

Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

Product Summary

V_{DS}	100V
$R_{DS(on)}$	2.4mΩ
I_D	272A

100% DVDS Tested

100% Avalanche Tested

Application

- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications


Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SFW024N100C3	024N100C3	TO-247	Tube	N/A	N/A	30pcs

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	100	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$ (Package limit)	I_D	272	A
	$T_C = 100^{\circ}\text{C}$ (Silicon limit)		177	
Pulsed Drain Current($T_C=25^{\circ}\text{C}$, t_p limited by T_{Jmax})		$I_{D,Pulse}$	840	A
Single Pulsed Avalanche Energy($L=0.5\text{mH}$, $R_g=25\Omega$)		E_{AS}	676	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_{tot}	223	W
Junction Temperature		T_J	-55~ +150	°C
Storage Temperature		T_{STG}	-55~ +150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance , junction – case	R_{thJC}	0.54	°C/W
Thermal resistance , junction – ambient(min. footprint)	R_{thJA}	60	°C/W

Electrical Characteristics ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
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Static Characteristics

Drain - Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$ $T_J = 25^{\circ}\text{C}$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 50A$	-	1.9	2.4	mΩ

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1\text{MHz}$		15098		pF
Output Capacitance	C_{oss}			1252		
Reverse Transfer Capacitance	C_{rss}			324		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$		1.6		Ω

Switching Characteristics

Total Gate Charge	Q_g	$V_{DS} = 50V, V_{GS} = 10V, I_D = 40A,$ $f = 1\text{MHz}$		165		nC
Gate-source Charge	Q_{gs}			67		
Gate-drain Charge	Q_{gd}			35		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V, V_{GS} = 10V,$ $R_G = 3\Omega$		37		ns
Turn-on Rise Time	t_r			112		
Turn-off Delay Time	$t_{d(off)}$			85		
Turn-off Fall Time	t_f			115		

Body Diode Characteristic

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_{SD} = 50A$			1.2	V
Body Diode Reverse Recovery Time	T_{rr}	$I_F = 30A, dI/dt = 500A/\mu s$		112		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 30A, dI/dt = 500A/\mu s$		323		nC

Typical Performance Characteristics

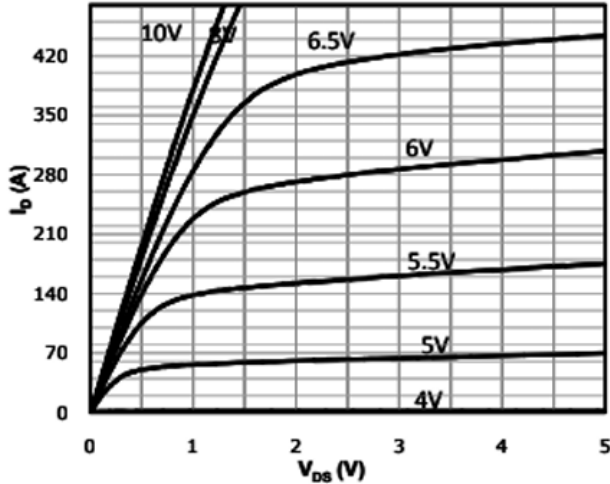
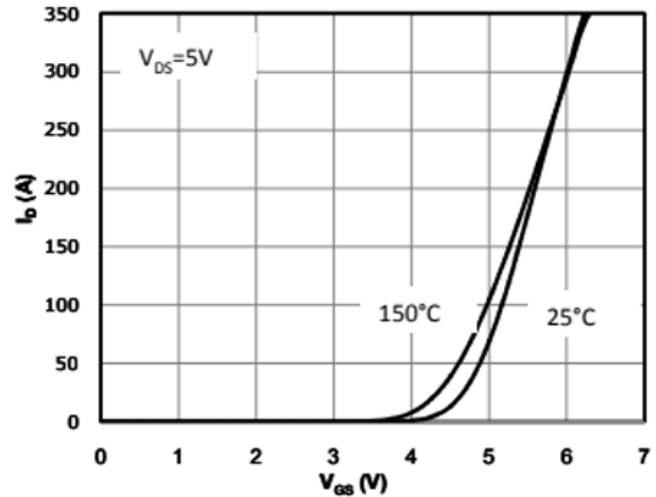
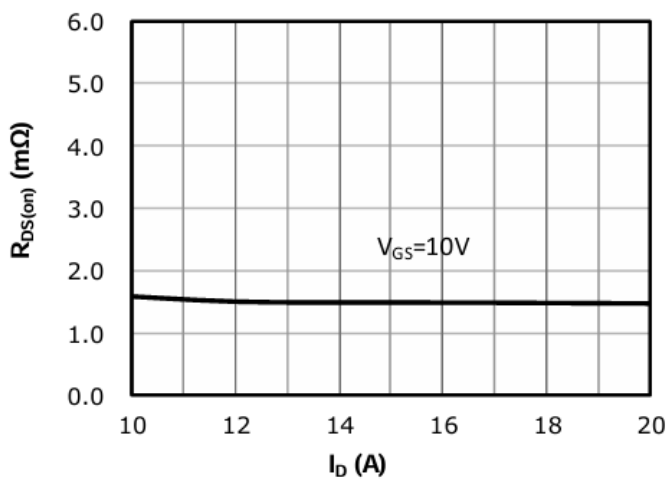
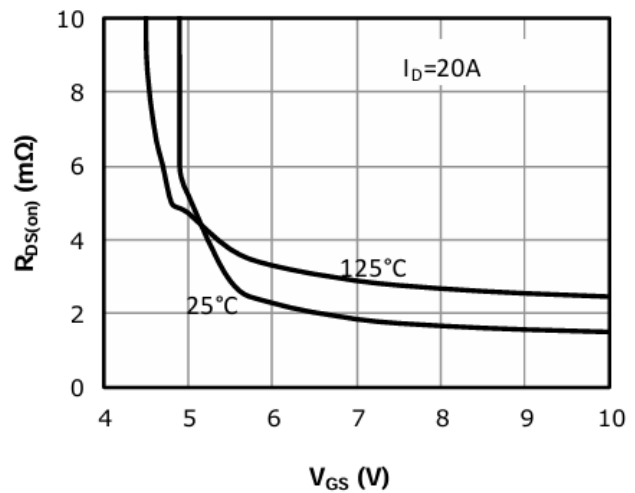
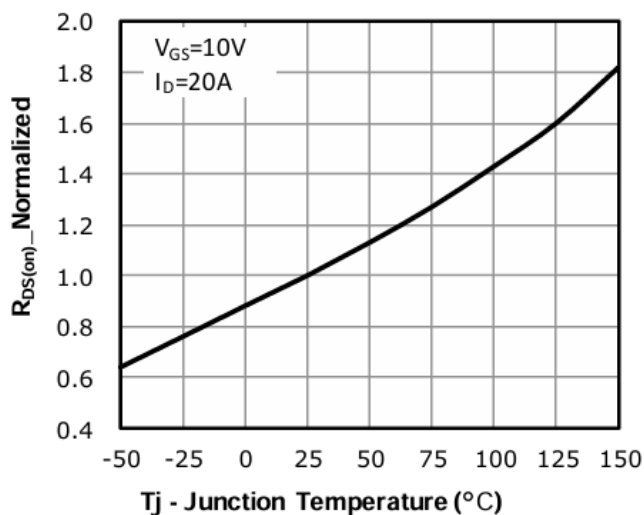
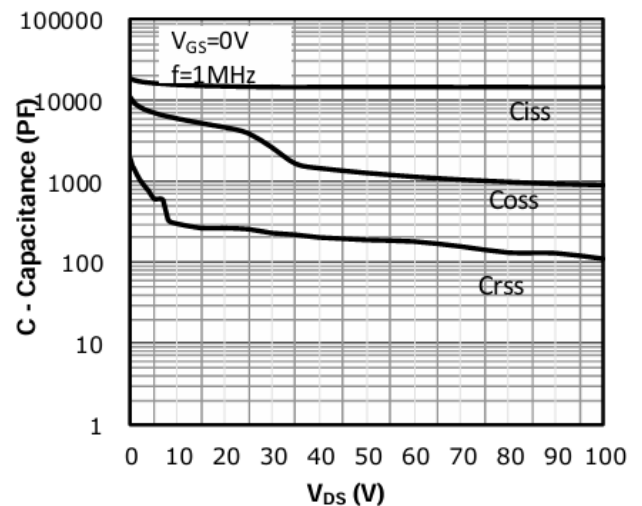
Fig 1: Output Characteristics

Fig 2: Transfer Characteristics

Fig 3: Rds(on) Vs Ids Characteristics ($T_c = 25^\circ\text{C}$)

Fig 4: Rds(on) vs Gate Voltage

Fig 5: Rds(on) vs. Temperature

Fig 6: Capacitance Characteristics


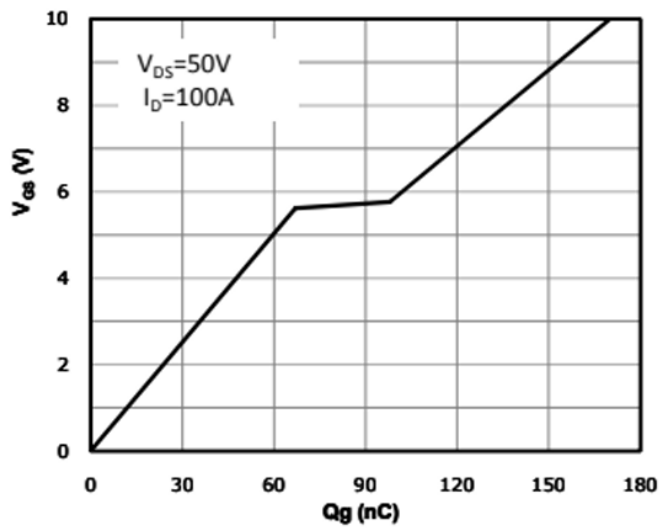
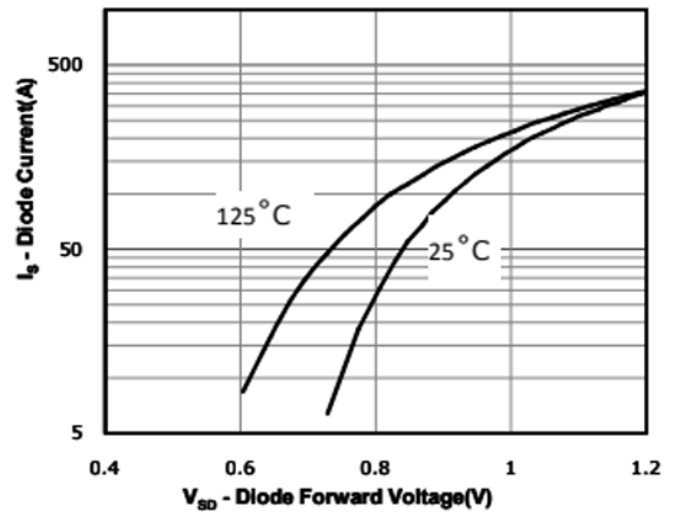
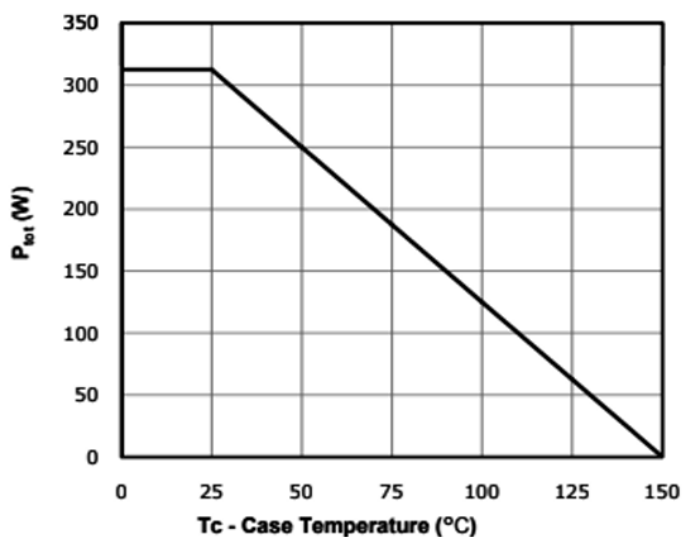
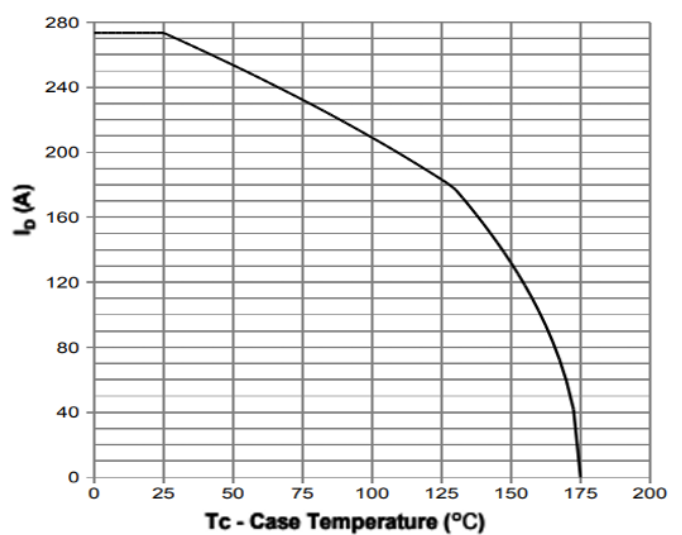
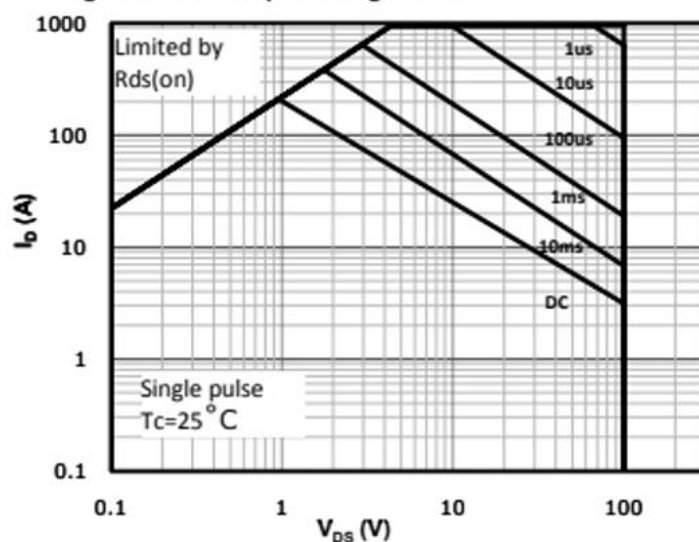
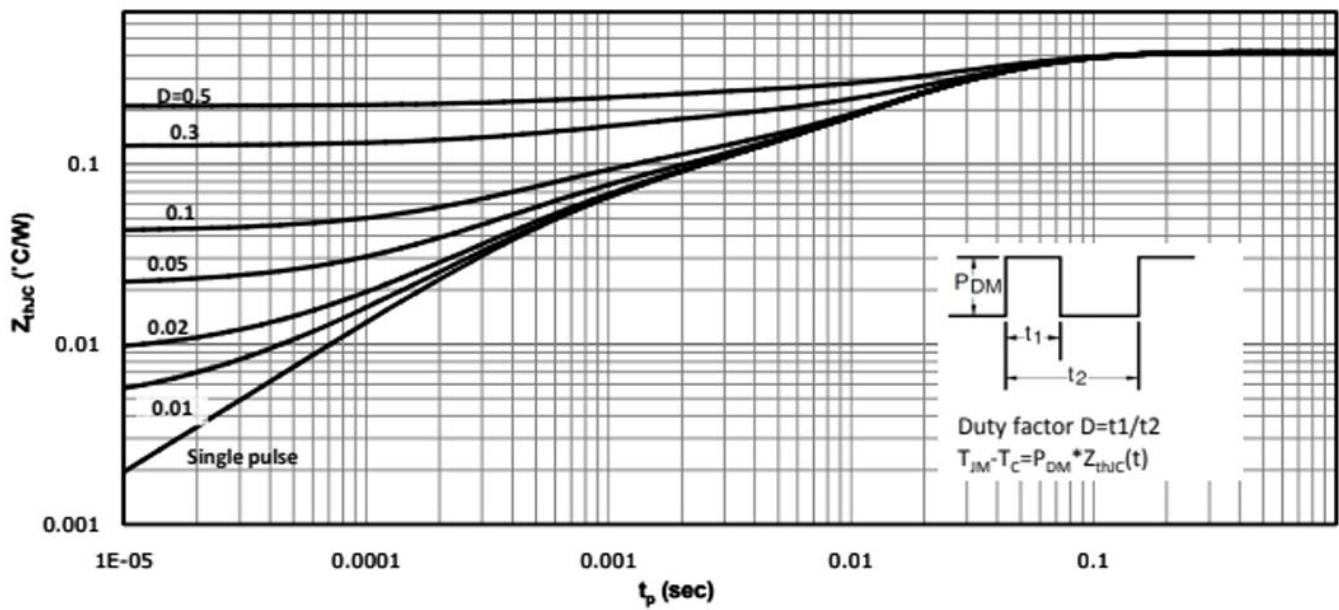
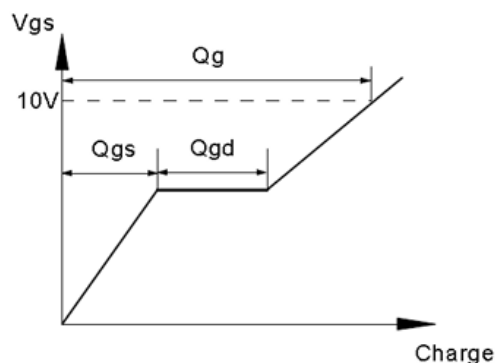
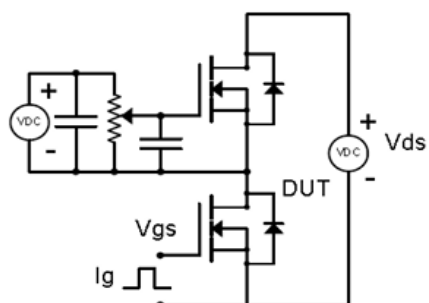
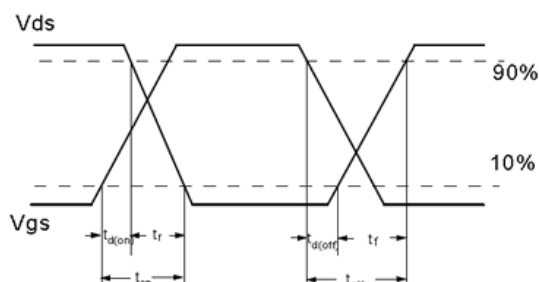
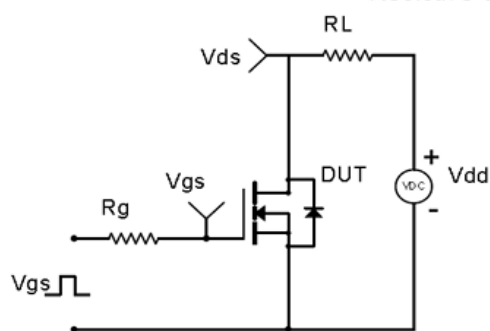
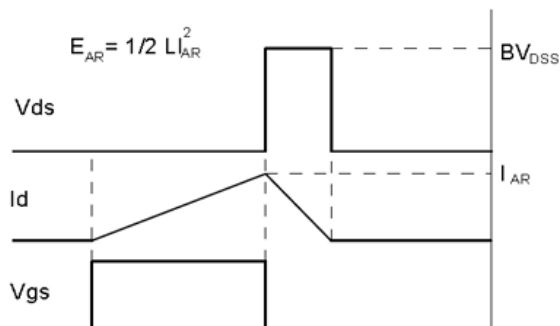
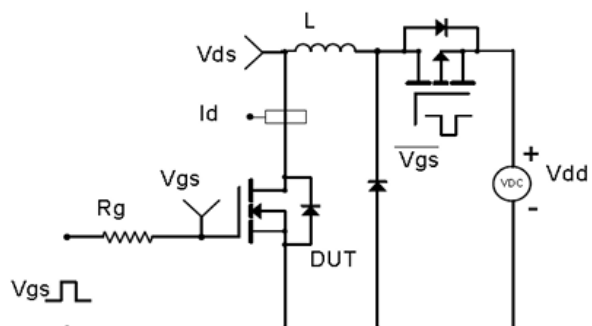
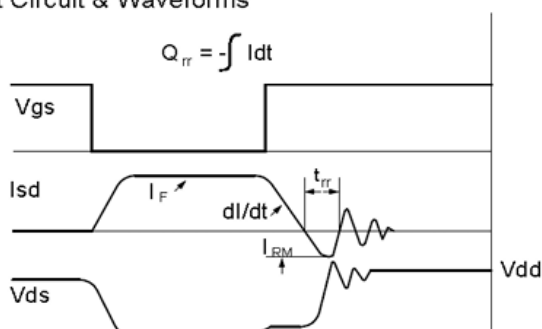
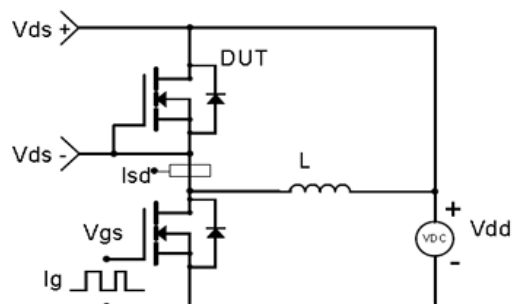
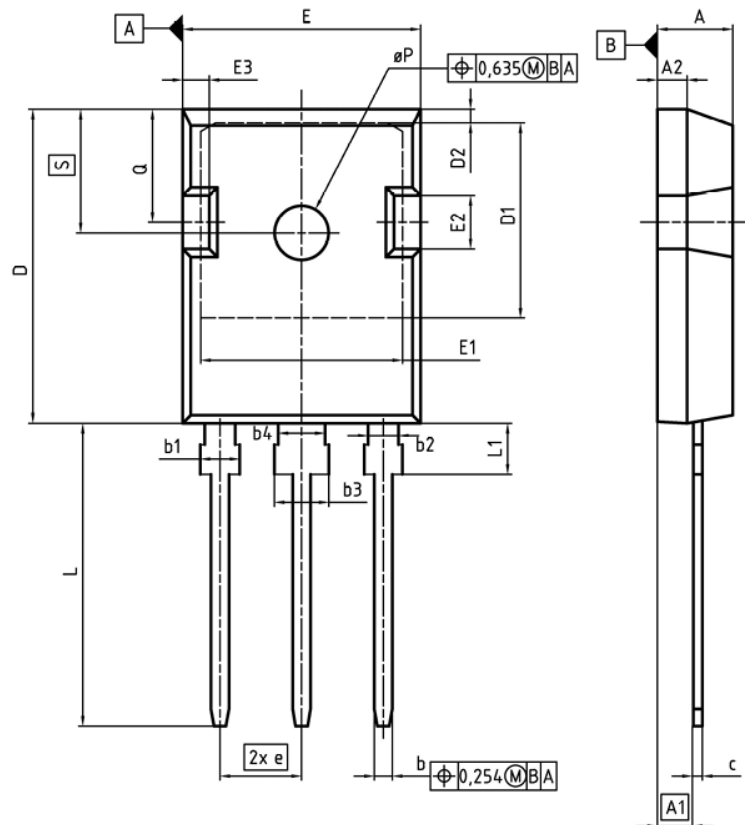
Fig 7: Gate Charge Characteristics

Fig 8: Body-diode Forward Characteristics

Fig 9: Power Dissipation

Fig 10: Drain Current Derating

Fig 11: Safe Operating Area


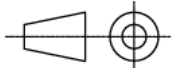
Fig 12: Max. Transient Thermal Impedance


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


Package Outline: TO-247



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.27	2.54	0.089	0.100
A2	1.85	2.16	0.073	0.085
b	1.07	1.33	0.042	0.052
b1	1.90	2.41	0.075	0.095
b2	1.90	2.16	0.075	0.085
b3	2.87	3.38	0.113	0.133
b4	2.87	3.13	0.113	0.123
c	0.55	0.68	0.022	0.027
D	20.80	21.10	0.819	0.831
D1	16.25	17.65	0.640	0.695
D2	0.95	1.35	0.037	0.053
E	15.70	16.13	0.618	0.635
E1	13.10	14.15	0.516	0.557
E2	3.68	5.10	0.145	0.201
E3	1.00	2.60	0.039	0.102
e	5.44 (BSC)		0.214 (BSC)	
N	3		3	
L	19.80	20.32	0.780	0.800
L1	4.10	4.47	0.161	0.176
Q	3.50	3.70	0.138	0.146
S	6.04	6.30	0.238	0.248

DOCUMENT NO. SLC247-3005
SCALE 0 5 5 7.5mm
ASIAN PROJECTION 
ISSUE DATE 24-02-2020
REVISION 01

Revision History

Revision	Date	Major Changes
1.0	2024-6-12	Release of provisional version

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.