

Description

The TFD085N03MG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V This device is suitable for use as a Battery protection or in other switching application.

General Feature

$V_{DS} = 30V$, $I_D = 23A$

$R_{DS(ON) Typ} = 8.7m\Omega @ V_{GS} = 10V$

$R_{DS(ON) Typ} = 12m\Omega @ V_{GS} = 4.5V$

High Power and current handing cap

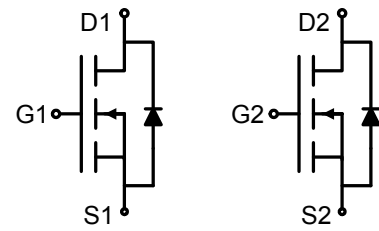
ability Lead free product is acquired

Surface mount package

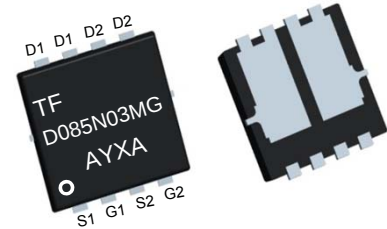
Application

Battery switch

DC/DC converter



Schematic diagram



PDFN3333-8L

●Package Marking and Ordering Information:

Part NO.	TFD085N03MG
Marking1	D085N03MG:TFD085N03MG
Marking2	TF:tuofeng; Y:year code; X:Week; AA:device code;
Basic ordering unit (pcs)	5000

●Absolute Maximum Ratings ($T_C = 25^\circ C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	23	A
	$I_{D@TC=75^\circ C}$	16	A
	$I_{D@TC=100^\circ C}$	13	A
Pulsed Drain Current ①	I_{DM}	70	A
Total Power Dissipation	$P_D@TC=25^\circ C$	15	W
Total Power Dissipation	$P_D@TA=25^\circ C$	0.9	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	E_{AS}	23	mJ



●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	8.0	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	65	° C/W
Soldering temperature, wavesoldering for 8 s	T_{sold}	-	-	265	° C

●Electronic Characteristics($T_j=25$,unless otherwise notse)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.1	1.4	2.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	8.7	10	m Ω
		$V_{GS}=4.5V, I_D=8.0A$	-	12	15	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=25V, I_D=10A$	-	8	-	S
Source-drain voltage	V_{SD}	$I_S=10A$	-	-	1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz $V_{DS}=15V$ $V_{GS}=0V$	-	375.0	-	pF
Output capacitance	C_{oss}		-	160.0	-	
Reverse transfer capacitance	C_{rss}		-	19.0	-	

●Gate Charge characteristics($T_a = 25^\circ C$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD} = 15V$	-	8.30	-	nC
Gate - Source charge	Q_{gs}	$I_D = 10A$	-	1.90	-	
Gate - Drain charge	Q_{gd}	$V_{GS} = 10V$	-	1.60	-	

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

Typical Electrical and Thermal Characteristics

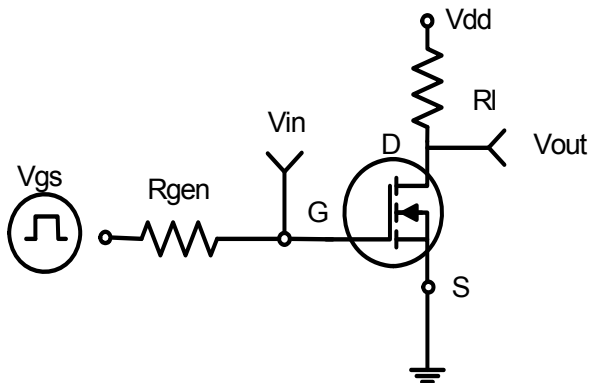


Figure 1 Switching Test Circuit

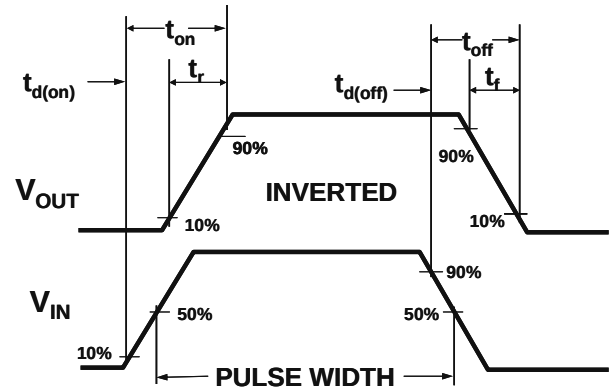


Figure 2 Switching Waveforms

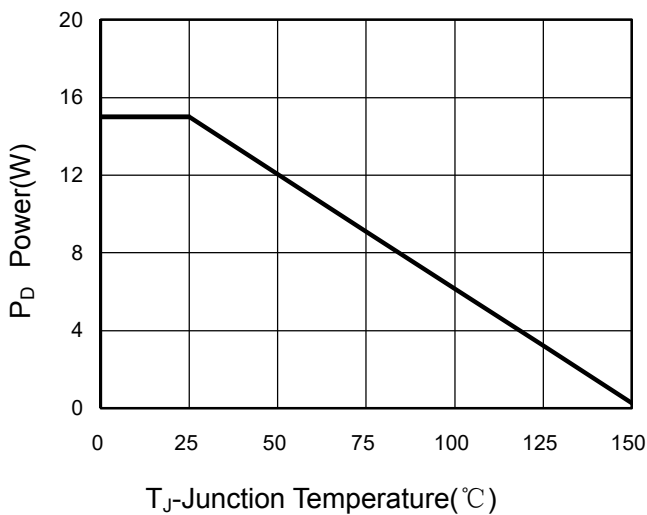


Figure 3 Power Dissipation

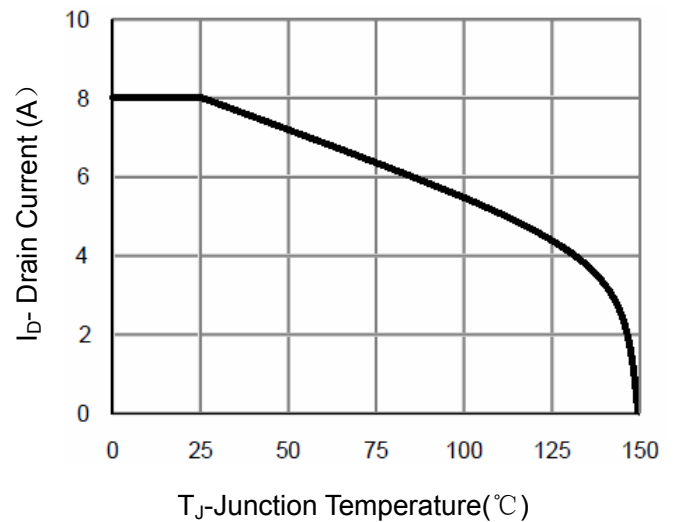


Figure 4 Drain Current

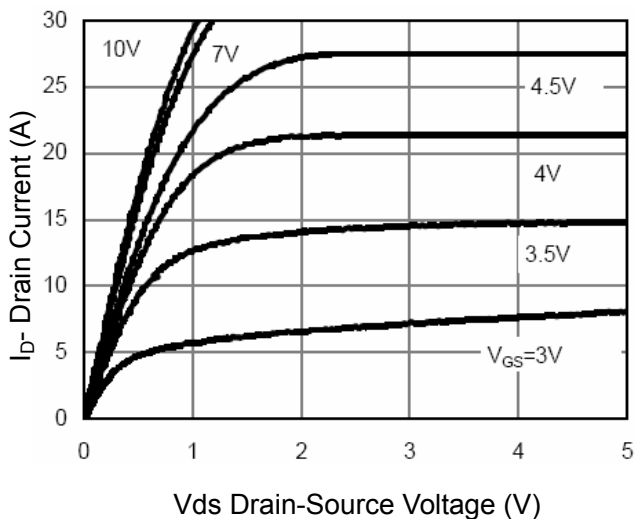


Figure 5 Output Characteristics

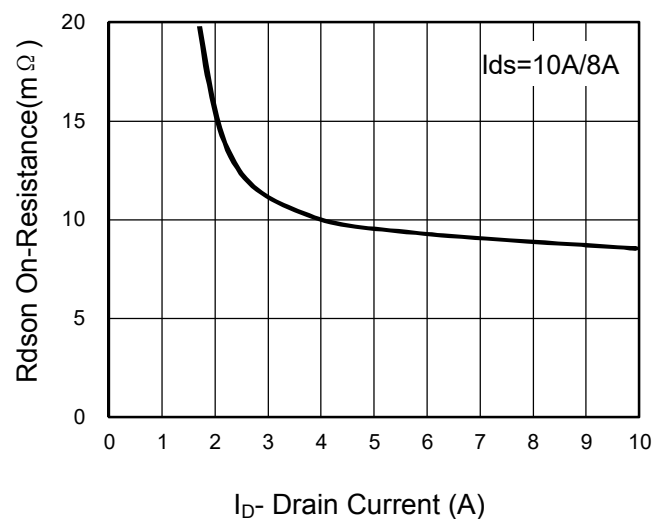


Figure 6 Drain-Source On-Resistance

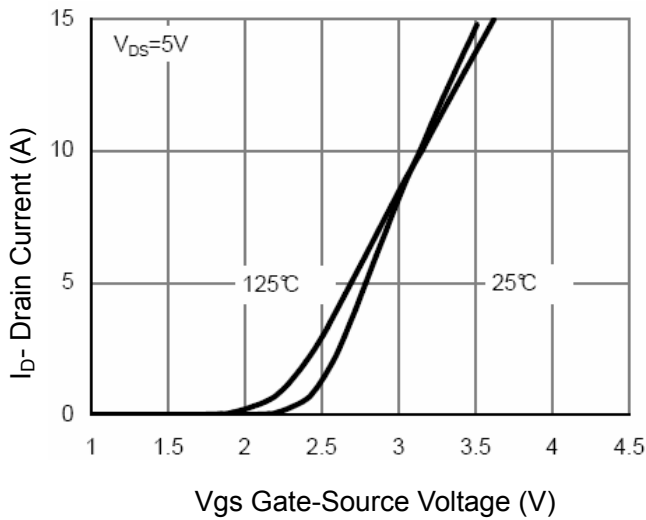


Figure 7 Transfer Characteristics

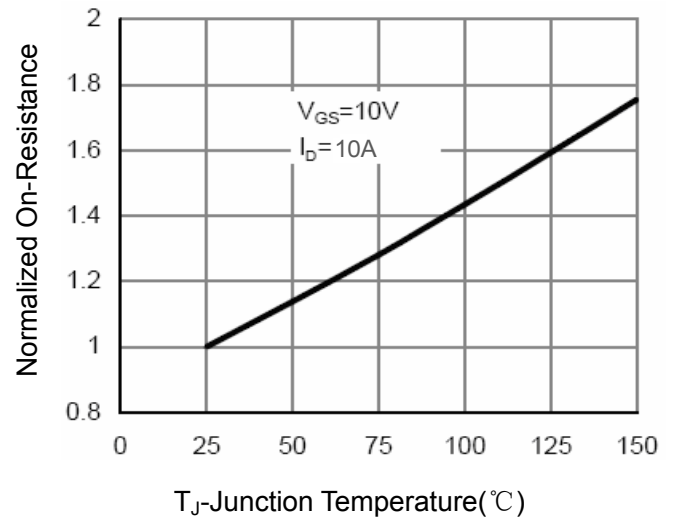


Figure 8 Drain-Source On-Resistance

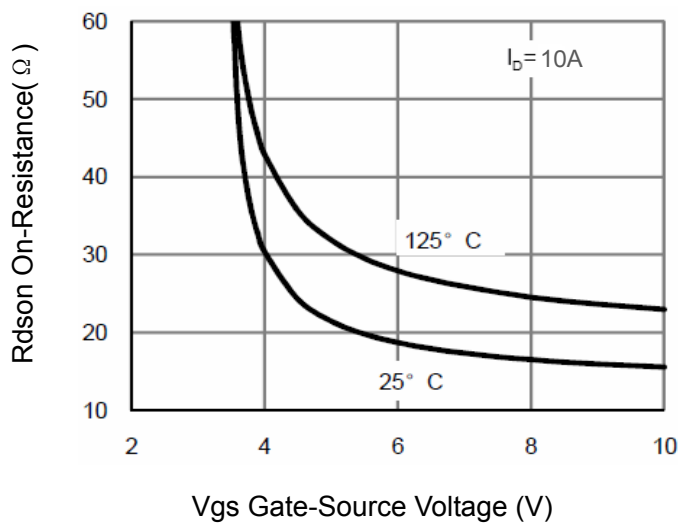


Figure 9 Rdson vs Vgs

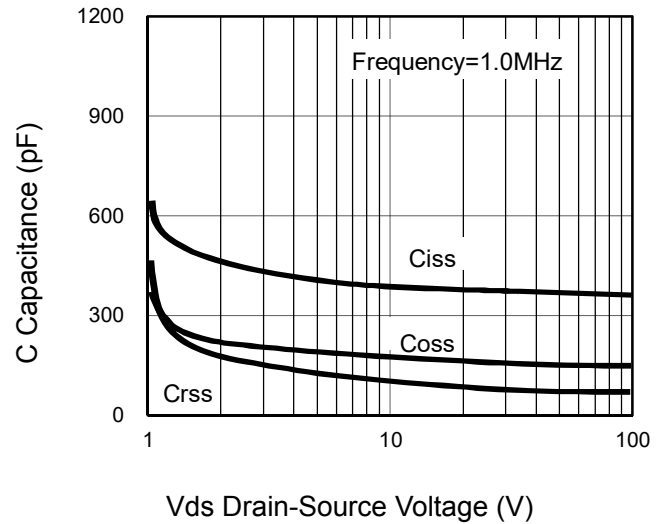


Figure 10 Capacitance vs Vds

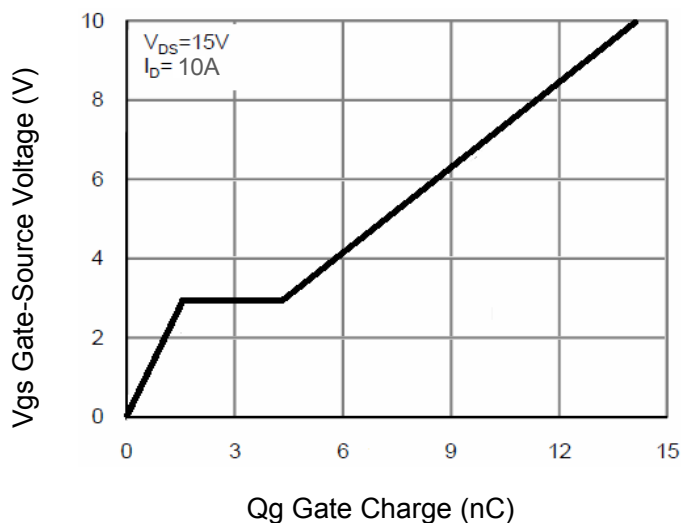


Figure 11 Gate Charge

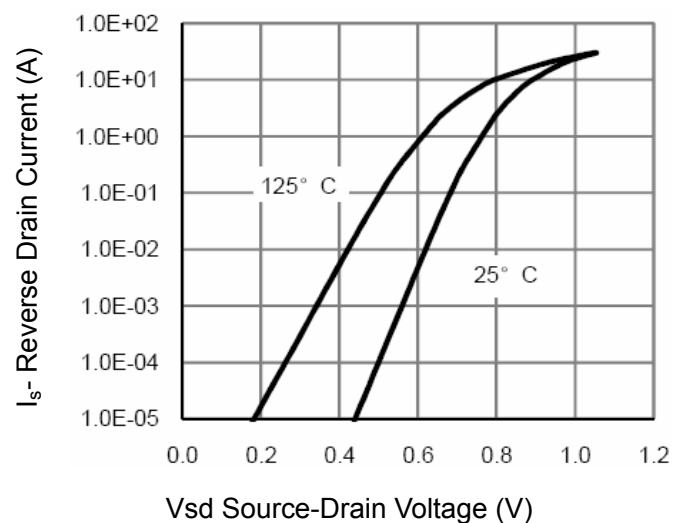


Figure 12 Source- Drain Diode Forward

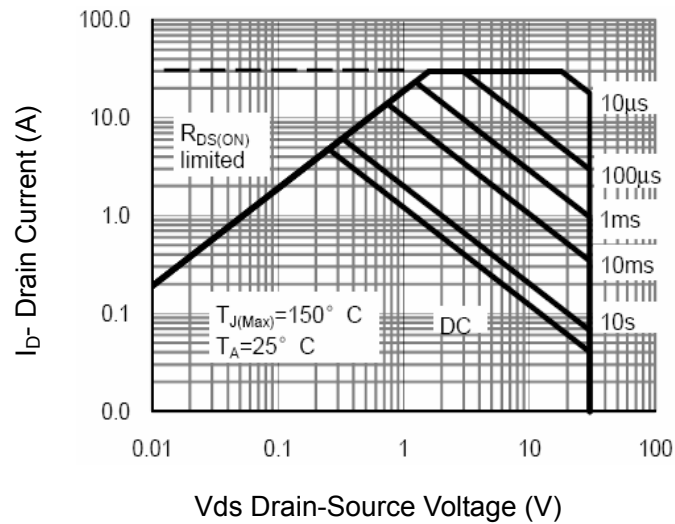


Figure 13 Safe Operation Area

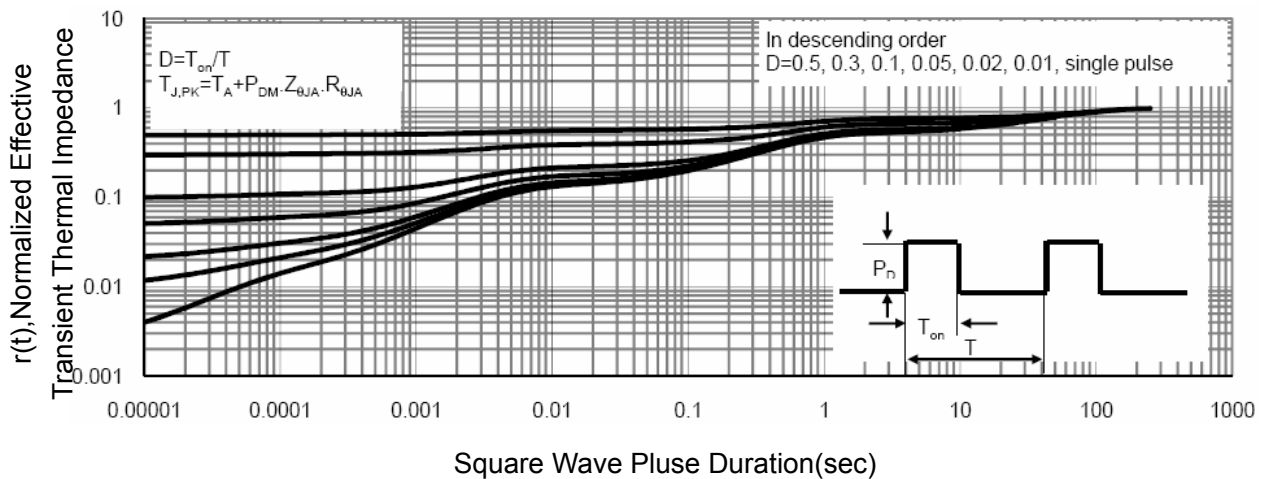
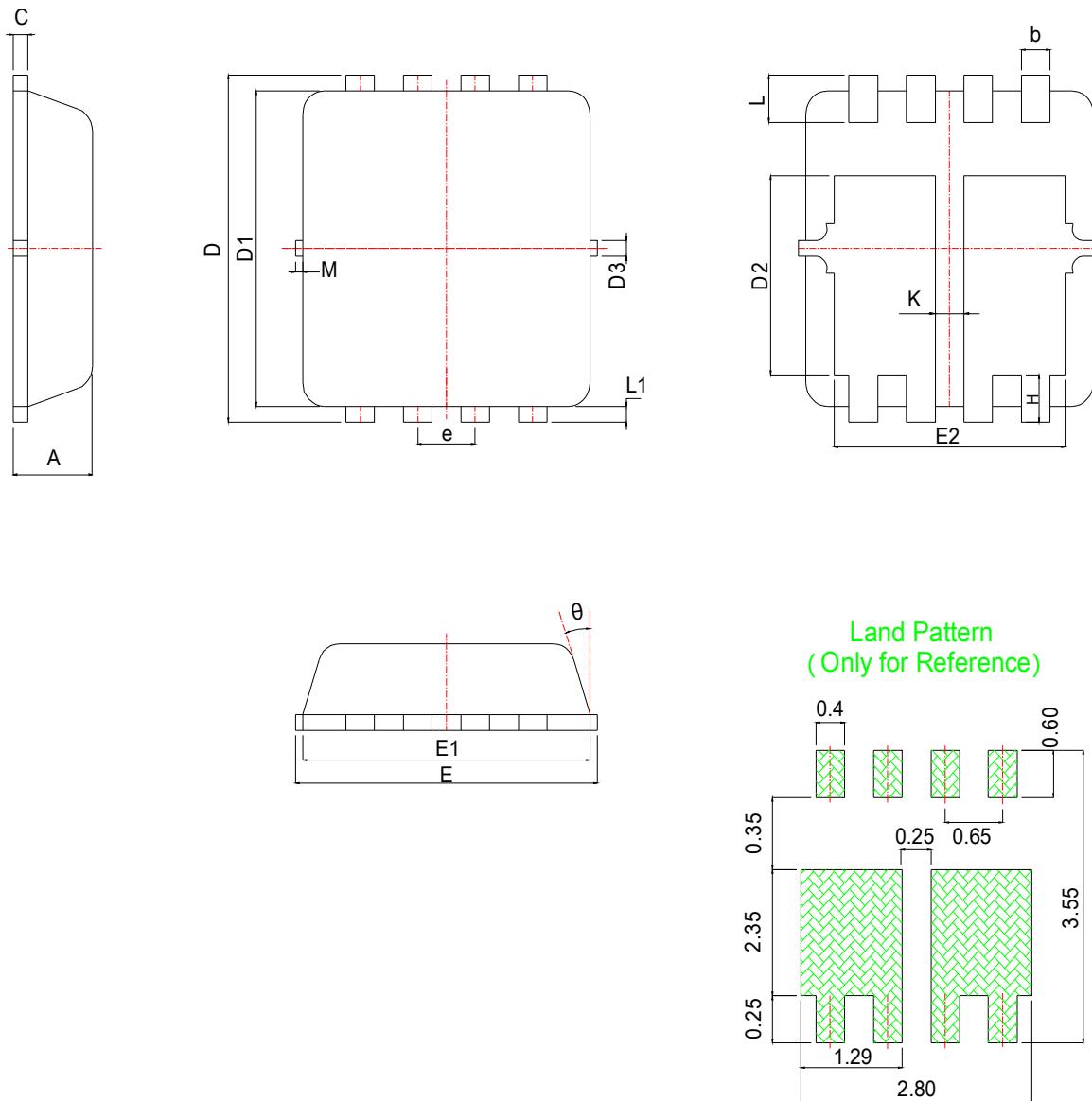


Figure 14 Normalized Maximum Transient Thermal Impedance



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	θ	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006
K	0.30	*	*	0.012	*	*							