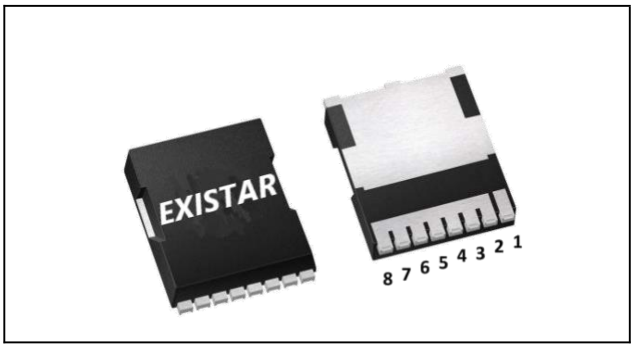
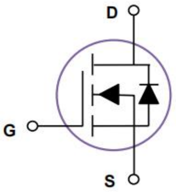
N-Channel 80V MOSFET

E080N1P5OH1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
80V	1.5 @ V_{GS} = 10V	325

TOLL-8





Pb-free
RoHS
COMPLIANT
HALOGEN
FREE

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Power switch
- PD charger
- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E080N1P5OH1	TOLL-8	E080N1P5OH1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TOLL-8	2000	1	2000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	80	V
ID, pulse	1230	A
RDS(ON), max @ VGS=10V	1.5	mΩ
Qg	175	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	80	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	325	A
	T_C=100°C		244	
Pulsed drain current		$I_{D,pulse}$	1230	
Avalanche energy, single pulse		E_{AS}	1681	mJ
Power dissipation	T_C=25°C	P_D	375	W
	T_A=25°C		2.9	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 175	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.4	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	43	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	80			V	V_{GS} = 0, I_D = 250 μA
Gate-source threshold voltage	$V_{GS(th)}$	2.5	3	3.5	V	V_{DS} = V_{GS}, I_D = 250 μA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS} = 80 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		1.2	1.5	mΩ	V_{GS} = 10 V, I_D = 80 A
Forward transconductance	gfs		80		S	V_{DS} = 5 V, I_D = 40 A
Gate resistance	Rg		2.4		Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		175		nC	V_{DS} = 40 V, I_D = 80 A, V_{GS} = 10 V
Gate-source charge	Qgs		55			
Gate-drain charge	Qgd		41			
Dynamic						
Turn-on delay time	$t_{d(on)}$		29		ns	V_{DS} = 40 V, I_D =80 A, V_{GS} = 10 V, R_{GEN} = 3 Ω
Rise time	t_r		107			
Turn-off delay time	$t_{d(off)}$		90			
Fall time	t_f		60			
Input capacitance	C_{iss}		11370		pF	V_{DS} = 40 V, V_{GS} = 0 V, f = 100kHz
Output capacitance	C_{oss}		2290			
Reverse transfer capacitance	C_{rss}		85			
Body Diode						
Diode forward voltage	V_{SD}		0.83	1	V	V_{GS} = 0 V, I_F = 80 A
Reverse recovery time	t_{rr}		84		ns	V_R= 60 V, I_S =80 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		127		nC	

Electrical Characteristics Diagrams

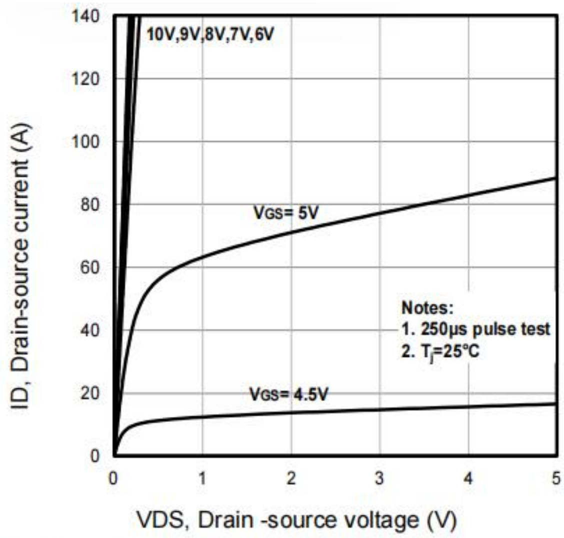


Fig1. Typical output characteristics

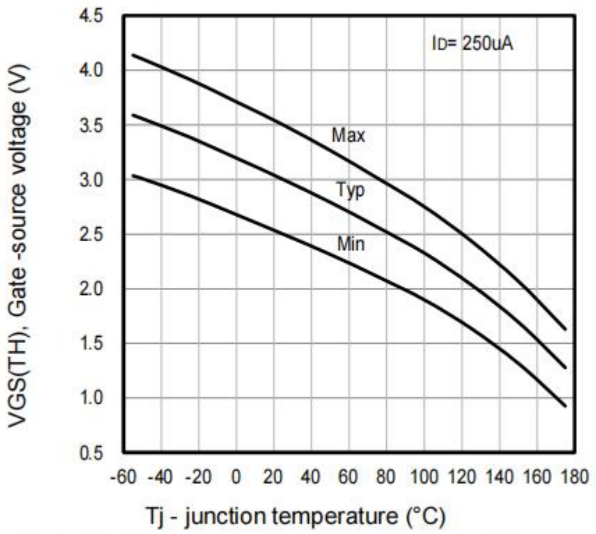


Fig2. Typical $V_{GS(TH)}$ gate -source voltage Vs. Tj

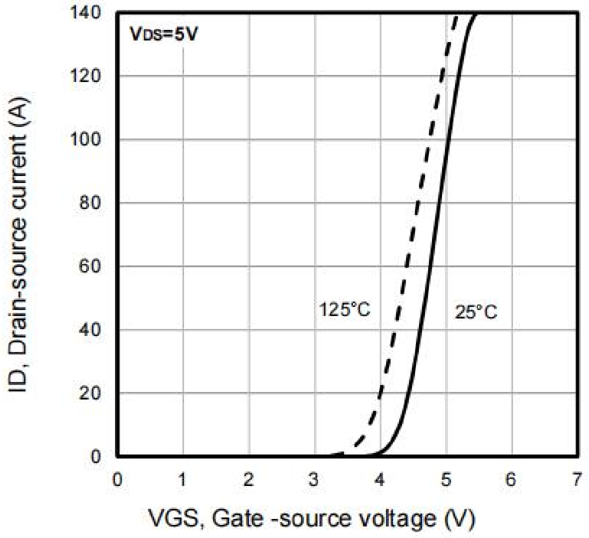


Fig3. Typical transfer characteristics

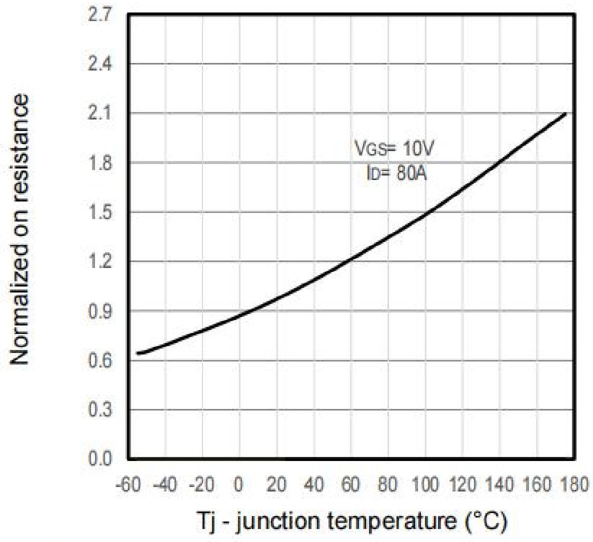


Fig4. Typical normalized on-resistance Vs. Tj

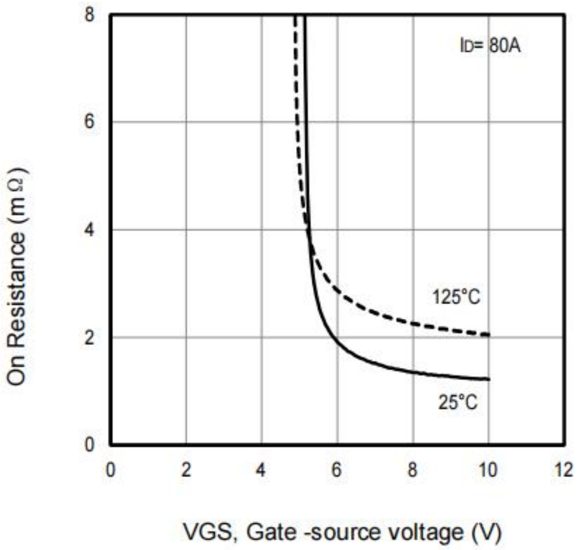


Fig5. Typical on resistance Vs gate -source voltage

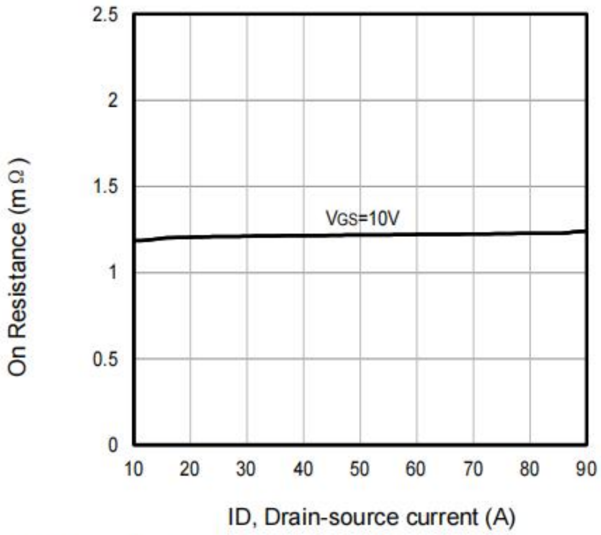


Fig6. Typical on resistance Vs drain current

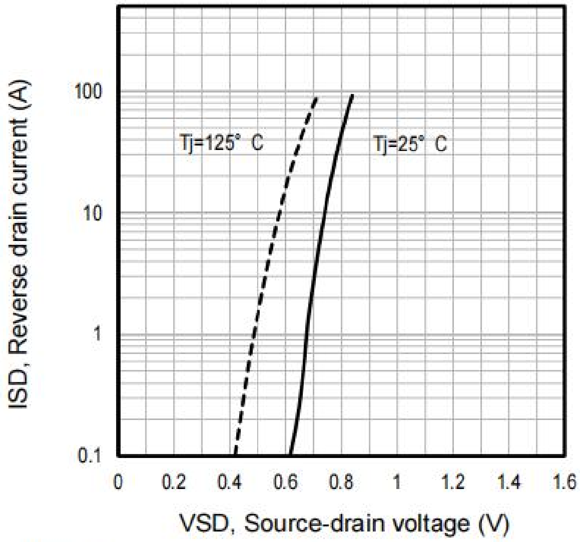


Fig7. Typical source-drain diode forward voltage

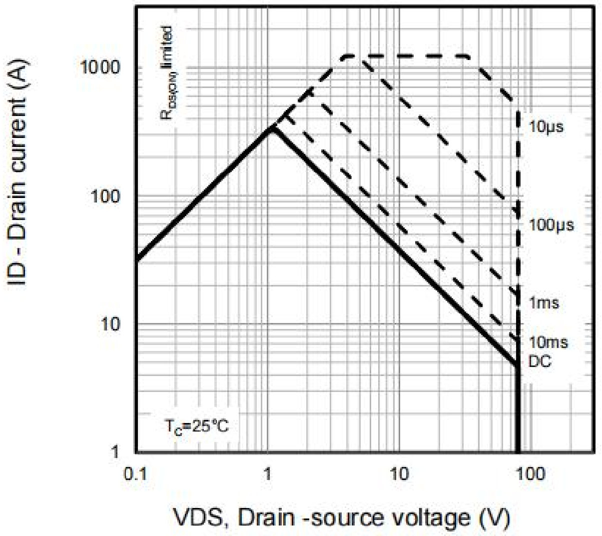


Fig8. Maximum safe operating area

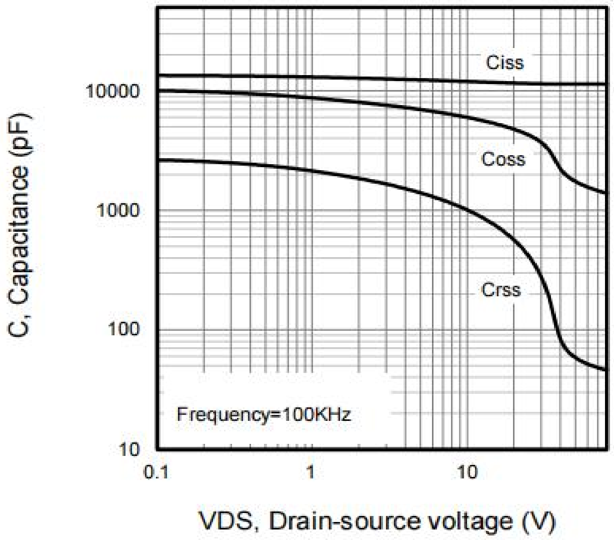


Fig9. Typical capacitance Vs. drain-source voltage

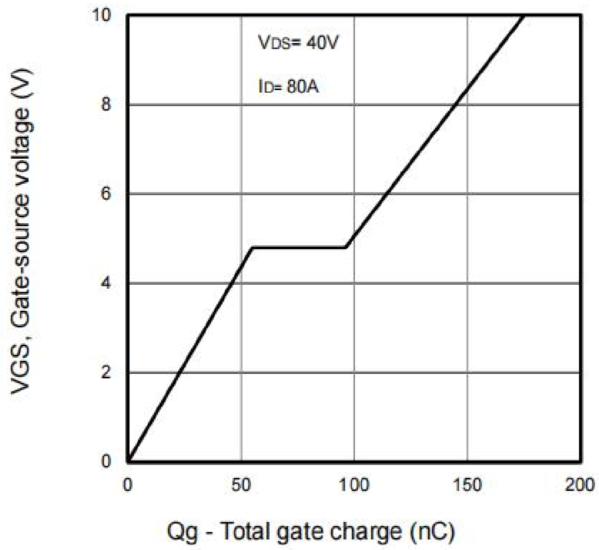


Fig10. Typical gate charge Vs. gate-source voltage

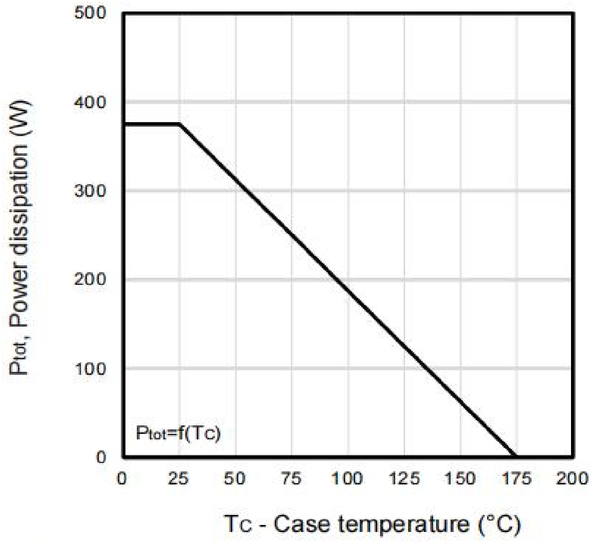


Fig11. Power dissipation Vs. case temperature

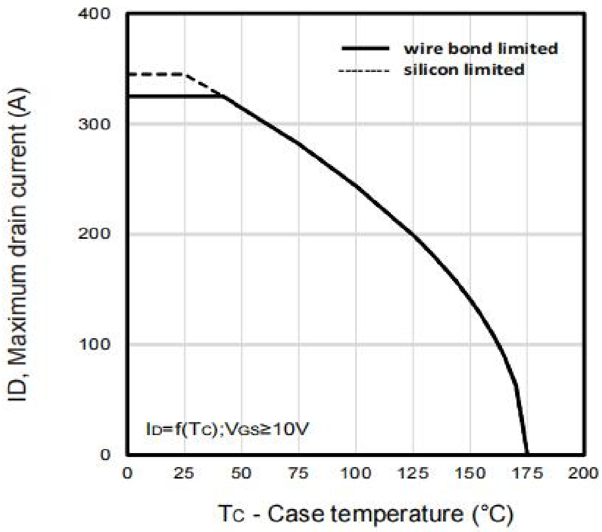


Fig12. Maximum drain current Vs. case temperature

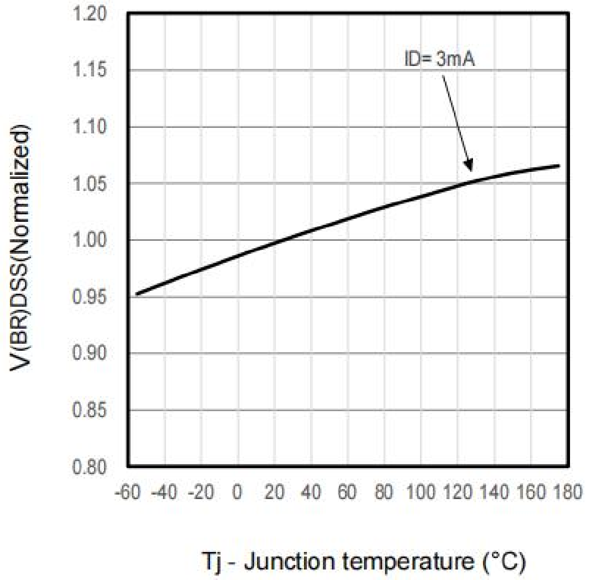


Fig13. Typical V(BR)DSS Vs Tj

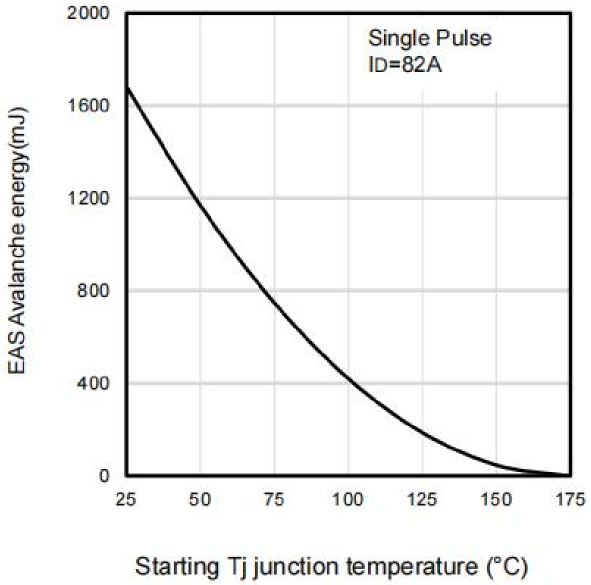
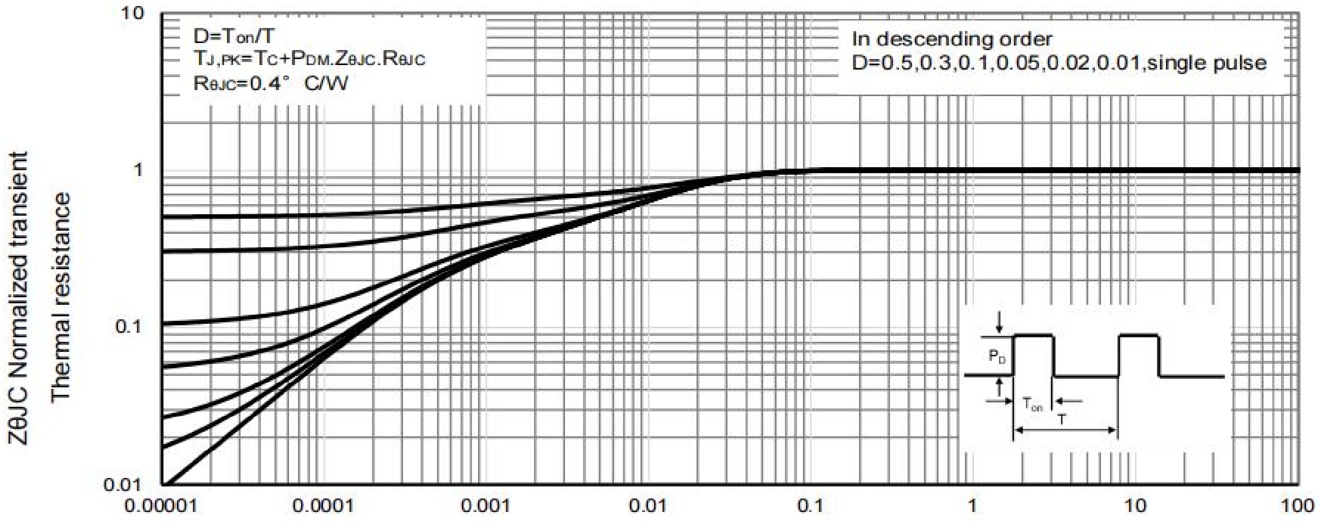


Fig14. Maximum avalanche energy vs temperature (°C)



Pulse width (s)

Fig15 . Normalized maximum transient thermal impedance

Test circuits and waveforms

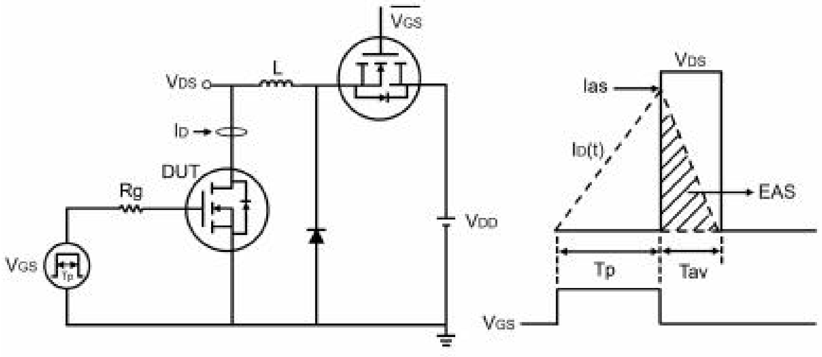


Fig16. Unclamped inductive test circuit and waveforms

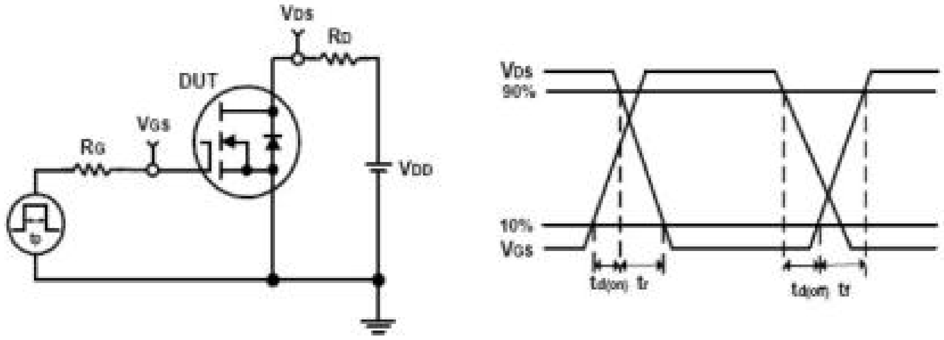
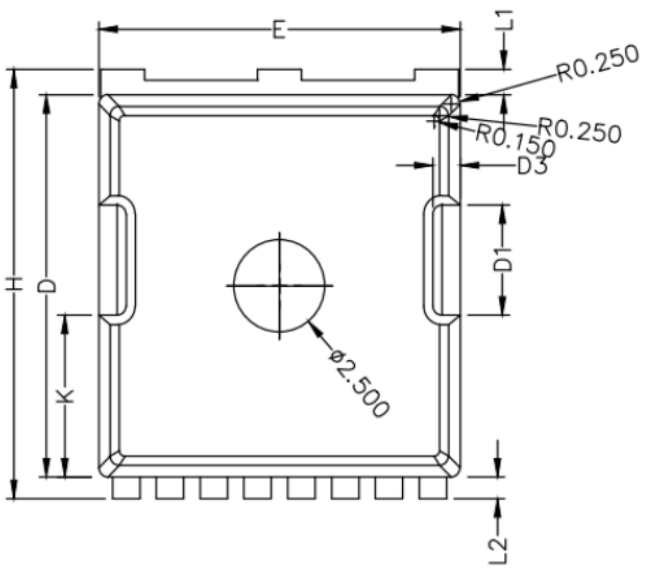
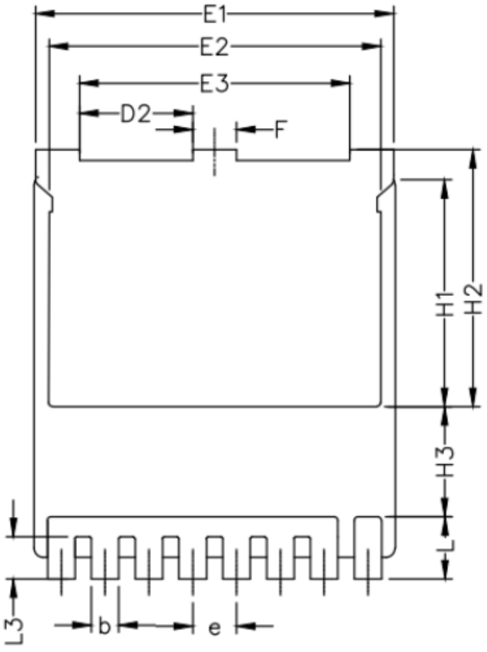


Fig17. Switching time test circuit and waveforms

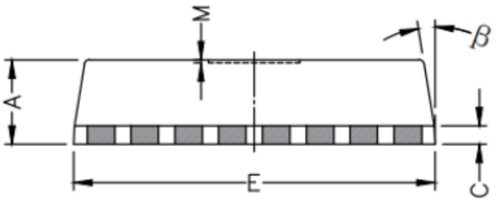
Package Outline Dimensions



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

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