RST018N10SM10

N-MOSFET TOLL 100V, 320A, 1.5mΩ

Features

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

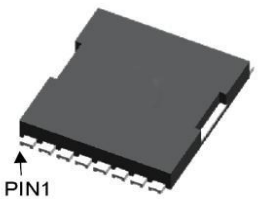
Application

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

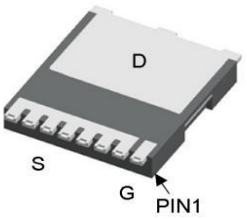
Product Summary

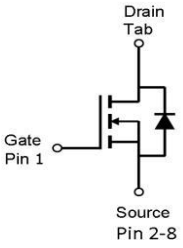
	TOLL
V_{DS}	100V
$R_{DS(on)@VGS=10V}$	1.5mΩ
I_D	320A

TOLL Top View



TOLL Bottom View





Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
RST018N10SM10	TOLL	LR018N10SM10	330*28.5mm	24mm	Reel&Tape	2000

Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	100	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 320 260 208	A
Pulsed drain current, T_C = 25°C	$I_{D\ pulse}$	1200	
Avalanche energy, single pulse (L=0.5mH,Rg=25Ω)	E_{AS}	1936	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_D	250	W
Operating junction and storage temperature	T_j , T_{stg}	-55~150	℃

Thermal Resistance

	Symbol	TYP	MAX	Unit
Thermal resistance, junction – case	R_{thJC}	0.35	0.5	℃/W
Thermal resistance, junction – ambient	R_{thJA}	30	40	

Electrical Characteristic, at Tj = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA T_j=25°C	2	3	4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V,V_{GS}=0 V T_j=25°C	-	-	1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=30A, T_j=25°C	-	1.5	1.8	mΩ
Transconductance	g_{fs}	V_{DS}=5V,I_D=50A	-	238	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	10120	-	pF
Output Capacitance	C_{oss}		-	1360	-	
Reverse Transfer Capacitance	C_{rss}		-	50	-	
Gate Total Charge	Q_G	V_{GS}=10V, V_{DS}=50V, I_D=50A	-	175	-	nC
Gate-Source charge	Q_{gs}		-	50	-	
Gate-Drain charge	Q_{gd}		-	53	-	
Turn-on delay time	$t_{d(on)}$	T_j=25°C, V_{GS}=10V, V_{DS}=50V, R_L=6Ω	-	85	-	ns
Rise time	t_r		-	138	-	
Turn-off delay time	$t_{d(off)}$		-	93	-	
Fall time	t_f		-	98	-	
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1.7	-	Ω

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=50A	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=30A, dI/dt=500A/μs	-	47	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=30A, dI/dt=100A/μs	-	388	-	nC

Typical Performance Characteristics

Fig.1 Typ. transfer characteristics

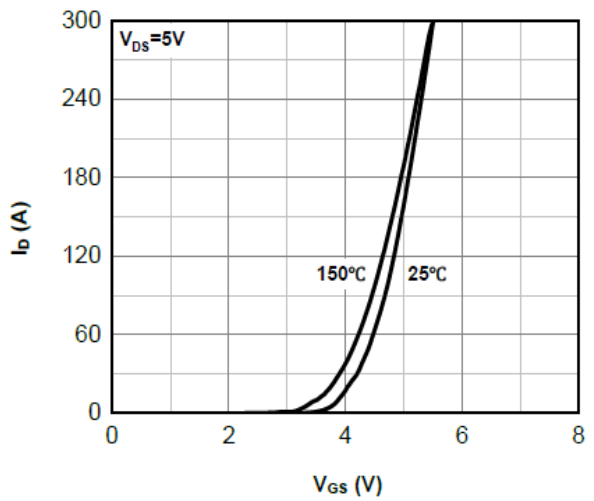


Fig.2 Typ. output characteristics

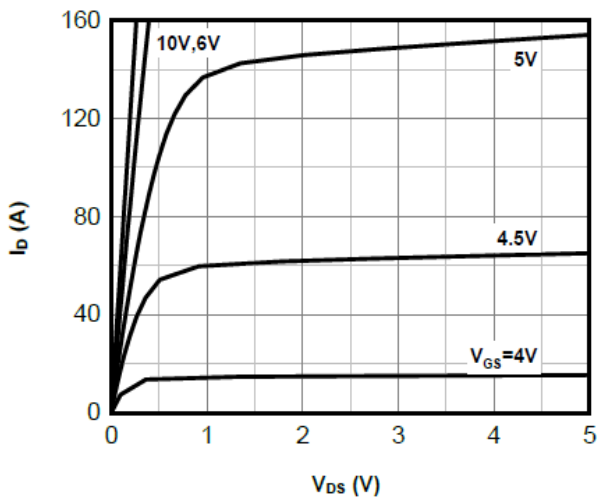


Fig.3 Normalized on-resistance vs drain current

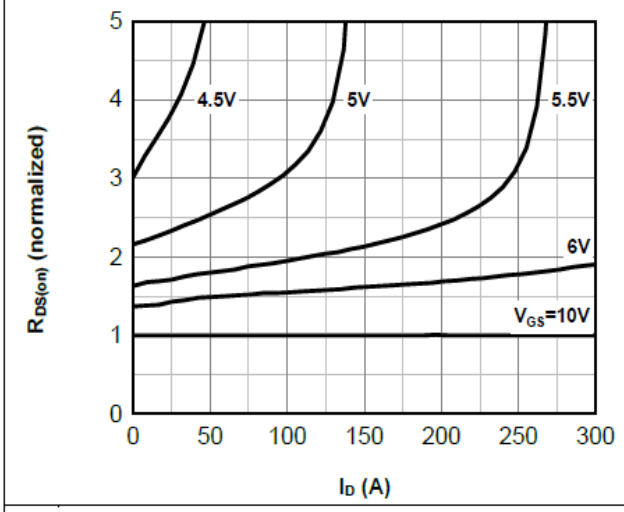


Fig.4 Typ. on-resistance vs gate-source voltage

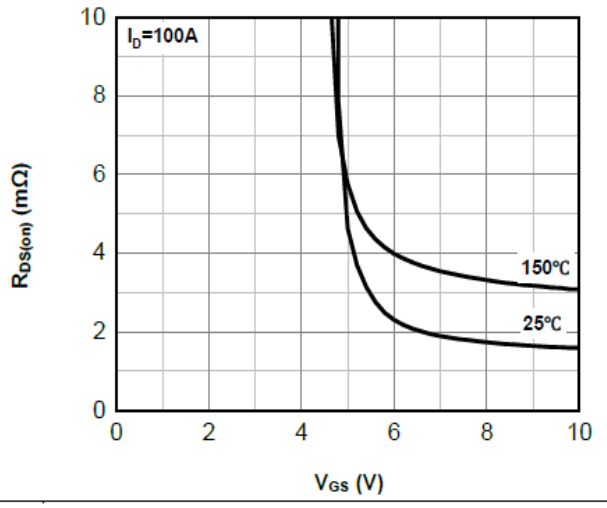


Fig.5 Normalized on-resistance vs junction temperature

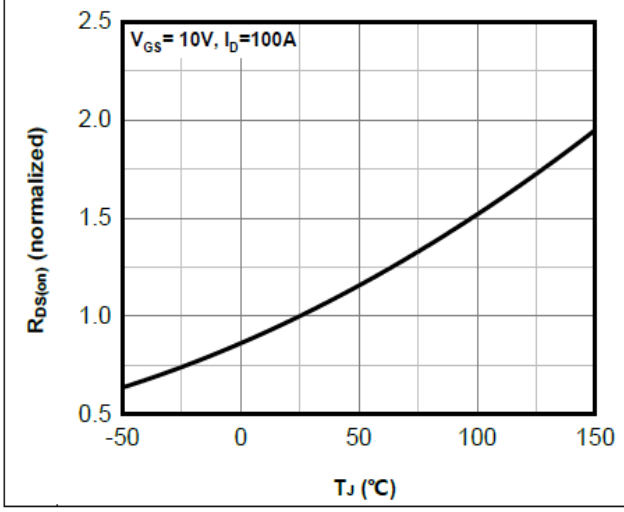


Fig.6 Typ. gate charge

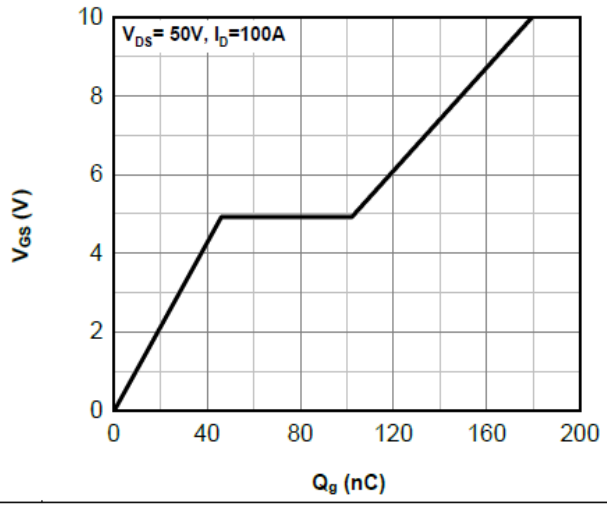


Fig.7 Typ. forward characteristics of body diode

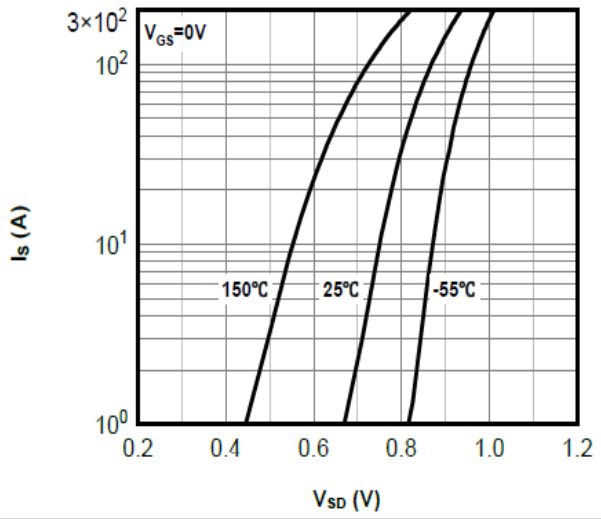


Fig.8 Safe operating area

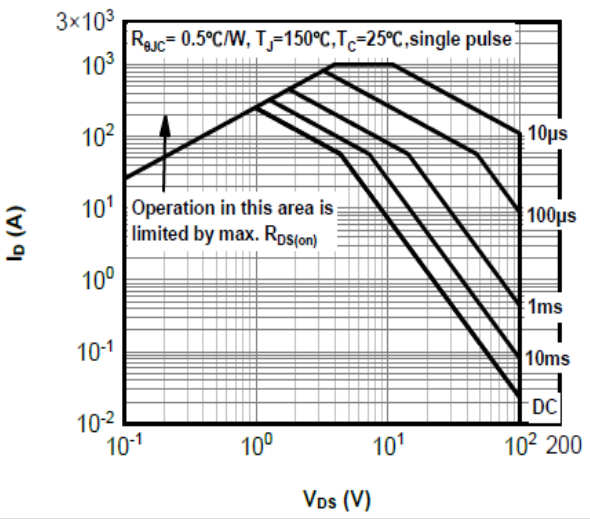


Fig.9 Typ. Capacitance

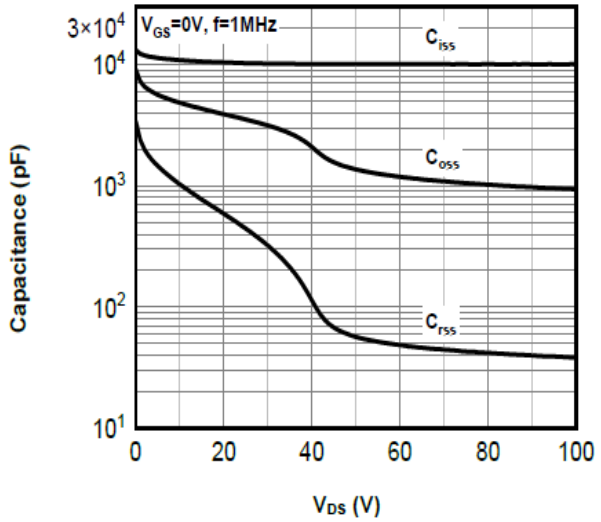


Fig.10 Single pulse maximum power dissipation

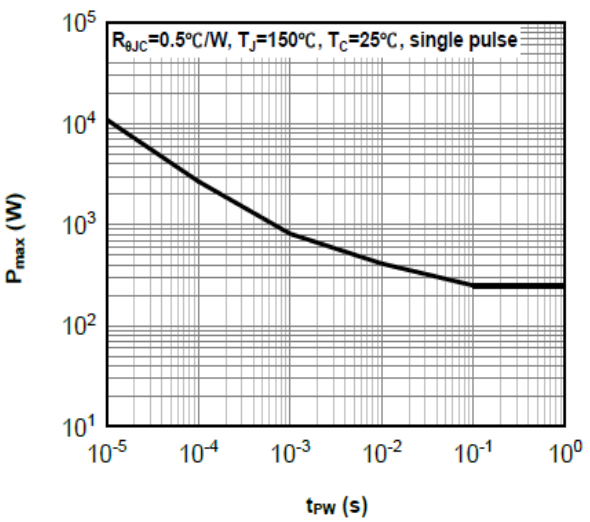


Fig.11 Max. power dissipation vs case temperature

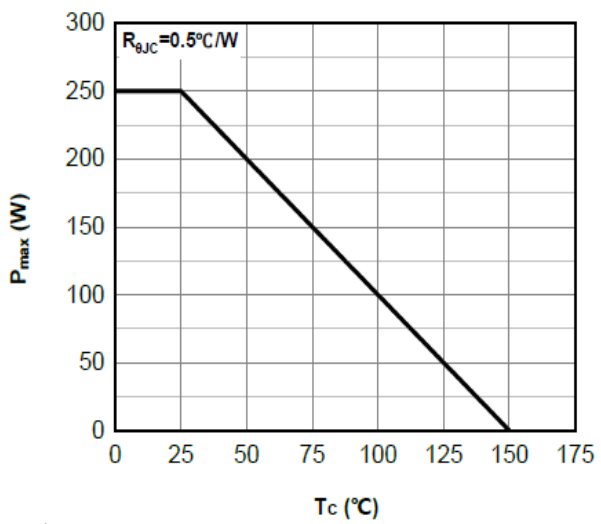


Fig.12 Max. continuous drain current vs case temperature

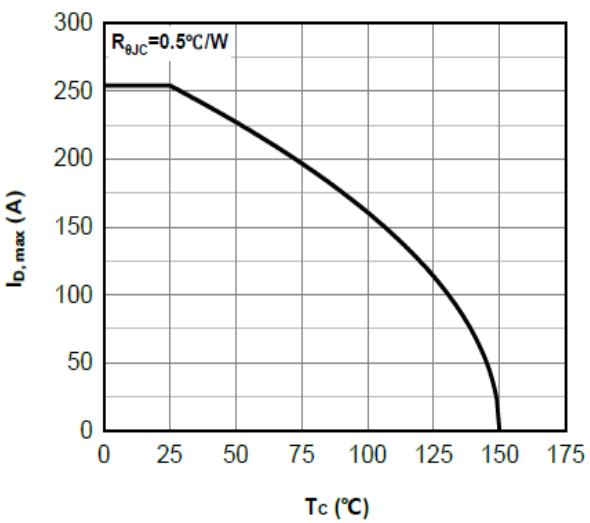


Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

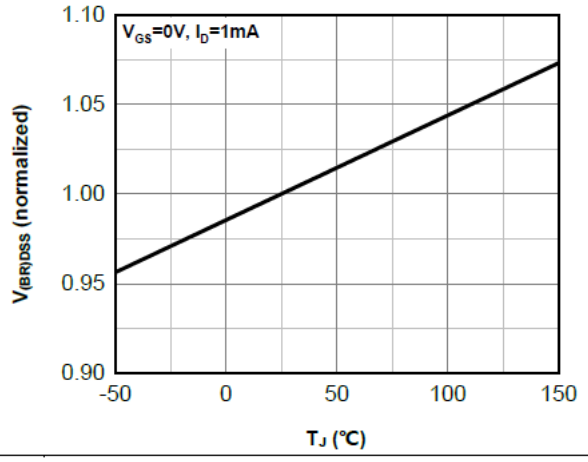


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

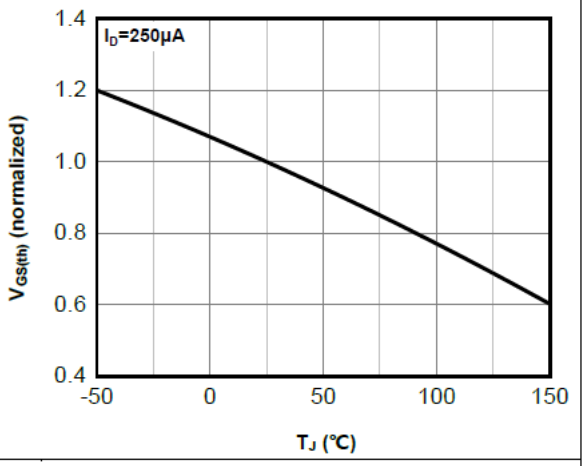
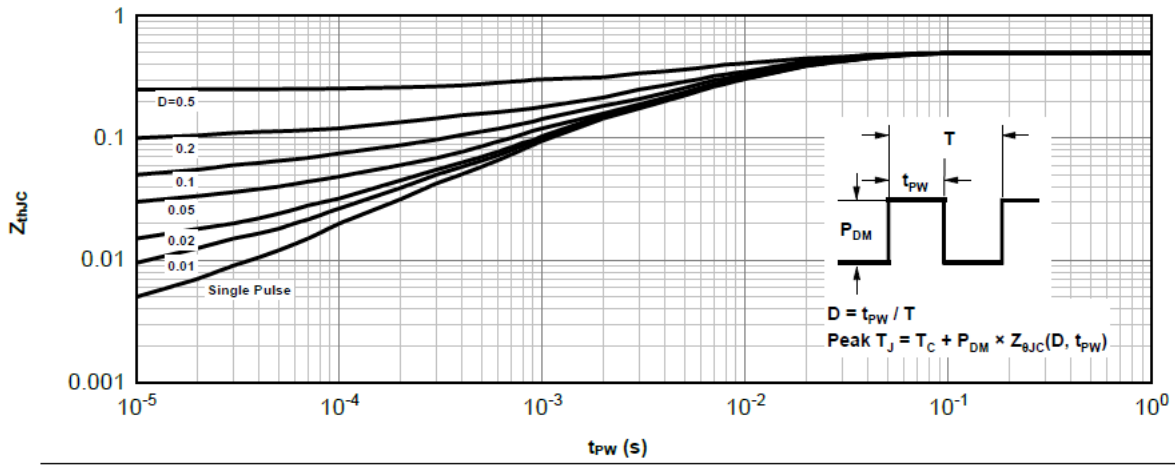
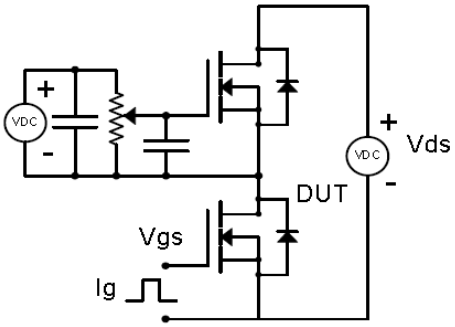


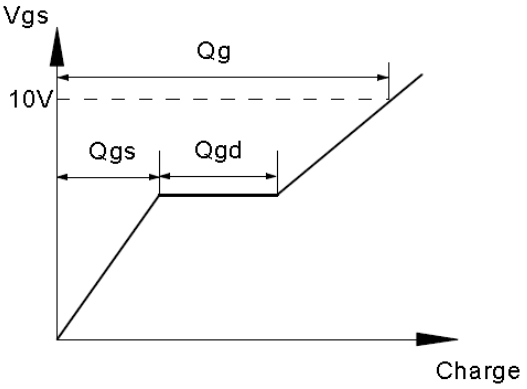
Fig.15 Transient thermal impedance from junction to case



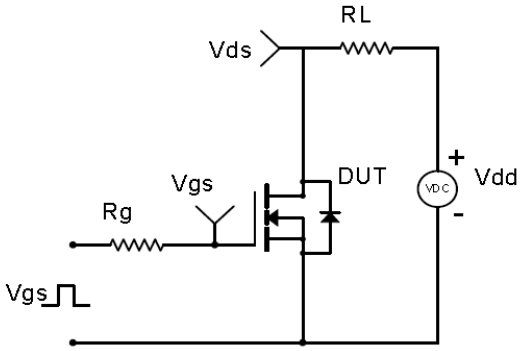
Test Circuit & Waveform

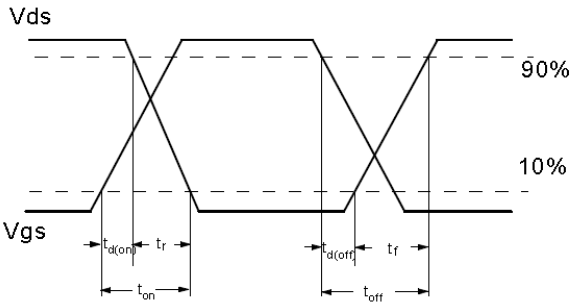
Gate Charge Test Circuit & Waveform



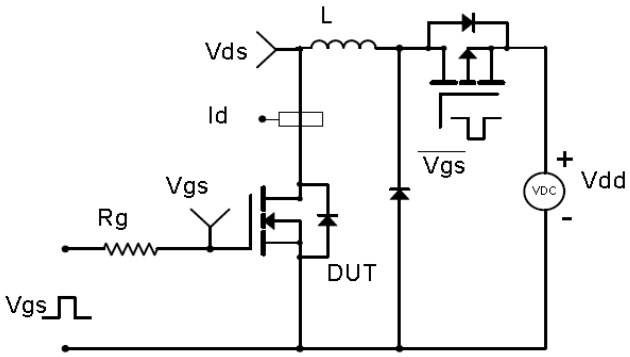


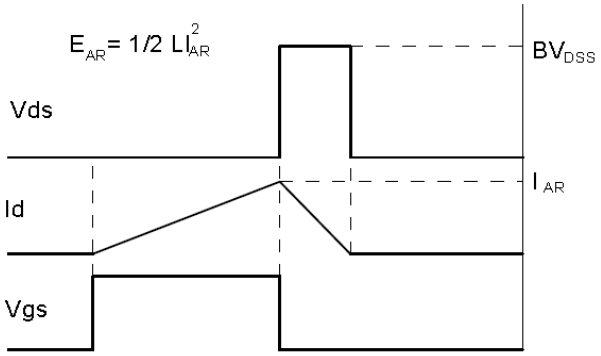
Resistive Switching Test Circuit & Waveforms



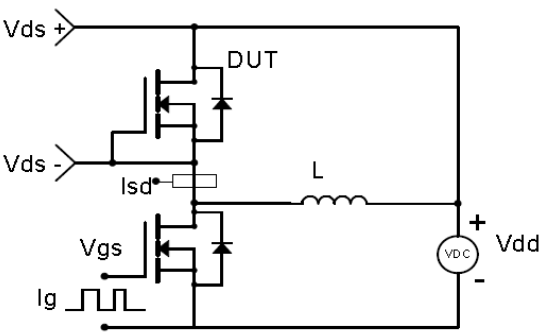


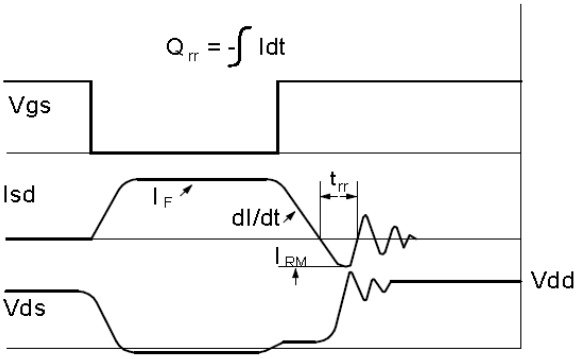
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



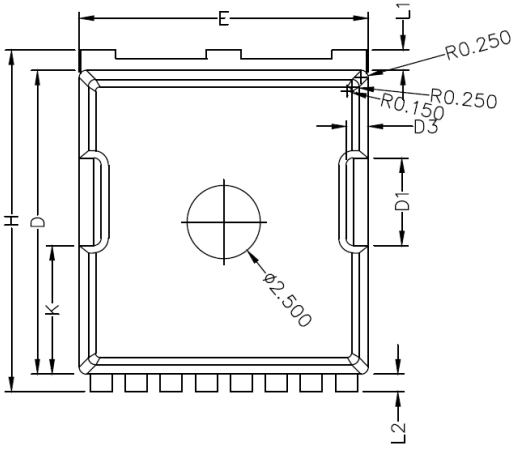


Diode Recovery Test Circuit & Waveforms

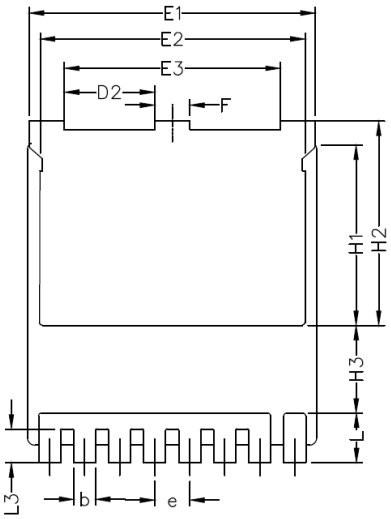




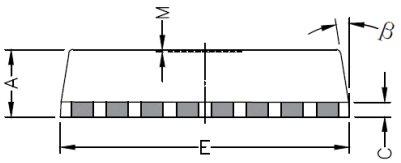
Package Outline:TOLL



Top View



Bottom View



Symbols	Millimeters		
	MIN.	NOM	MAX.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
C		0.508 REF	
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
D2	2.95	3.10	3.25
D3		0.75 REF	
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e		1.20 BSC	
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3		3.00 BSC	
L	1.55	1.70	1.85
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.00	1.15	1.30
M		0.08 REF	
β	8°	10°	12°
K	4.25	4.40	4.55