

Dual Enhancement Mode MOSFET (N- and P-Channel)

DESCRIPTION

The VIC1642DN-F is the highest performance trench N-Ch and P-Ch MOSFETs With extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

This device is suitable for use as a load switch or in PWM applications.

FEATURE

Channel	BV _{DSS}	R _{DS(on)} (V _{GS} =10V)	I _D
N-Ch	40V	14mΩ (TYP.)	22A
p-Ch	-40V	25mΩ (TYP.)	-21A

APPLICATIONS

- ◆ Motor Control
- ◆ For Fan Pre-driver H-Bridge
- ◆ Load/power switch

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS(T_A=25°C Unless otherwise noted)

Symbol	Parameter	Rating		Unit
		N-Ch	P-Ch	
V _{DSS}	Drain-Source Voltage	40	-40	V
V _{GSS}	Gate-Source Voltage	±20	±20	
I _D	Continuous Drain Current ,(V _{GS} =10V)	22	-21	A
I _{DP}	Drain Current (Pulse)	60	-48	A
T _J	Maximum Junction Temperature	-55 to 150		°C
T _{STG}	Storage Temperature Range	-55 to 150		
P _D	Maximum Power Dissipation (T _a =25°C)	35	35	W



● **ELECTRICAL CHARACTERISTICS**($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Symbol	Parameter	Test Conditions	N-CH			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=32V, V_{GS}=0V$	--	--	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	V
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
$R_{DS(ON) a}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=15A$	--	14	18	m Ω
		$V_{GS}=4.5V, I_D=8A$	--	18	23	
g_{fs}	Forward Transconductance a	$V_{ds}=5V, I_d=15A$	--	35	--	S
Dynamic b						
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=32V, I_D=15A$	--	11	15	nC
Q_{gs}	Gate-Source Charge		--	2.65	3.7	
Q_{gd}	Gate-Drain Charge		--	4.9	6.8	
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, f=1MHz$	--	1023	1428	pF
C_{oss}	Output Capacitance		--	108	152	
C_{rss}	Reverse Transfer Capacitance		--	78	108	
SWITCHING CHARACTERISTICS						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, V_{GS}=10V, I_{DS}=15A, R_G=3.3\Omega$	--	2.9	5.8	ns
$t_{d(OFF)}$	Turn-off Delay Time		--	21.4	43	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_s	Drain-Source Diode Forward Current	$V_g=V_d=0V, \text{Force Current}$	--	--	15	A
$V_{sd a}$	Diode Forward Voltage	$I_s = 1A, V_{GS} = 0V$	--	--	1.2	V



● **ELECTRICAL CHARACTERISTICS(TA=25°C Unless otherwise noted)**

Symbol	Parameter	Test Conditions	P-CH			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V	--	--	-1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.2	-1.5	-2.5	V
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
R _{DS(ON) a}	Drain-Source On-state Resistance	V _{GS} =-10V, I _D =-8A	--	25	32	mΩ
		V _{GS} =-4.5V, I _D =-4A	--	38	46	
g _{fs}	Forward Transconductance a	V _{ds} =5V, I _d =-8A	--	11	--	S
Dynamic b						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-15V, I _d =-1A	--	12	--	nC
Q _{gs}	Gate-Source Charge		--	3.5	--	
Q _{gd}	Gate-Drain Charge		--	3.3	--	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz	--	1415	--	pF
C _{oss}	Output Capacitance		--	134	--	
C _{rss}	Reverse Transfer Capacitance		--	102	--	
SWITCHING CHARACTERISTICS						
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, V _{GS} =-10V, I _{DS} =-1A, R _G =3.3Ω	--	22	--	ns
t _{d(OFF)}	Turn-off Delay Time		--	59	--	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _s	Continuous Source Current	V _g =V _d =0V, Force Current	--	--	-15	A
V _{sd a}	Diode Forward Voltage	I _s = -1A, V _{GS} = 0V	--	--	-1.2	V

Notes:

- a. Pulse test; pulse width ≤ 300us, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. consult us, or our representatives before use, to confirm that the information in this datasheet is up to date.

We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

● **N-CH TYPICAL CHARACTERISTICS (TA=25°C Unless otherwise noted)**

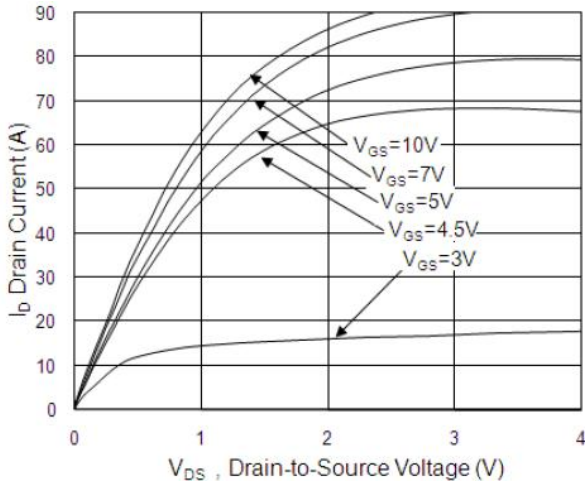


Fig.1 Typical Output Characteristics

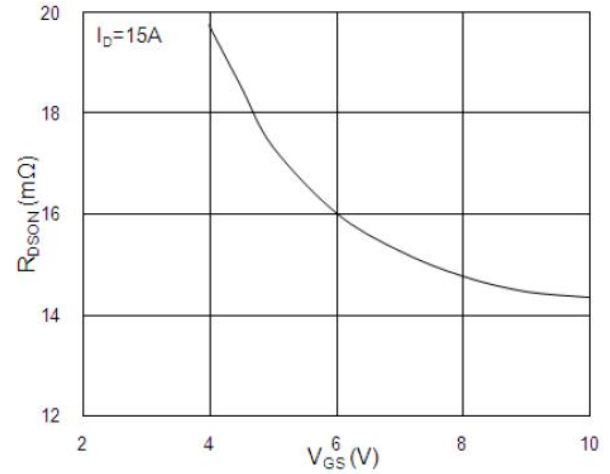


Fig.2 On-Resistance v.s Gate-Source

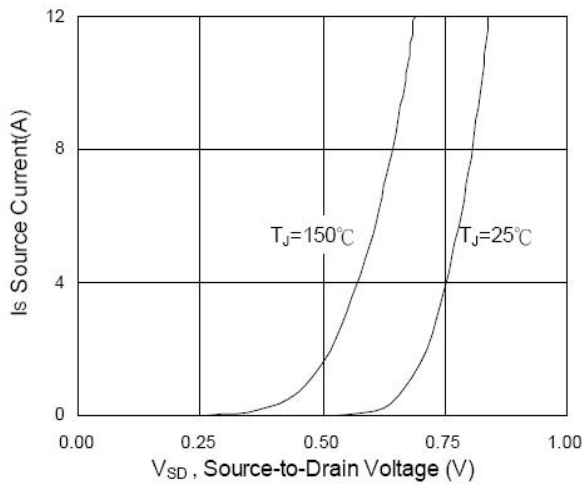


Fig.3 Forward Characteristics of Reverse

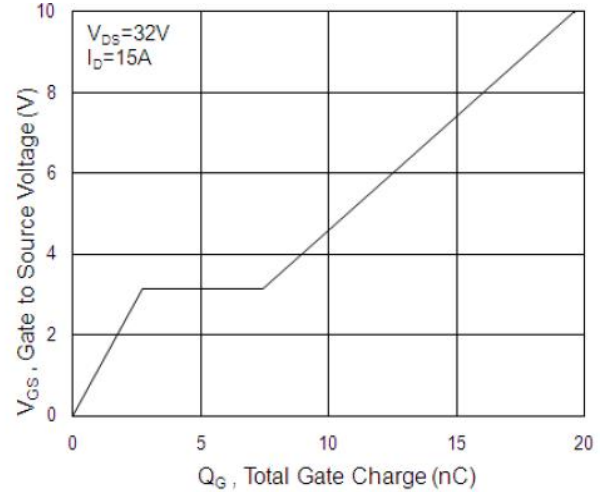


Fig.4 Gate-Charge Characteristics

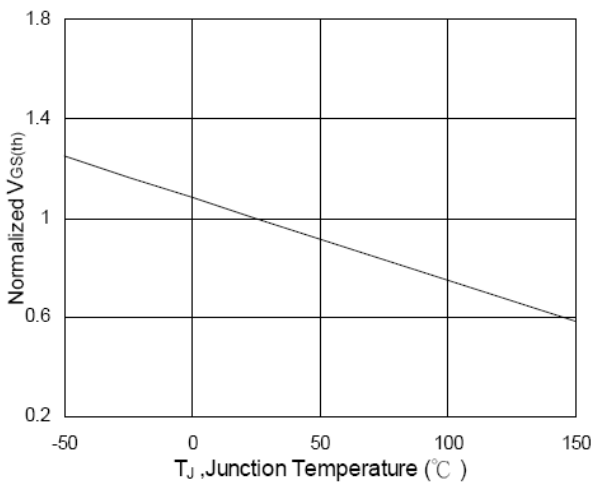


Fig.5 Normalized Vgs(th) v.s Tj

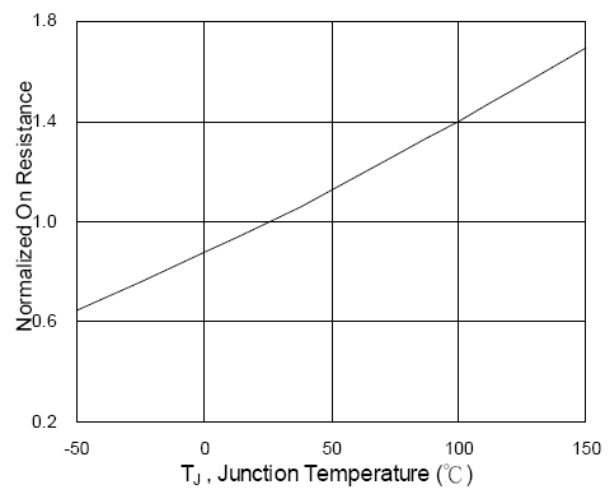


Fig.6 Normalized Rds(on) v.s Tj

● **N-CH TYPICAL CHARACTERISTICS (TA=25°C Unless otherwise noted)**

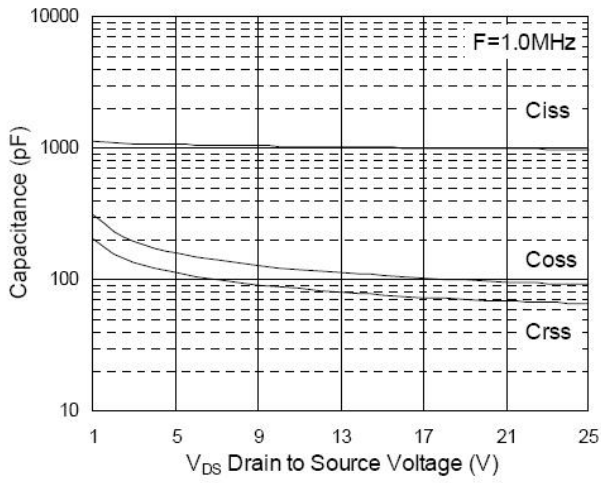


Fig.7 Capacitance

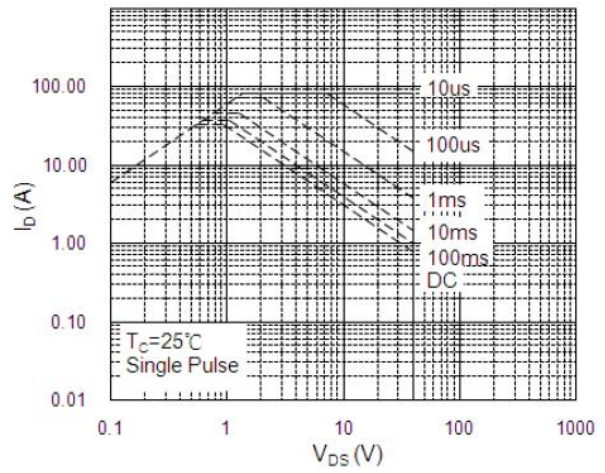


Fig.8 Safe Operating Area

● **P-CH TYPICAL CHARACTERISTICS (TA=25°C Unless otherwise noted)**

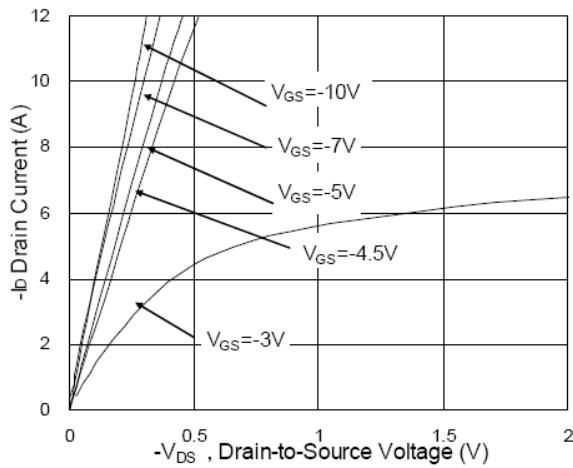


Fig.1 Typical Output Characteristics

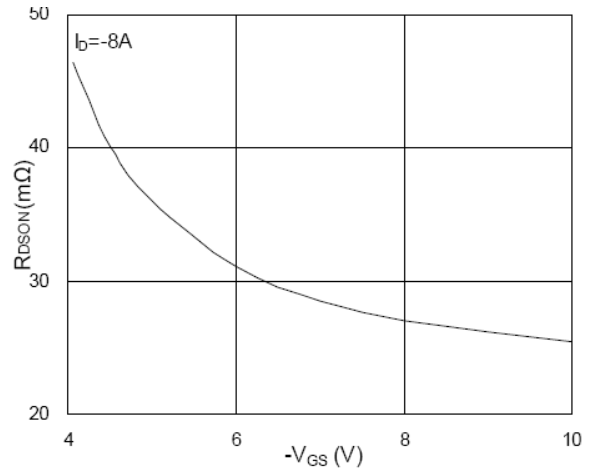


Fig.2 On-Resistance v.s Gate-Source

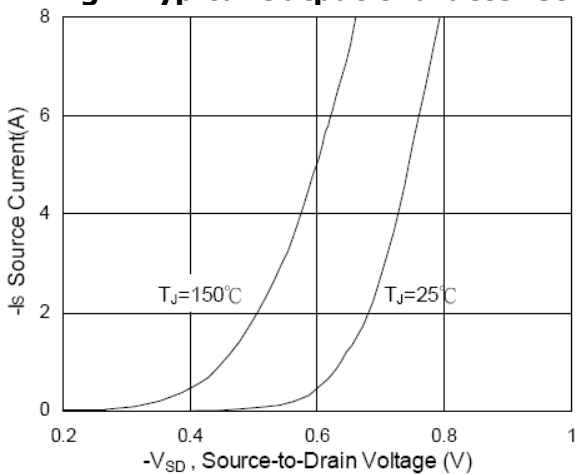


Fig.3 Forward Characteristics of Reverse

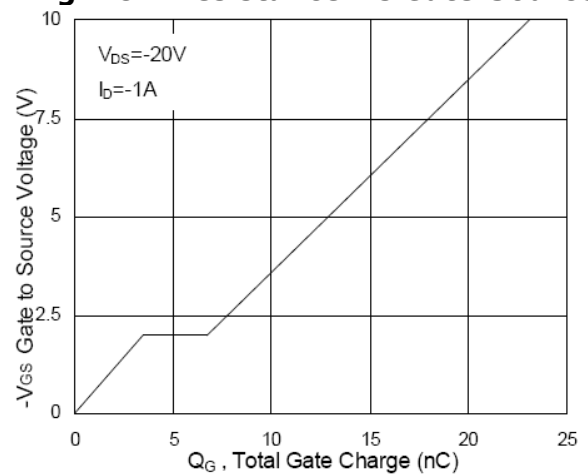


Fig.4 Gate Charge Characteristics

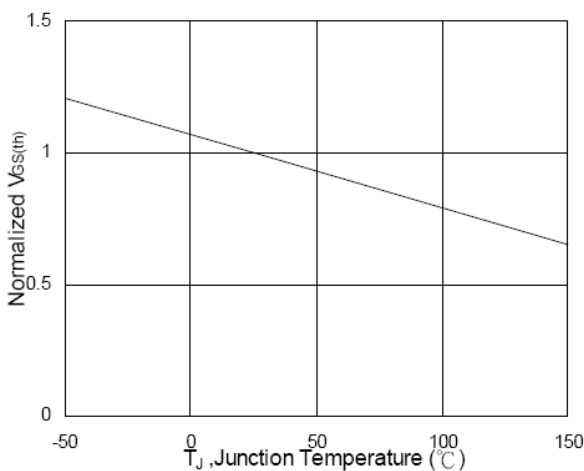


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

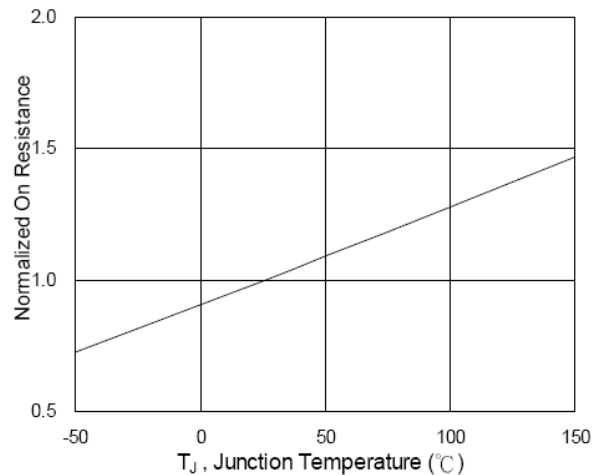


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

● **P-CH TYPICAL CHARACTERISTICS (TA=25°C Unless otherwise noted)**

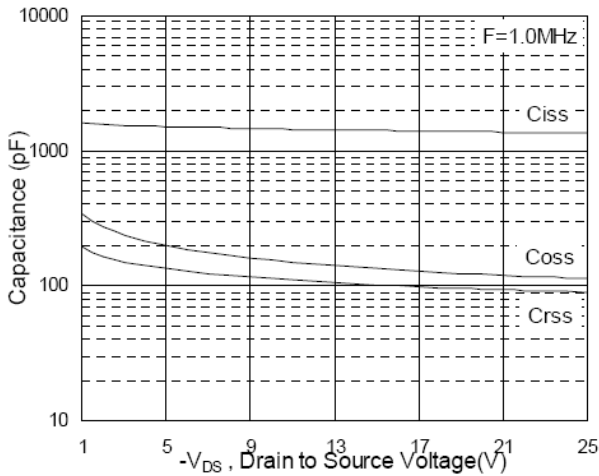


Fig.7 Capacitance

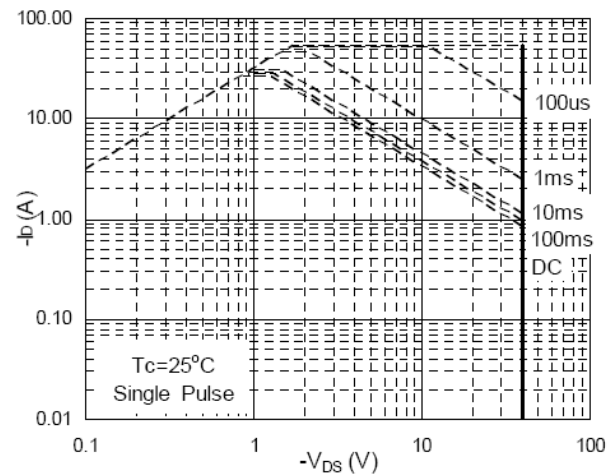


Fig.8 Safe Operating Area

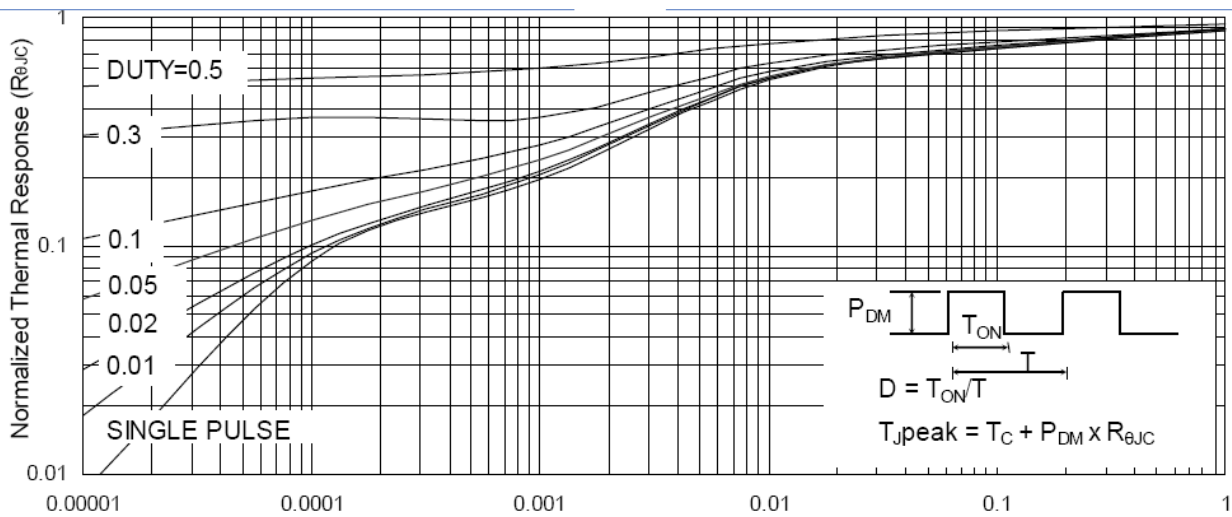
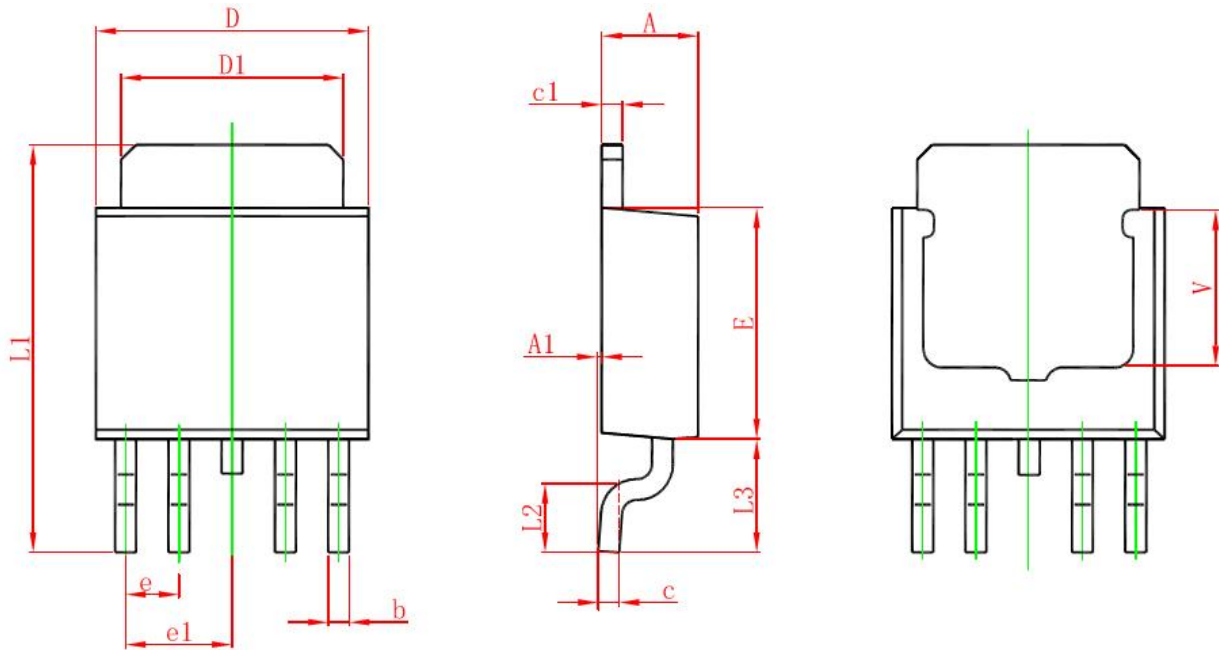


Fig.9 Normalized Maximum Transient Thermal Impedance

● ORDERING INFORMATION

Part Number	Package code	Shipping
VIC1642DN-F	DN-F: TO252-4	2500/Tape & Reel

● PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.400	0.600	0.016	0.024
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	1.270 TYP		0.050 TYP	
e1	2.540 TYP		1.000 TYP	
L1	9.500	9.900	0.374	0.390
L2	1.400	1.780	0.055	0.070
L3	2.550	2.900	0.100	0.114
V	3.45 REF		0.136 REF	

单击下面可查看定价，库存，交付和生命周期等信息

[>>VIC\(微科\)](#)