N-Channel Enhancement Mode MOSFET TDM2426

DESCRIPTION

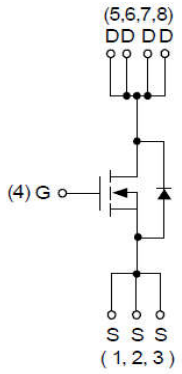
The TDM2426 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

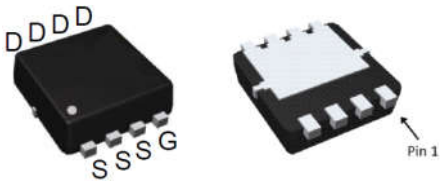
- RDS(ON) <4.9mΩ @ VGS=10V
  RDS(ON) <7mΩ @ VGS=4.5V
- Surface Mount Package
- Lead Free and Green Devices available(RoHS Compliant)

Application

- SMPS Synchronous Rectification.
- Load Switch.
- DC-DC Conversion



N-Channel MOSFET



PPAK-3*3-8

ABSOLUTE MAXIMUM RATINGS(TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Diode Continuous Forward Current	I_S (T_A=25℃)	1	A
Pulsed Drain Current(Note 1)	I_{DM} (T_A=25℃)	55	A
Drain Current @ Continuous	I_D (T_A=25℃)	14	A
	I_D (T_A=70℃)	11	A
Maximum Power Dissipation(Note 2)	P_D(T_A=25℃)	1.6	W
	P_D(T_A=70℃)	1	
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$ (t≤10s)	36	℃/W
	$R_{\theta JA}$ (Steady State)	78	
Maximum Operating Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 To 150	℃

Note 1: Pulse width is limited by max. junction temperature.

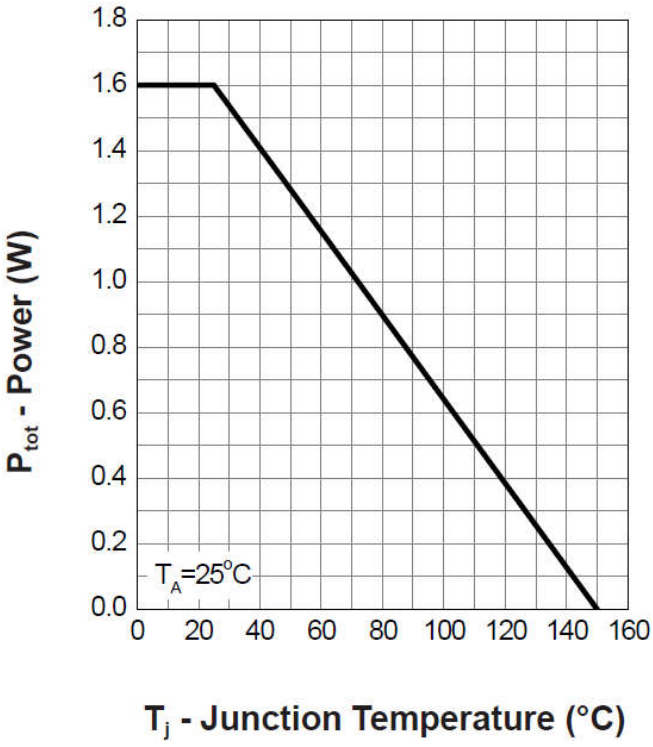
Note 2: Surface mounted on 1in^2 pad area, steady state t = 999s.

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

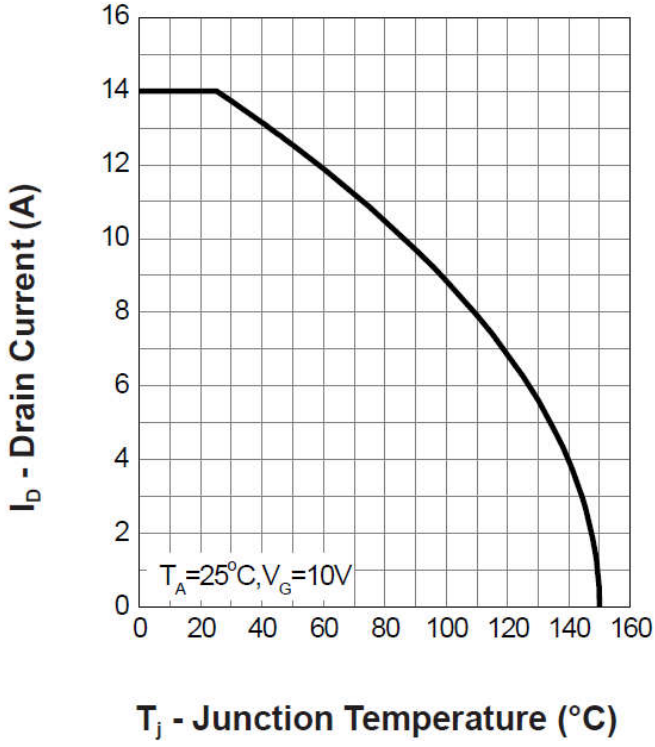
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=250μA	1.3	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=14A	-	4.1	4.9	mΩ
		T_J=125℃	-	6.4	-	
		V_{GS}=4.5V, I_D=12A	-	5.4	7	
Dynamic Characteristics(Guaranteed by design)						
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1	2	Ω
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V, F=1.0MHz	-	1575	2048	PF
Output Capacitance	C_{oss}		-	382	-	PF
Reverse Transfer Capacitance	C_{rss}		-	47	-	PF
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=20V, R_L=20Ω, V_{GEN}=10V,R_G=6Ω I_{DS}=1A	-	14.4	26	nS
Turn-on Rise Time	t_r		-	9.3	17	nS
Turn-Off Delay Time	$t_{d(off)}$		-	34	62	nS
Turn-Off Fall Time	t_f		-	24.7	45	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=14A,V_{GS}=10V	-	26.2	36.7	nC
Total Gate Charge	Q_g	V_{DS}=20V,I_D=14A,V_{GS}=4.5V	-	12.4	-	nC
Gate-Source Charge	Q_{gs}		-	4.5	-	nC
Gate-Drain Charge	Q_{gd}		-	3.6	-	nC
Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=20A	-	0.81	1.1	V
Reverse Recovery Time	T_{rr}	I_F=14A, dI/dt=100A/μs	-	26	-	nS
Charge Time	T_a		-	15	-	nS
Discharge Time	T_b		-	11	-	nS
Reverse Recovery Charge	Q_{rr}		-	18.5	-	nC

Typical Operating Characteristics

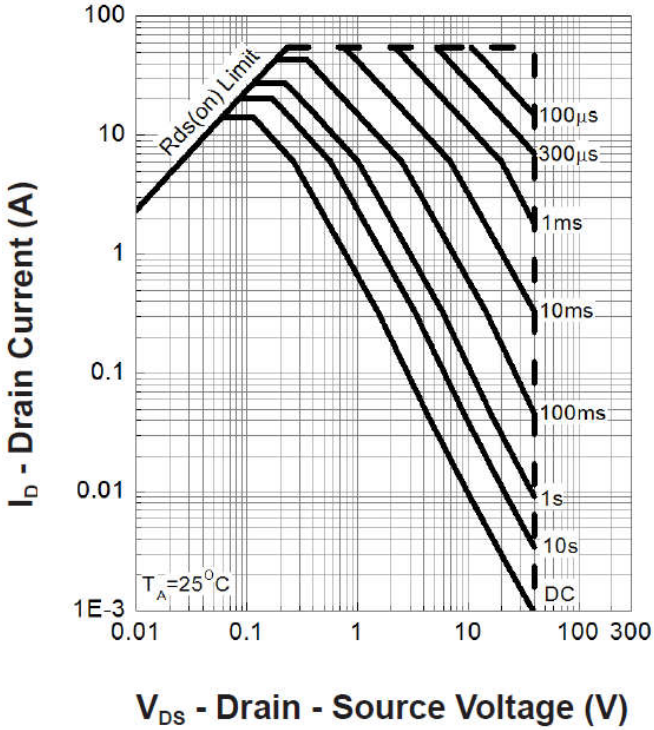
Power Dissipation



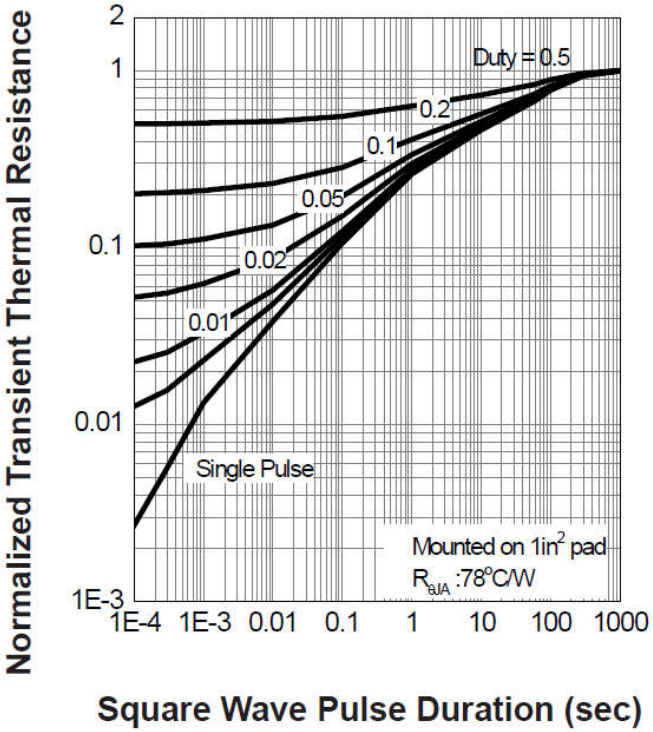
Drain Current



Safe Operation Area

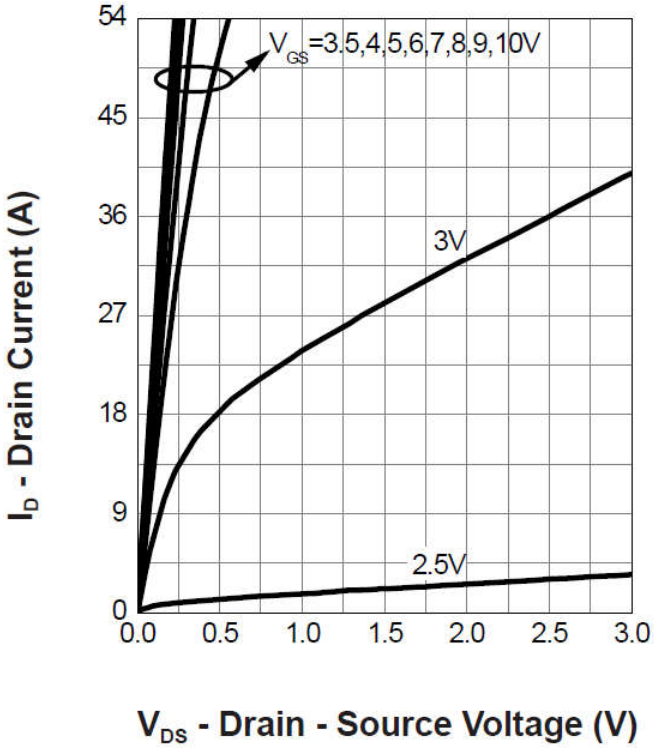


Thermal Transient Impedance

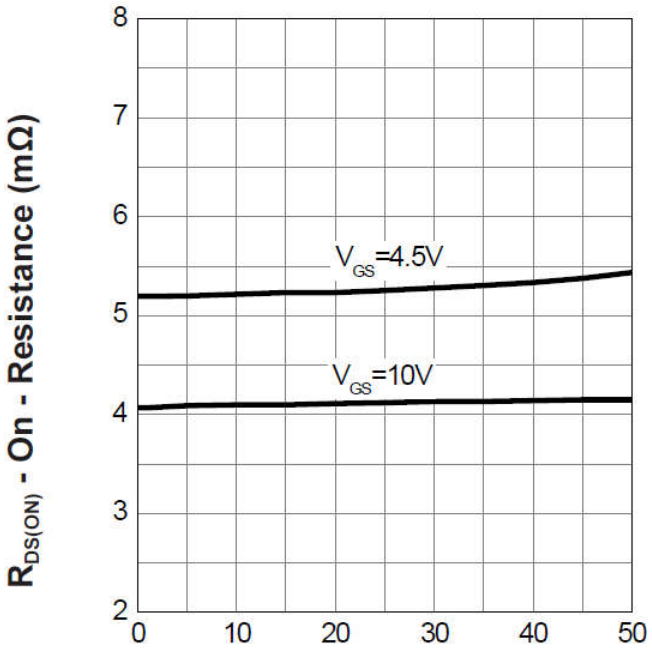


Typical Operating Characteristics(Cont.)

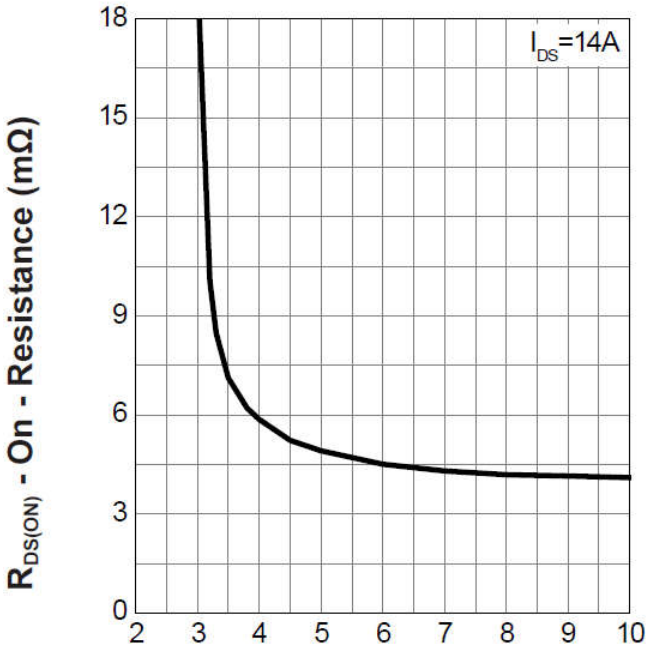
Output Characteristics



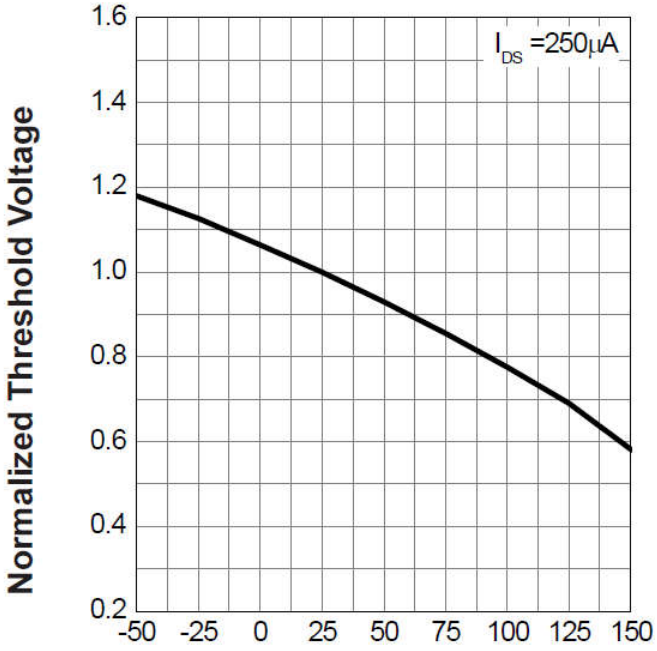
Drain-Source On Resistance



Gate-Source On Resistance

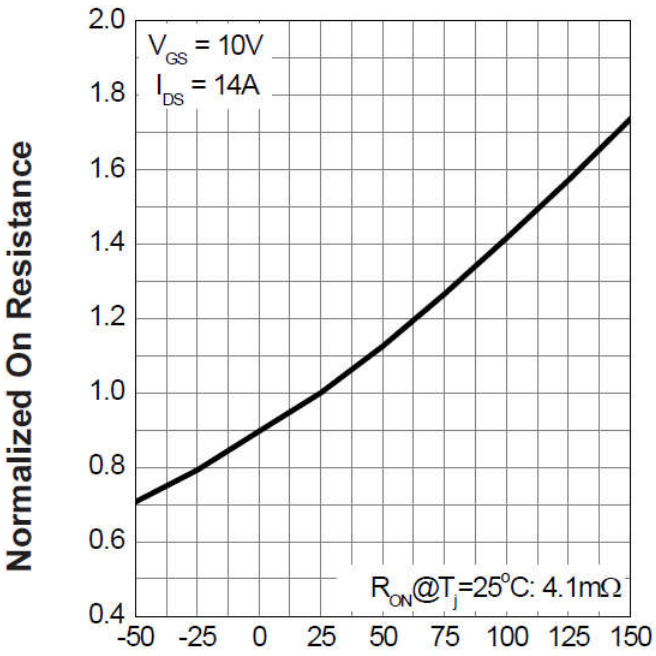


Gate Threshold Voltage

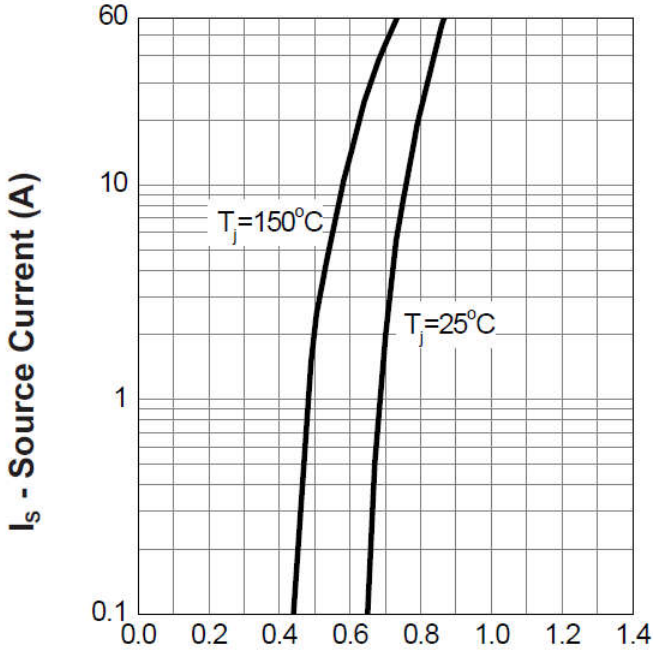


Typical Operating Characteristics (Cont.)

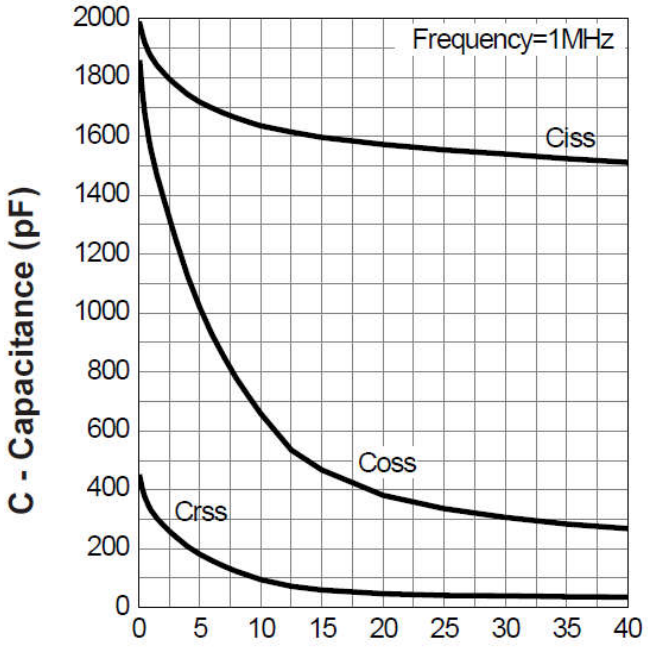
Drain-Source On Resistance



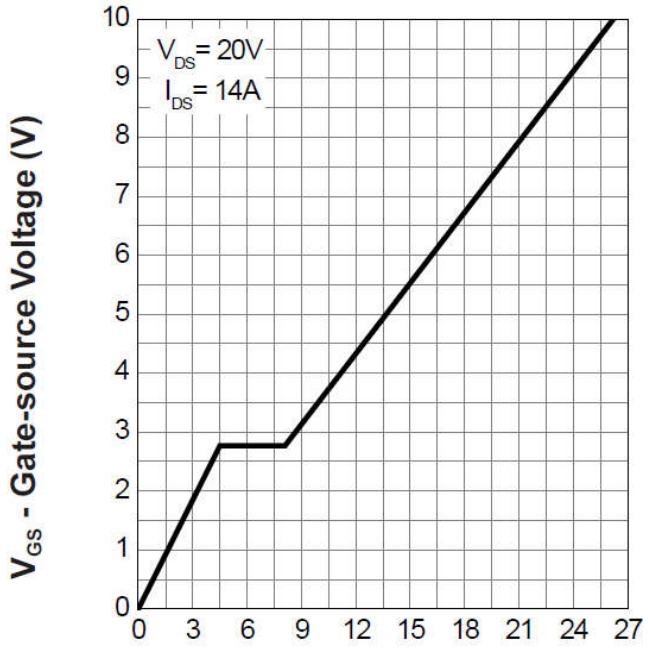
Source-Drain Diode Forward



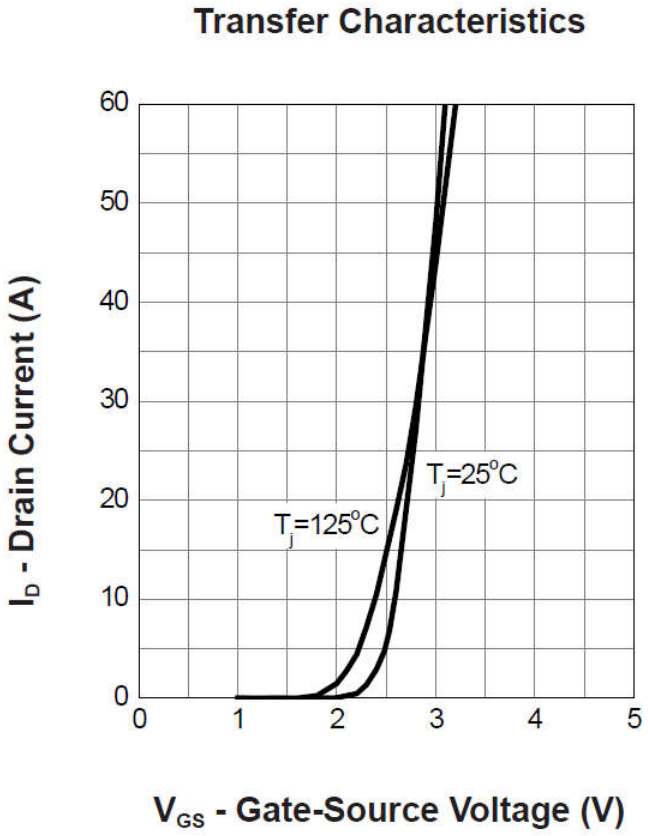
Capacitance



Gate Charge

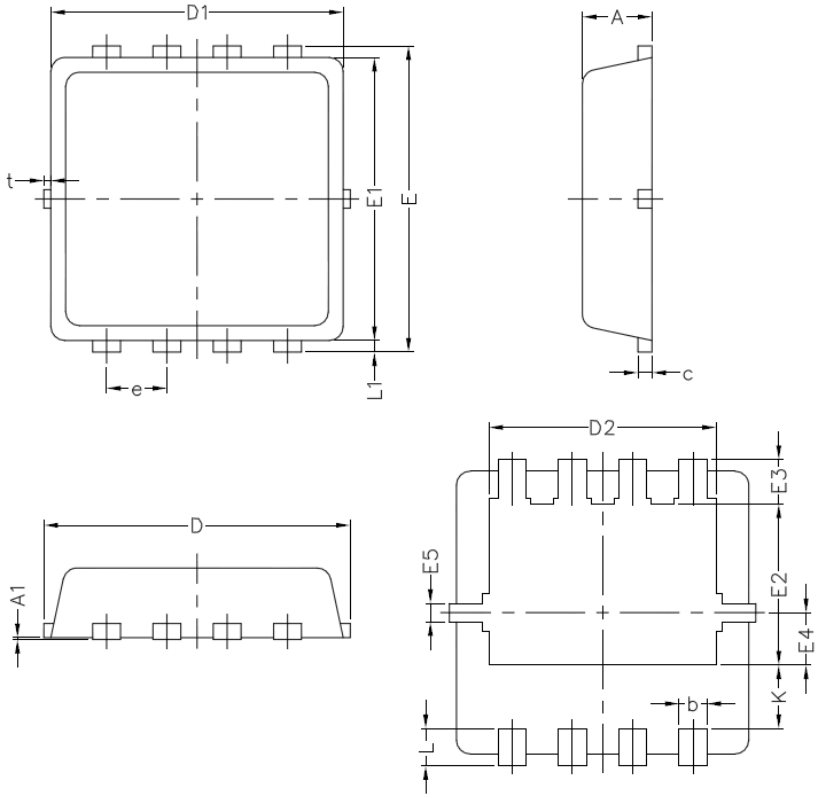


Typical Operating Characteristics (Cont.)



Package Information

PPAK-3*3-8 Package



Symbol	PPAK-3*3-8(mm)		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.3	3.45
D1	3.00	3.15	3.30
D2	2.25	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.68
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.49	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	/	/	0.13

Design Notes