

P-Channel Logic Level Enhancement Mode Field Effect Transistor (-40V, -15A)

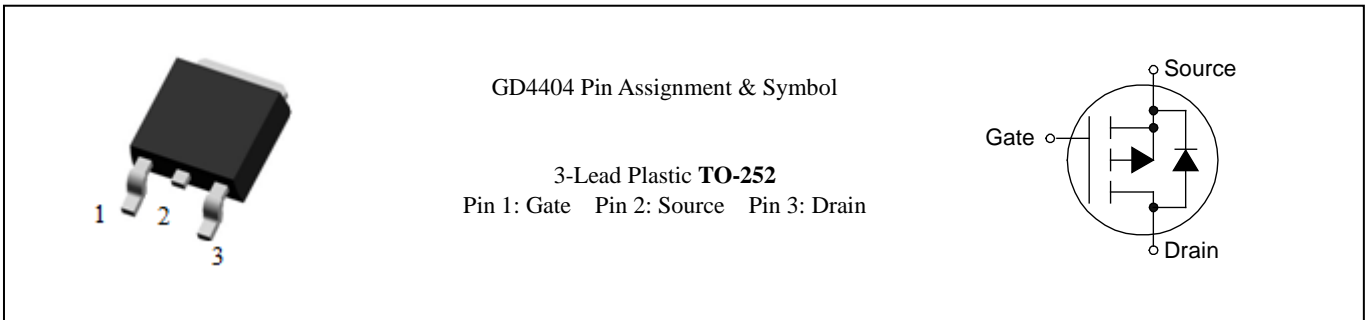
PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max
-40V	-15A	44 @ $V_{GS} = -10V, I_D = -15A$
		68 @ $V_{GS} = -4.5V, I_D = -8A$

Features

- Rugged and reliable
- Surface Mount package
- High power and current handling capability.
- Super high dense cell design for extremely low $R_{DS(on)}$.
- Ordering information : GD4404 (Lead(Pb)-free and halogen-free)

RoHS+HF



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current @ $T_c = 25^\circ\text{C}$	-15	A
I_{DM}	Drain Current (Pulsed) ^b	-32	A
P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$	2.5	W
E_{AS}^c	Avalanche Energy, Single Pulse @ $L = 0.3\text{mH}$	-11.6	A
I_{AS}^c	Avalanche Current, Single Pulse @ $L = 0.3\text{mH}$	20	mJ
T_{stg}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_j	Junction Temperature	150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	80	$^\circ\text{C/W}$

Note: a: Surface Mounted on FR4 Board, $t \leq 5\text{sec}$.

b: Pulse width limited by maximum junction temperature.

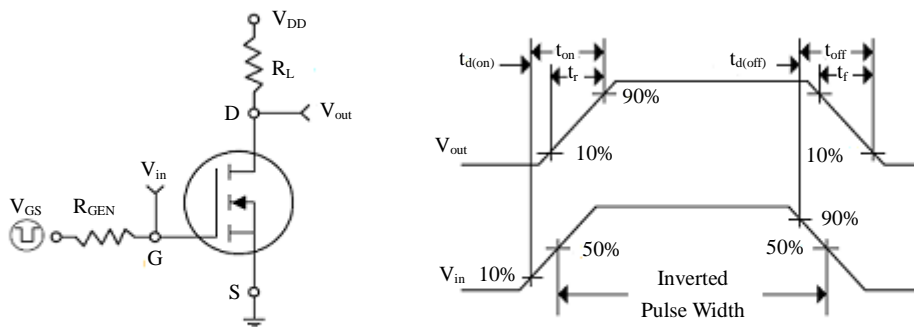
c: Repetitive rating, pulse width limited by junction temperature $T_j = 25^\circ\text{C}$

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off 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	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±250	nA
• On Characteristics ^d						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-	-3.0	V
I _{DS(on)}	On-State Drain Current	V _{DS} =-5V, V _{GS} =-10V	-32	-	-	A
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D = -15A	-	36	44	mΩ
		V _{GS} =-4.5V, I _D = -8A	-	41	68	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D = -10A	-	11	-	S
• Dynamic Characteristics ^e						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	-	660	-	pF
C _{oss}	Output Capacitance		-	300	-	
C _{rss}	Reverse Transfer Capacitance		-	70	-	
• Switching Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-0.5V, I _D =-10A, V _{GS} =-10V	-	14	-	nC
Q _{gs}	Gate-Source Charge		-	2.2	-	
Q _{gd}	Gate-Drain Charge		-	1.9	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} = -20V, R _L =1Ω, I _D =-1A, V _{GS} =-10V, R _{GEN} =6Ω	-	6.0	12.8	nS
t _r	Turn-on Rise Time		-	9.2	18.6	
t _{d(off)}	Turn-off Delay Time		-	19.2	34.8	
t _f	Turn-off Fall Time		-	11.8	21.6	
• Drain-Source Diode Characteristics						
I _S	Continuous Current		-	-	-10	A
I _{SM}	Pulsed Current		-	-	-30	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _F = I _S	-	-	-1	V

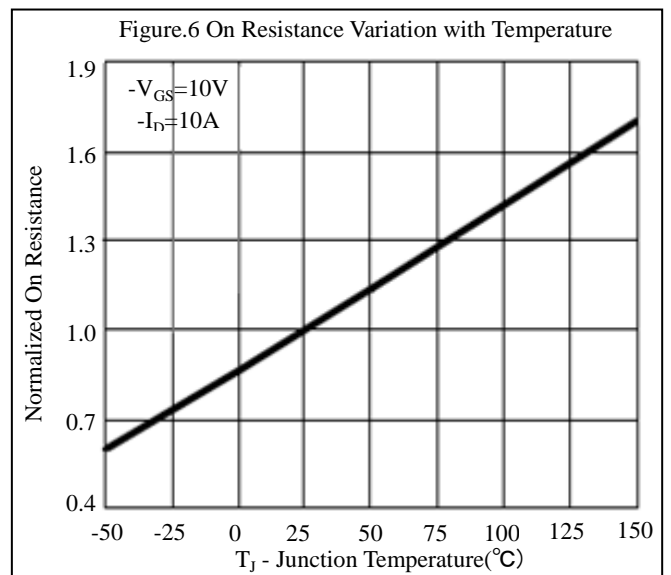
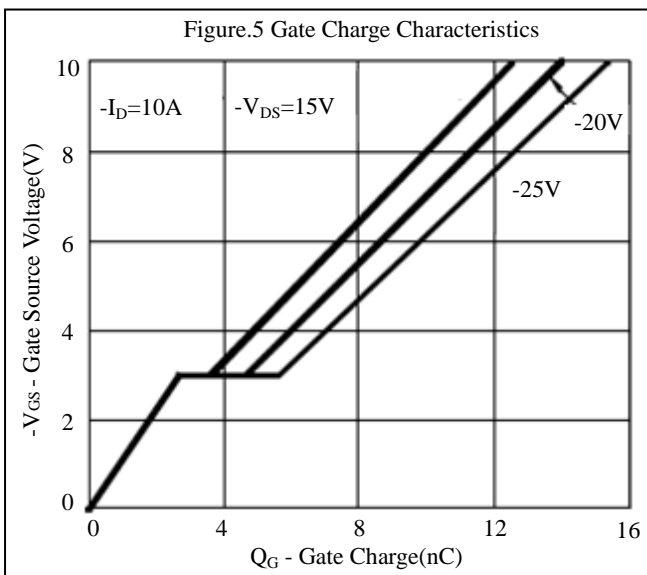
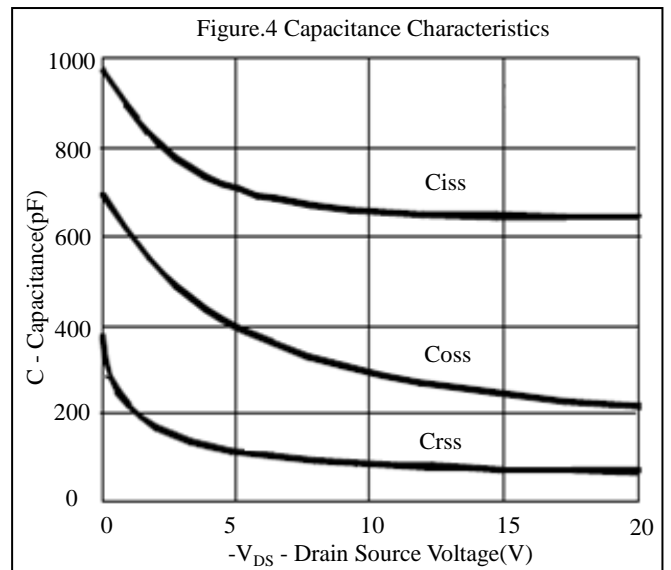
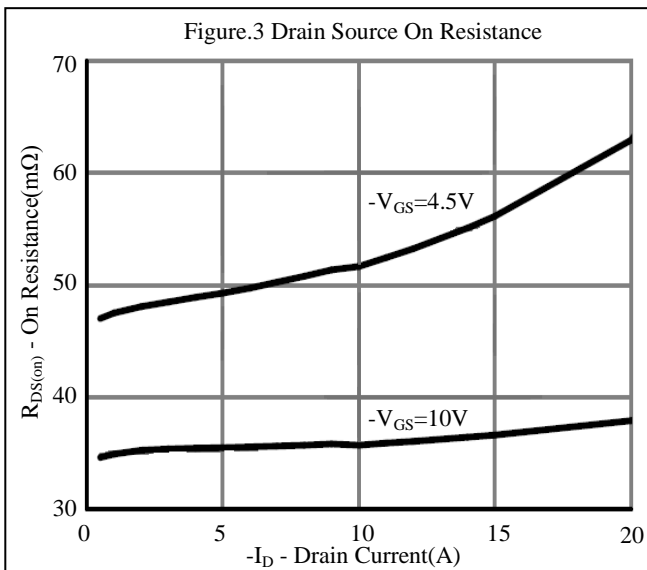
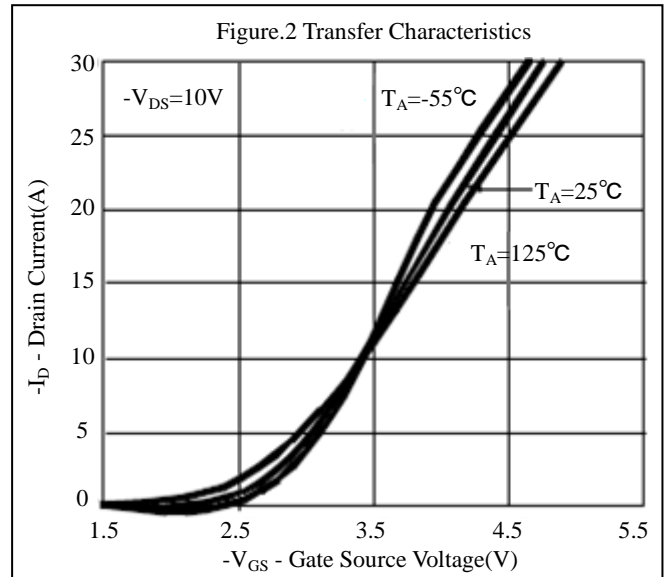
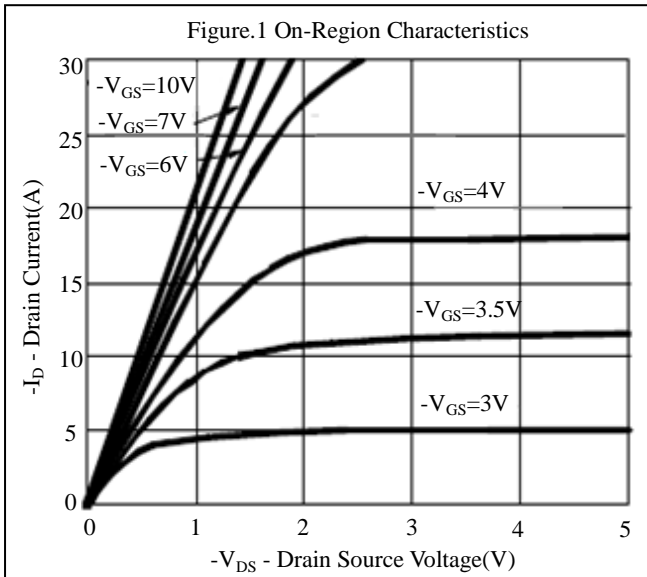
Note: d: Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%

e: Guaranteed by design, not subject to production testing

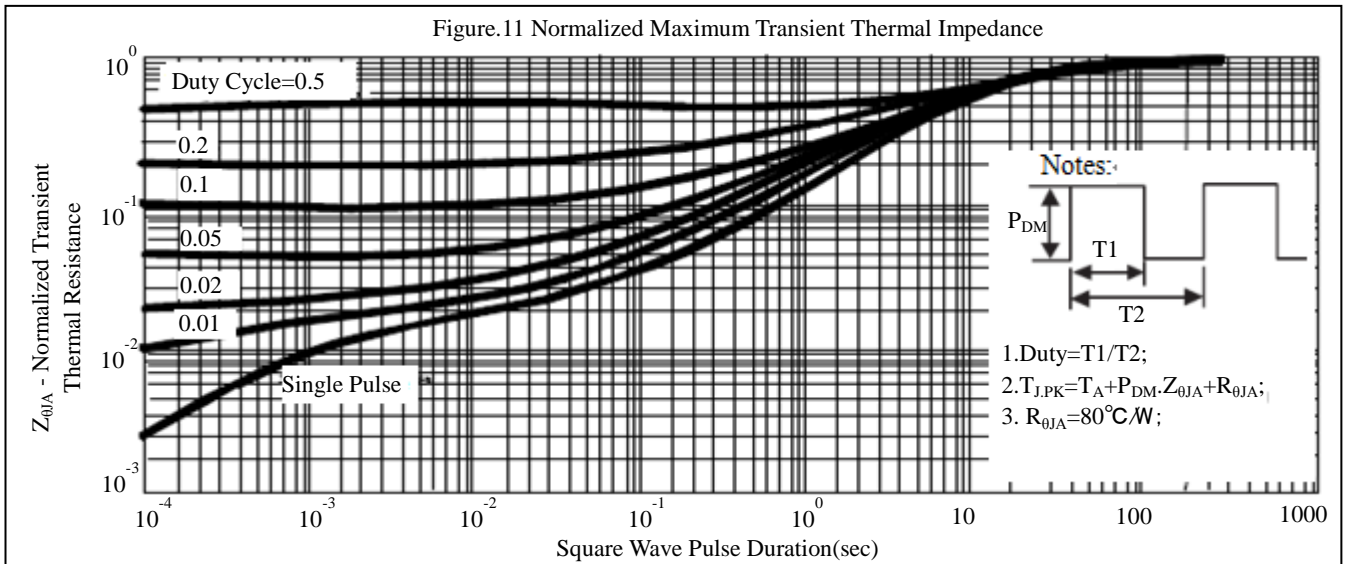
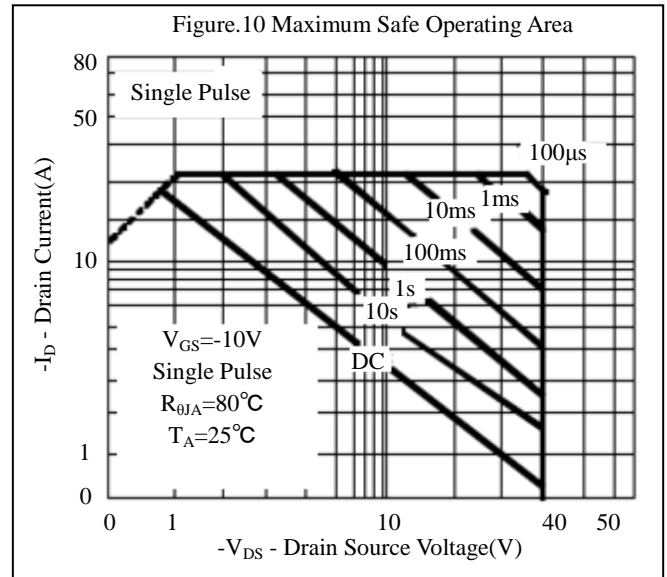
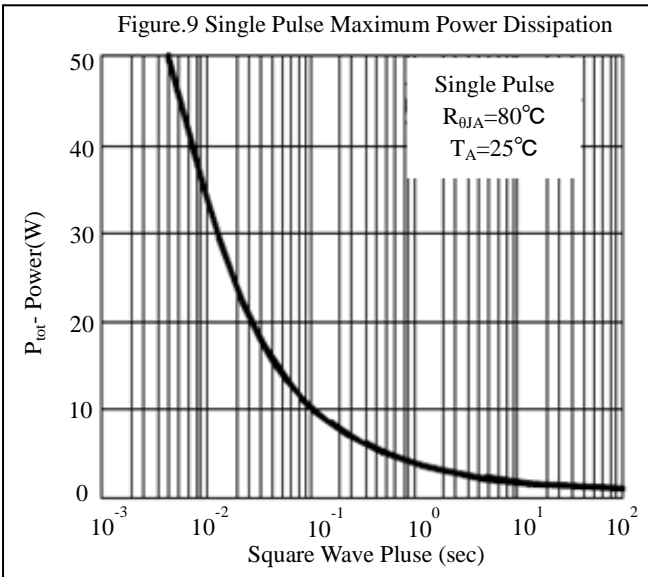
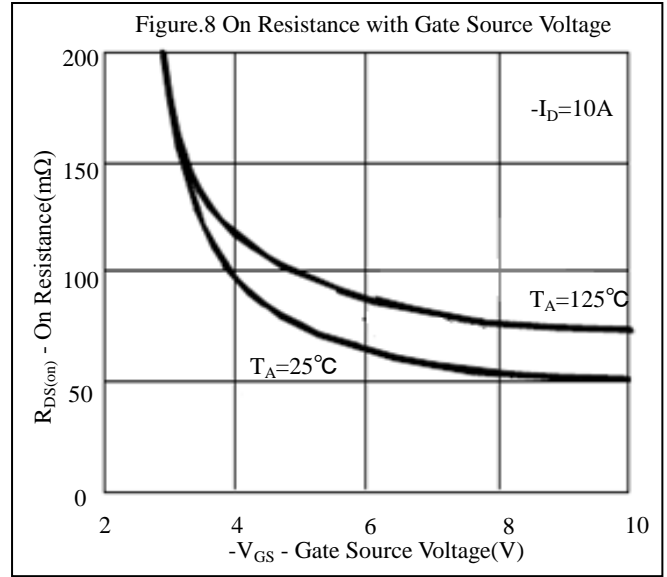
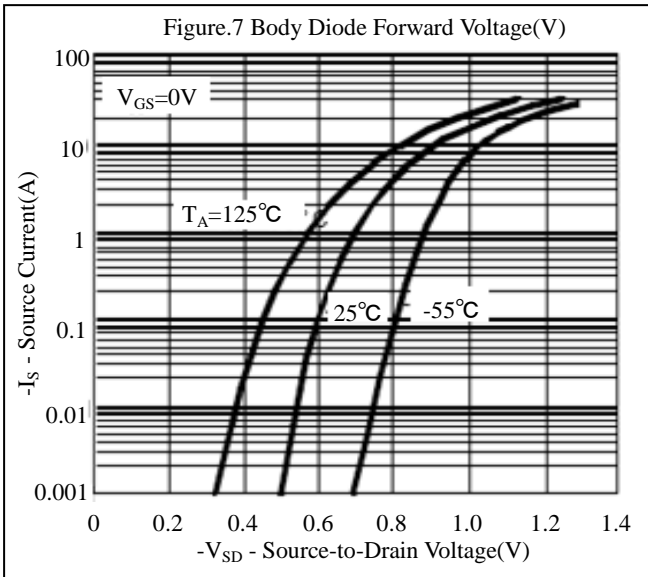


Switching Test Circuit and Switching Waveforms

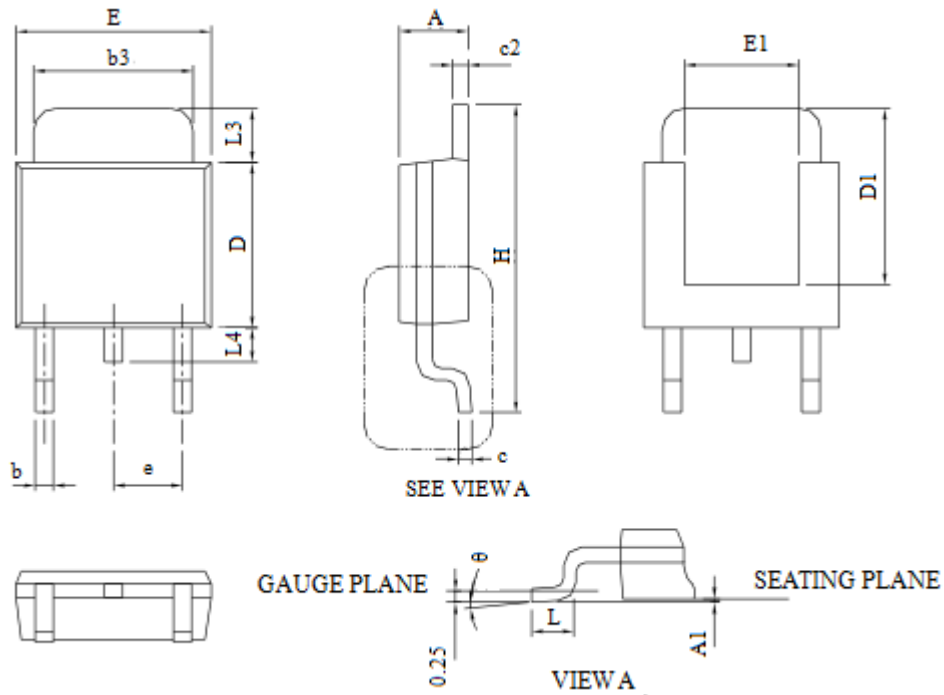
Characteristics Curve



Characteristics Curve



TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters (mm)		Dimensions In Inches (inch)	
	Min	Max	Min	Max
A	2.180	2.390	0.086	0.094
A1	0.000	0.130	0.000	0.005
b	0.500	0.890	0.020	0.035
b3	4.950	5.460	0.195	0.215
c	0.460	0.610	0.018	0.024
c2	0.460	0.890	0.018	0.035
D	5.330	6.220	0.21	0.245
D1	4.570	6.000	0.180	0.236
E	6.350	6.730	0.250	0.265
E1	3.810	6.000	0.150	0.236
e	2.290BSC		0.090BSC	
H	9.400	10.41	0.370	0.410
L	0.900	1.780	0.0035	0.070
L3	0.890	2.030	0.035	0.080
L4	0.000	1.020	0.000	0.040
ϕ	0°	8°	0°	8°



Notice

1. Specification of the products displayed herein is subject to change without notice. Continuous development may necessitate changes in technical data without notice. GEMMICRO or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies.
2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.