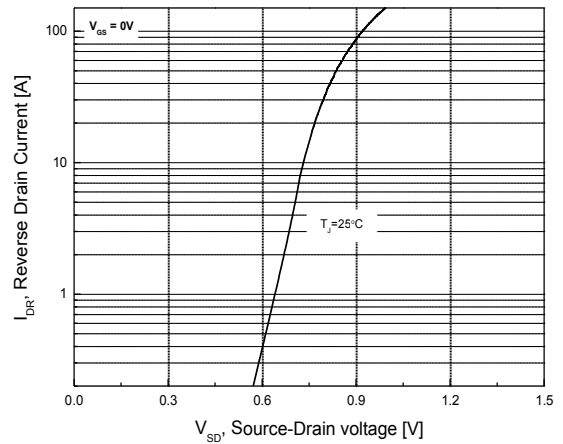
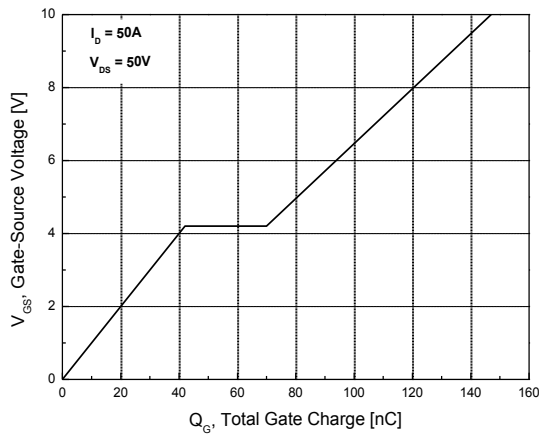
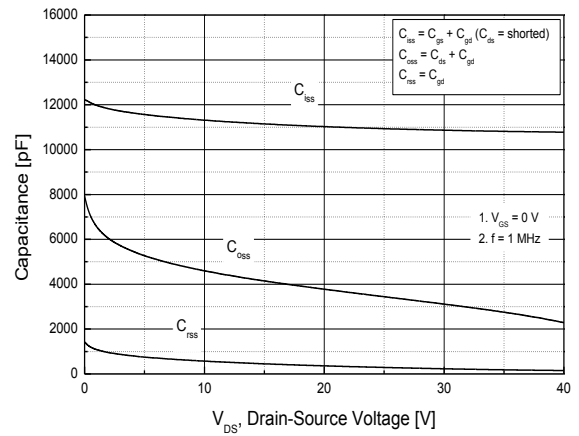
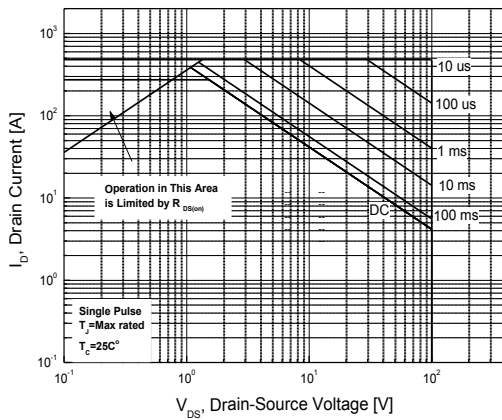
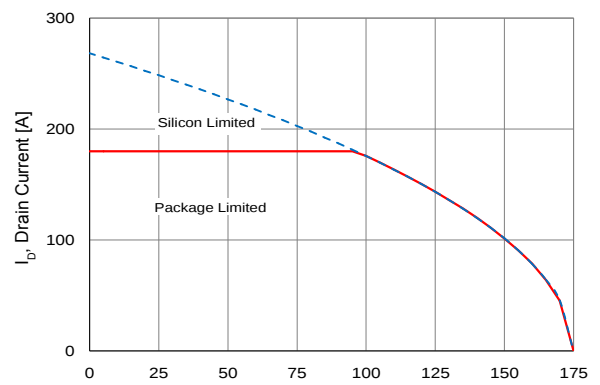
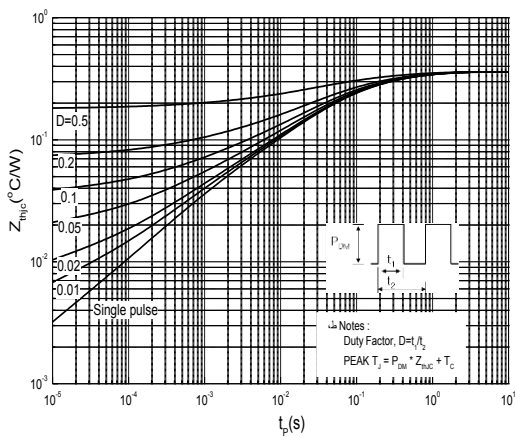
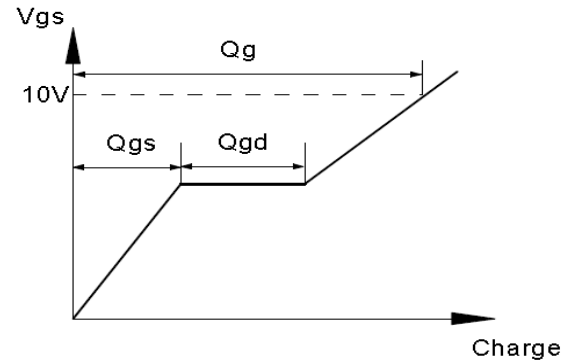
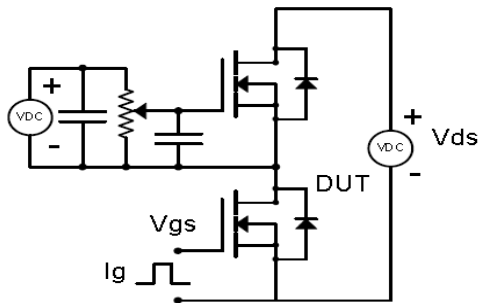


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

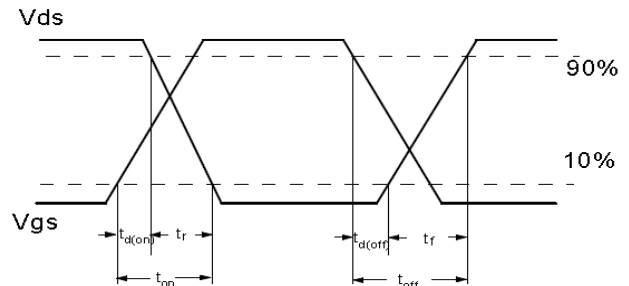
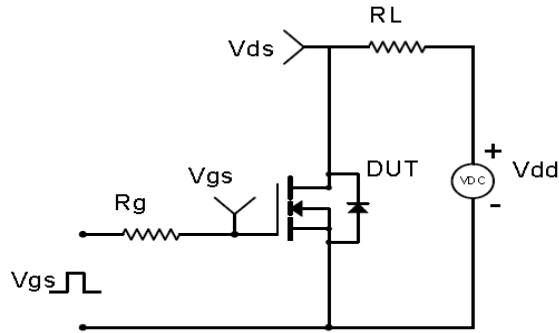

Fig.7 Gate Charge Characteristics

Fig.8 Capacitance Characteristics

Fig.9 Maximum Safe Operating Area

Fig.10 Maximum Drain Current vs. Case Temperature

Fig.11 Transient Thermal Response Curve

Test Circuit & Waveform

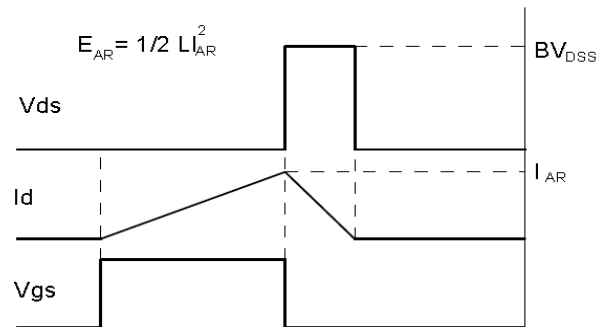
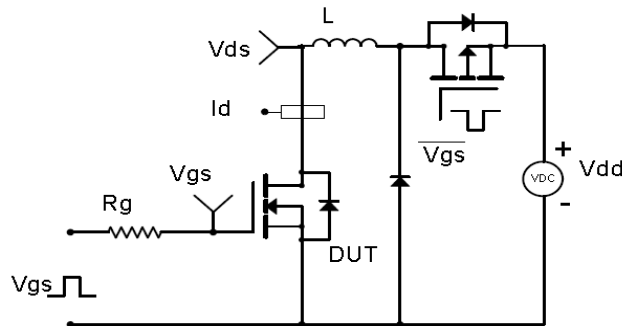
Gate Charge Test Circuit & Waveform



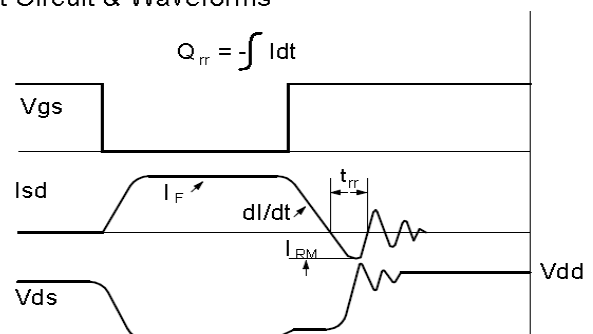
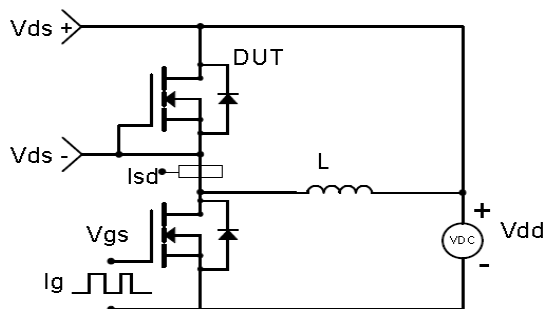
Resistive Switching Test Circuit & Waveforms

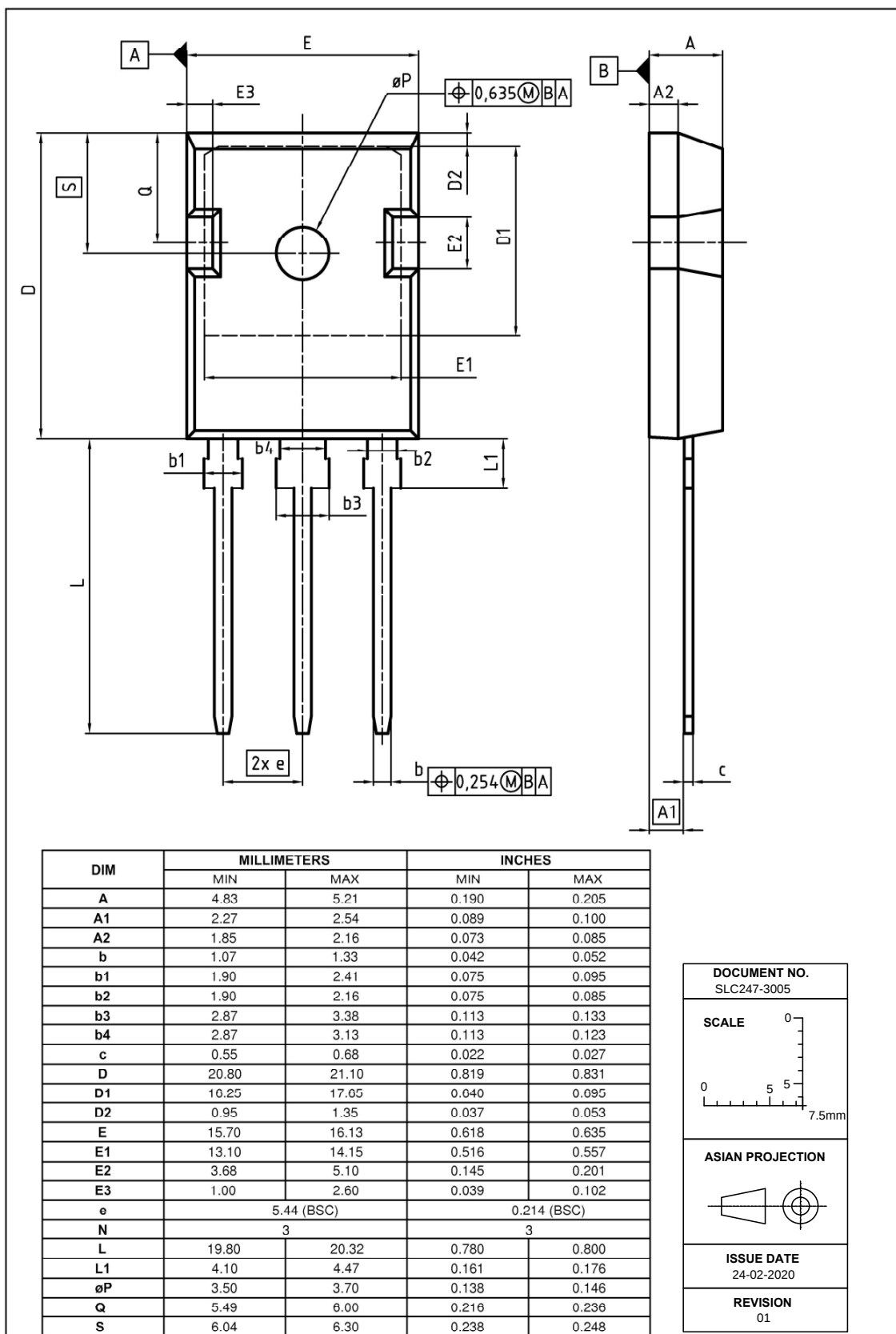


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



PackageOutlines-TO-247


Revision History

Revision	Date	Major Changes
1.0	2022-01-13	Release of formal version
2.0	2023-09-12	Update R _{DS(on)} and Performance Characteristics

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Scilicon Electric reserves the right to improve product design,function and reliability without notice.