

Features

- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

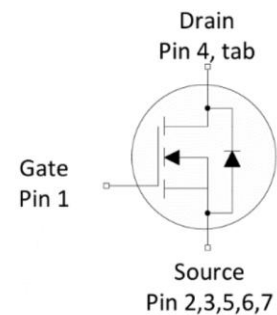
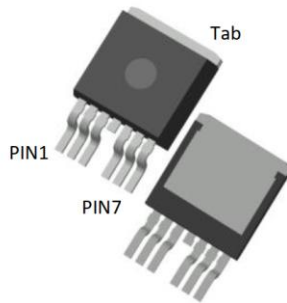
Application

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

Product Summary

Package	TO-263-7
V_{DS}	100V
$R_{DS(on)}@V_{GS}=10V$	2.5mΩ
I_D	210A

Package Marking and Ordering Information



Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LR030N10SM0	TO-263-7	LR030N10SM0	330*28.5mm	24mm	Reel&Tape	800

Maximum Ratings ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous drain current $T_c=25^{\circ}\text{C}$ (Silicon limit) $T_c=100^{\circ}\text{C}$ (Silicon limit)	I_D	210 131	A
Pulsed Drain Current	I_{DM}	840	A
Maximum Power Dissipation	P_d	223	W
Single pulse avalanche energy	E_{AS}	1296	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}\text{C}$

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	0.56	°C/W
Thermal Resistance,Junction-to-Ambient	R_{thJA}	62	

Electrical Characteristics (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	min	typ	max	Unit
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Static Characteristic

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	2.9	4	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=50A, V_{GS}=10V$	-	2.5	3.0	mΩ

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V,$ $f=1MHz$	-	7202	-	pF
Output Capacitance	C_{oss}		-	1019	-	
Reverse Transfer Capacitance	C_{rss}		-	47	-	
Gate resistance	R_g	$f=1MHz$	-	0.8	-	Ω
Gate Total Charge	Q_G	$V_{DS}=50V, I_D=90A,$ $V_{GS}=10V$	-	124	-	nC
Gate-Source charge	Q_{gs}		-	51	-	
Gate-Drain charge	Q_{gd}		-	33	-	
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=50V,$ $R_G=3\Omega$	-	27	-	ns
Rise time	t_r		-	79	-	
Turn-off delay time	$t_{d(off)}$		-	73	-	
Fall time	t_f		-	59	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=90A$	-	-	1.4	v
Reverse Recovery Time	t_{rr}	$I_F = 90A$ $di/dt = 100A/\mu s$	-	69	-	ns
Reverse Recovery Charge	Q_{rr}		-	148	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

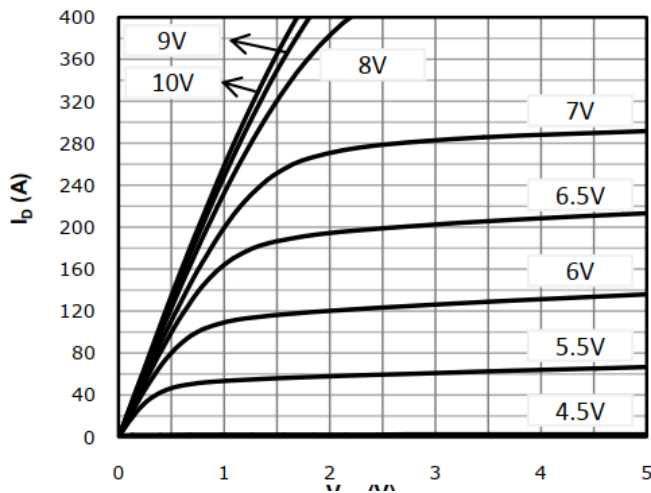


Fig 2: Transfer Characteristics

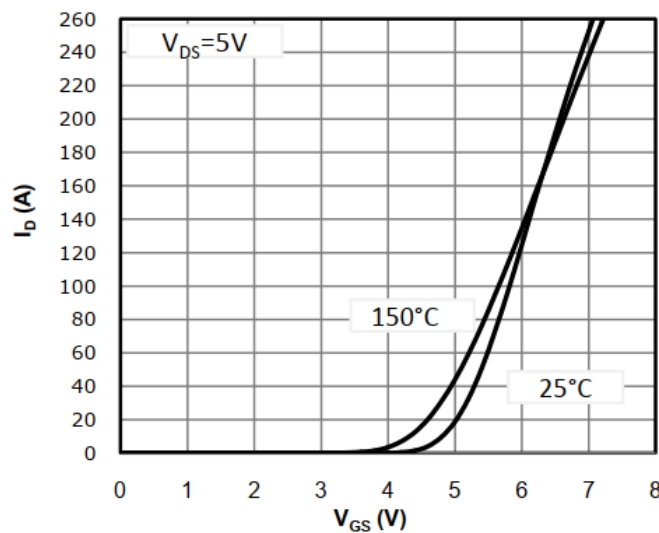


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

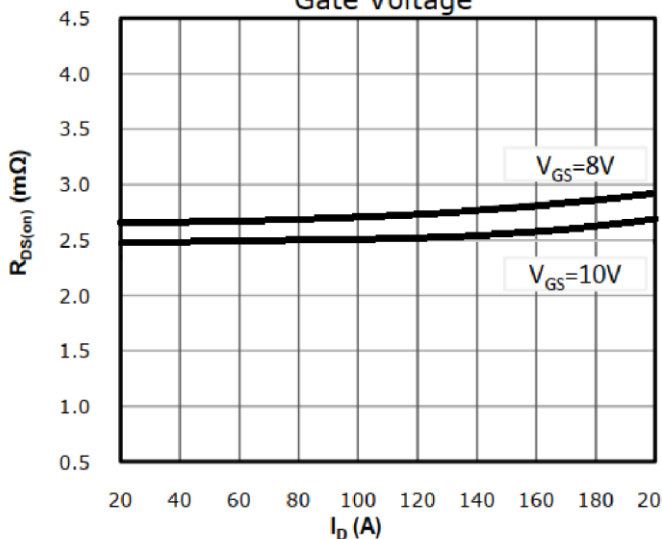


Fig 4: $R_{DS(on)}$ vs Gate Voltage

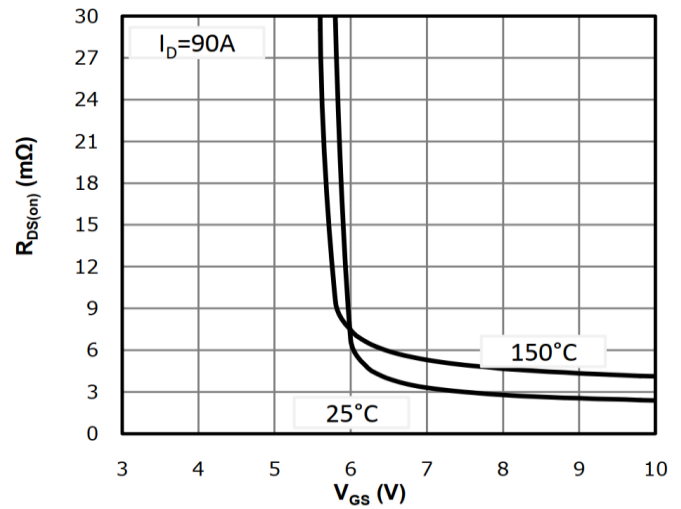


Fig 5: $R_{DS(on)}$ vs. Temperature

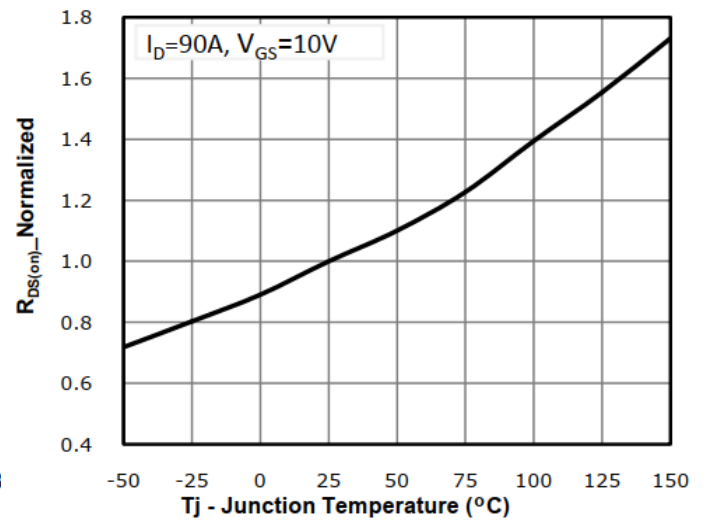


Fig 6: $V_{GS(th)}$ vs. Temperature

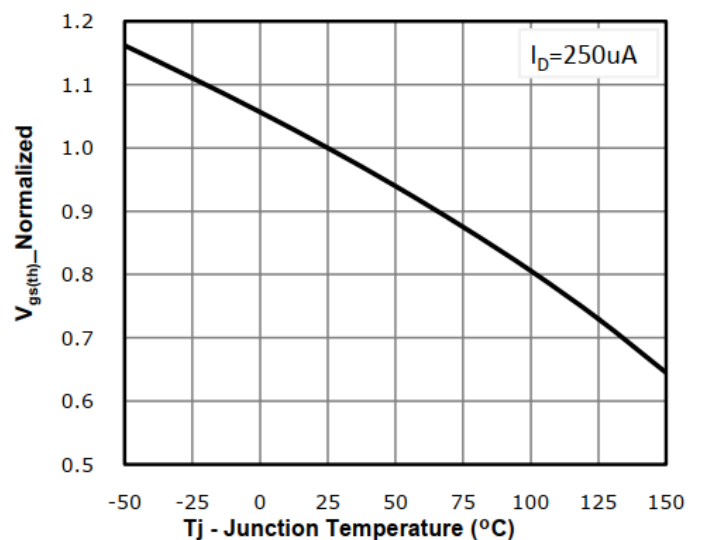


Fig 7: BVdss vs. Temperature

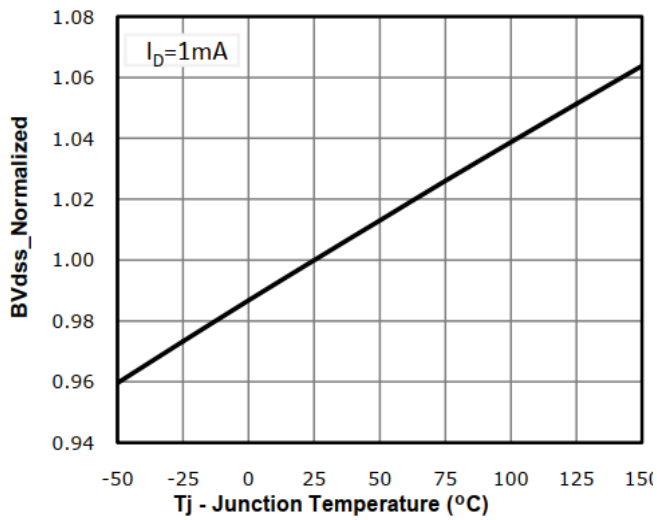


Fig 10: Body-diode Forward Characteristics

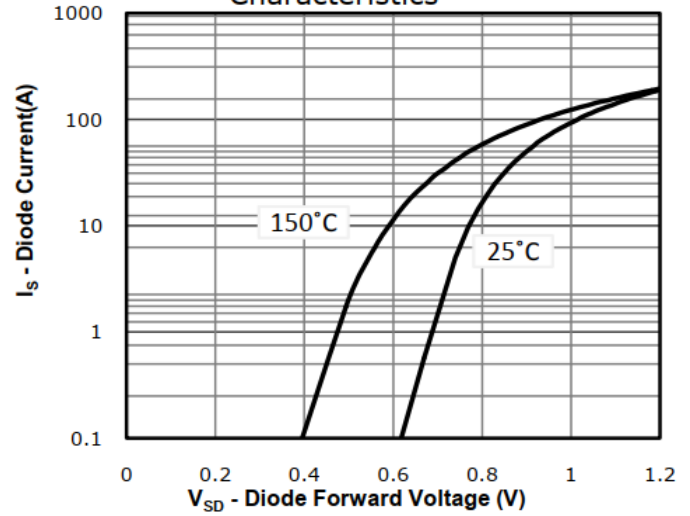


Fig 8: Capacitance Characteristics

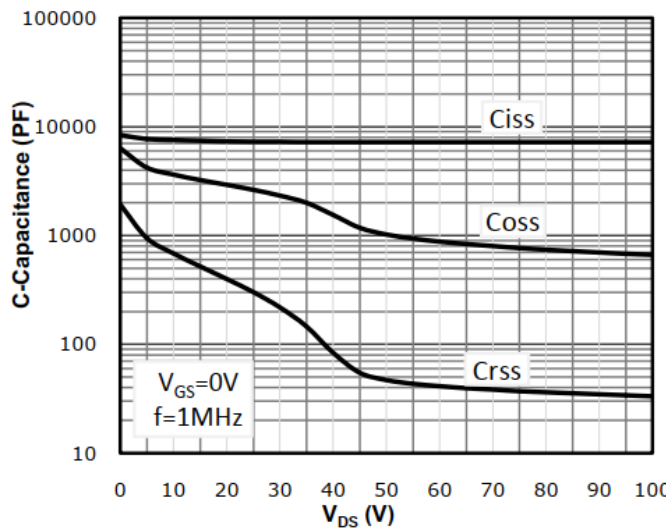


Fig 11: Power Dissipation

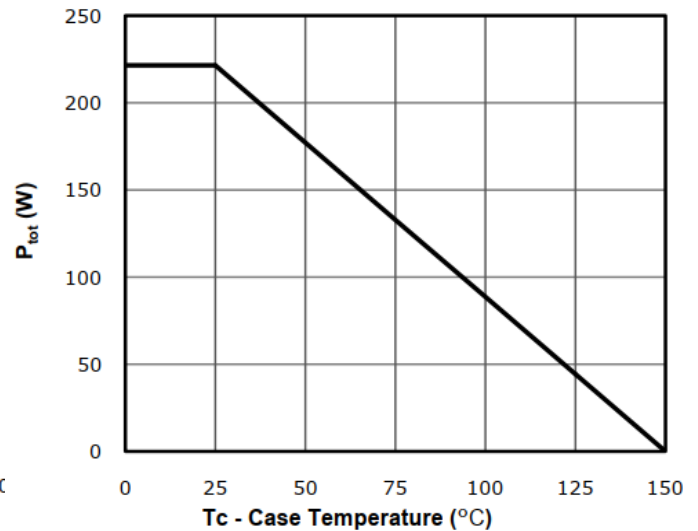


Fig 9: Gate Charge Characteristics

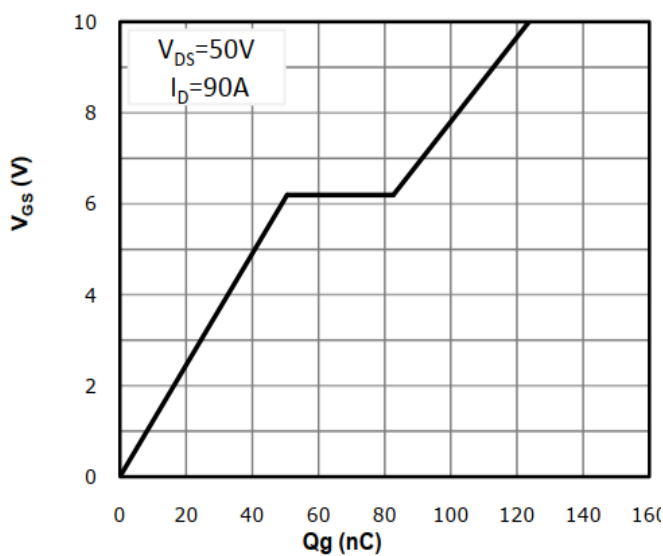


Fig 12: Drain Current Derating

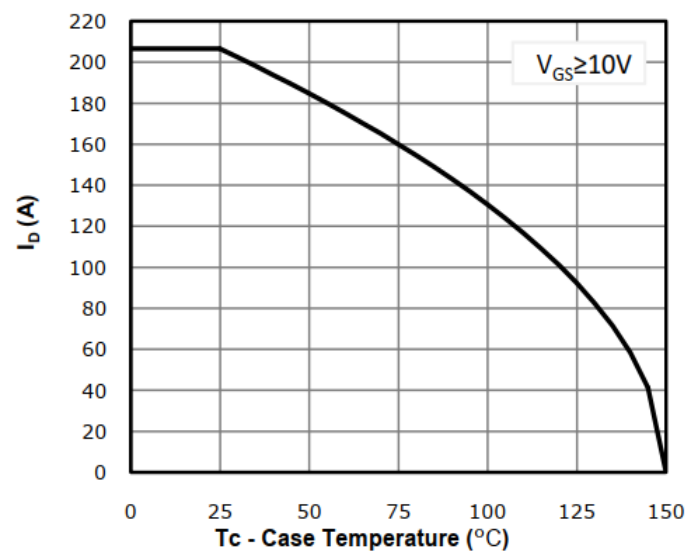


Fig 13: Safe Operating Area

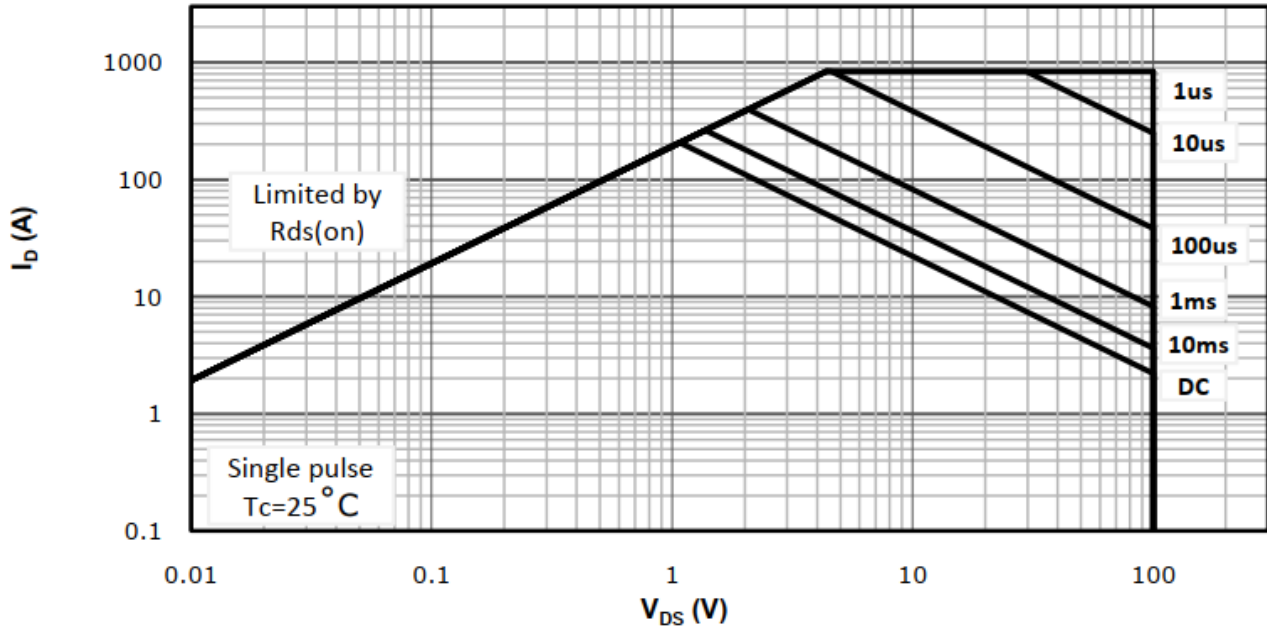
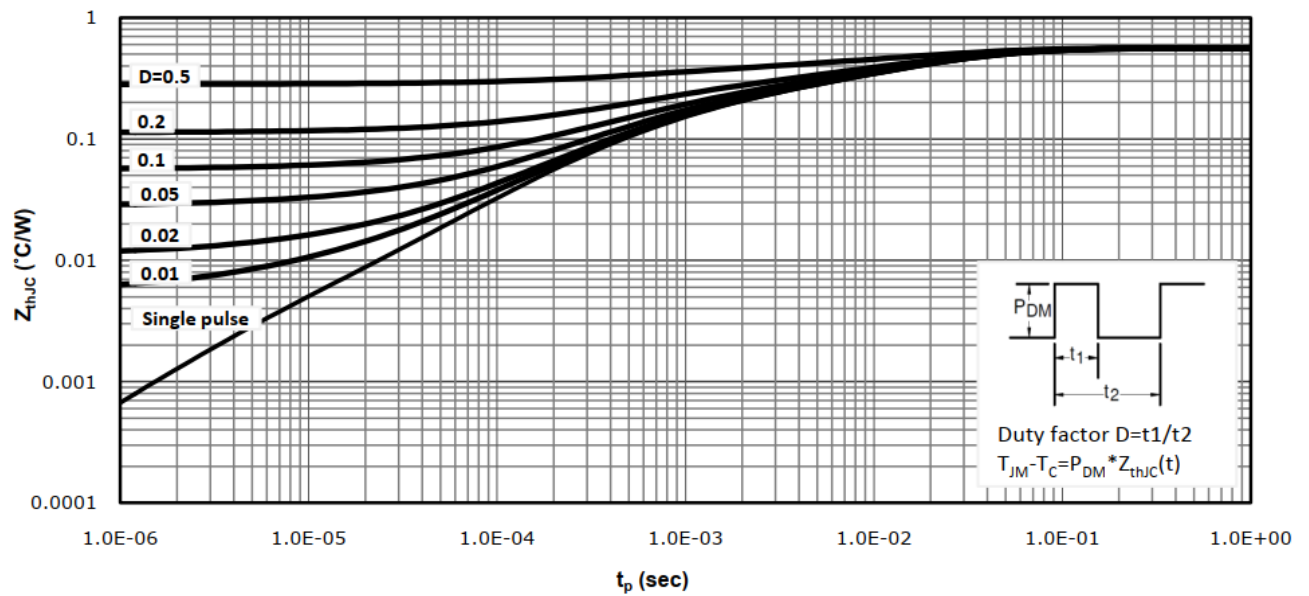
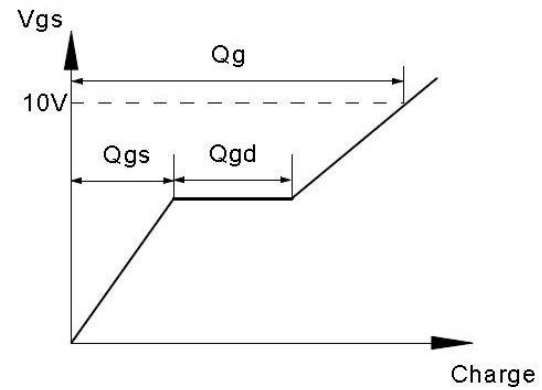
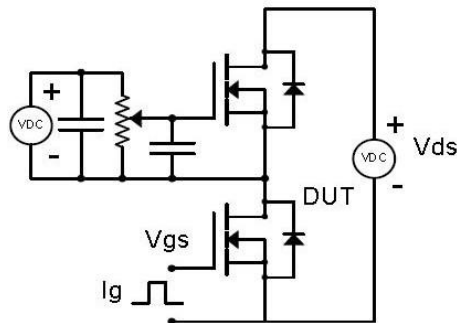


Fig 14: Max. Transient Thermal Impedance

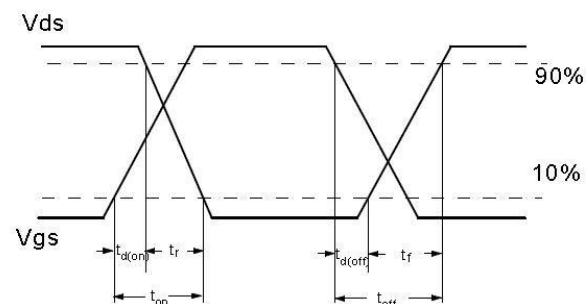
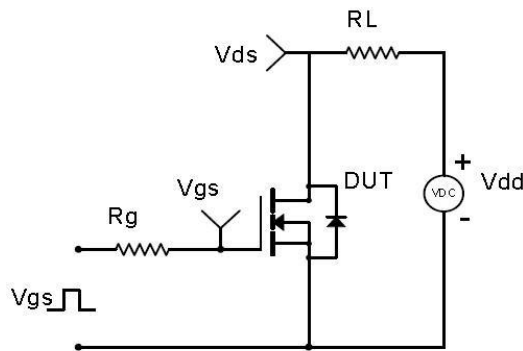


S Test Circuit & Waveform

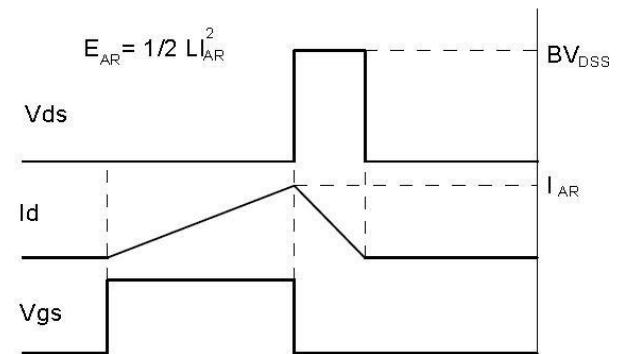
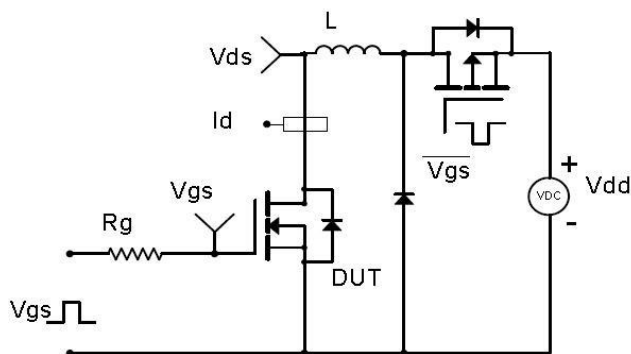
Gate Charge Test Circuit & Waveform



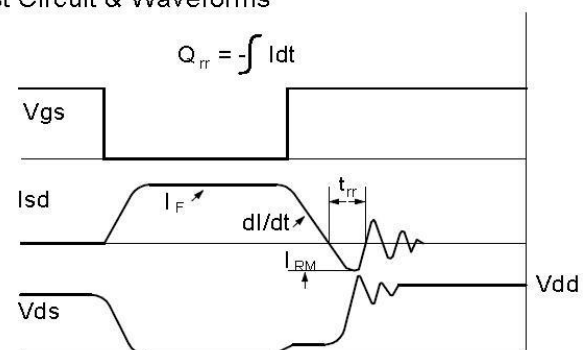
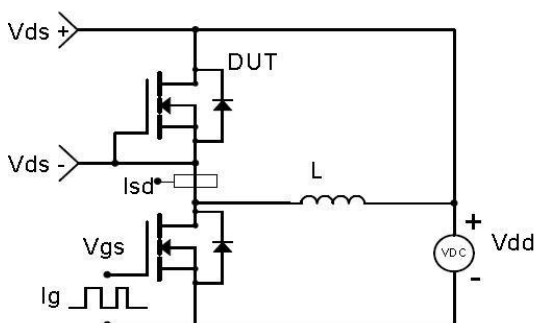
Resistive Switching Test Circuit & Waveforms

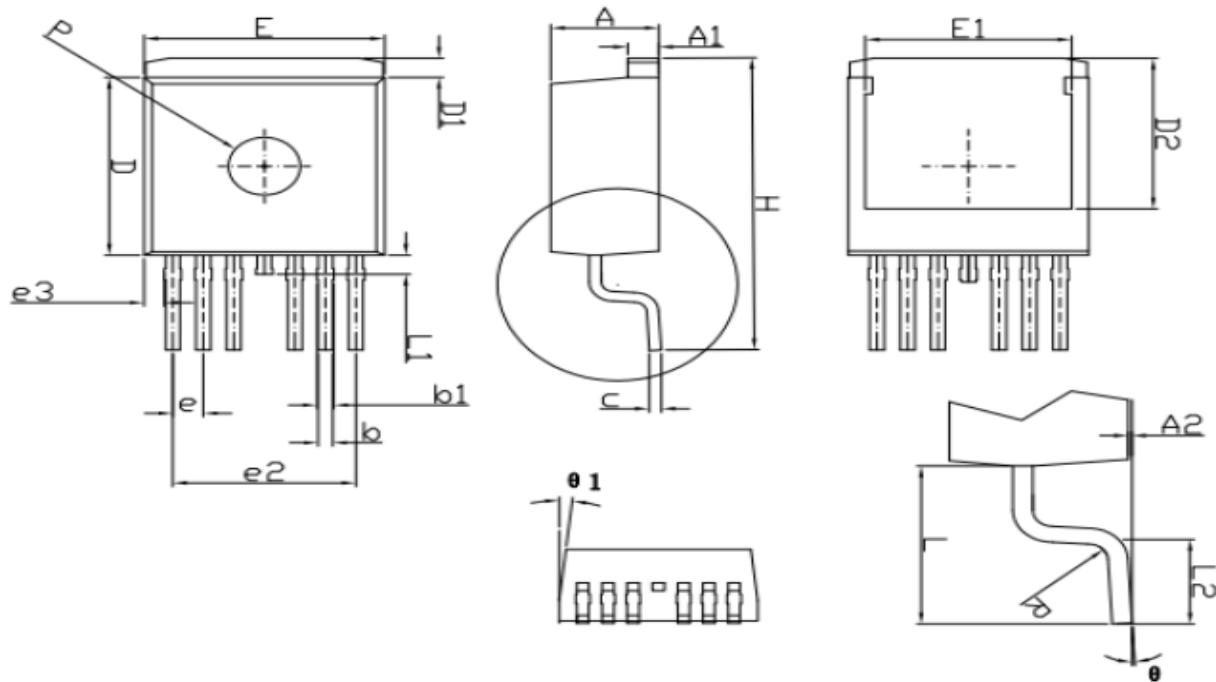
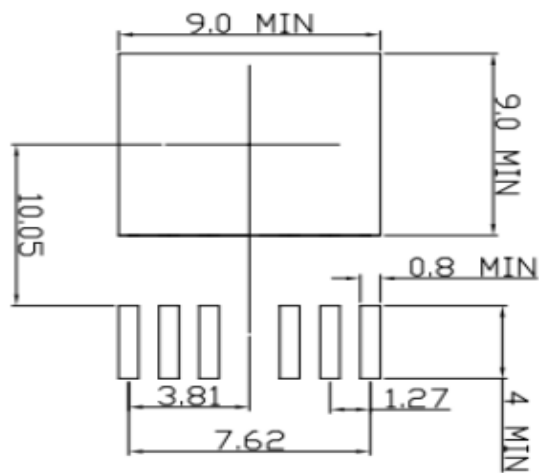


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-263-7

RECOMMENDED LAND PATTERN


UNIT: mm

	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.20	1.30	1.40
A2	0.05	0.15	0.30
b	0.50	0.60	0.70
b1	0.50	0.70	0.90
c	0.40	0.50	0.60
D	9.05	9.25	9.45
D1	0.70	1.00	1.30
D2	7.35	7.85	8.35
E	9.80	10.00	10.20
E1	8.10	8.60	9.10
e	1.07	1.27	1.47
e2	7.32	7.62	7.92
e3	0.64	0.84	1.04
H	14.65	15.15	15.65
L	4.47	4.97	5.47
L1	0.90	1.20	1.50
L2	2.20	2.50	2.80
θ	0°	3°	8°
θ1	0°	6°	10°
ΦP	2.70	3.00	3.30

Revision History:

Revision	Date	Major changes
1.0	2024/3/25	Release of Preliminary version.
2.0	2025/8/1	Release of Official version.