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TPM1019ND6-1

20V N-Channel Enhancement Mode Power MOSFET

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Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D max T_A = +25°C
20V	9mΩ @ V_{GS} = 4.5V	15.2A
	15mΩ @ V_{GS} = 2.5V	13.8A

Application

- General Purpose Interfacing Switch
- Power Management Functions

Ordering Information

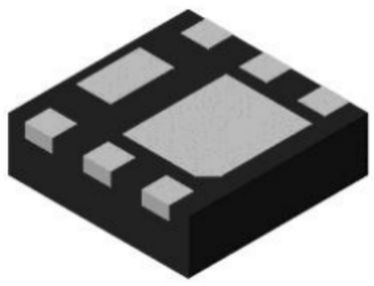
- Shipping Qty:3000 /7inch Tape& Reel

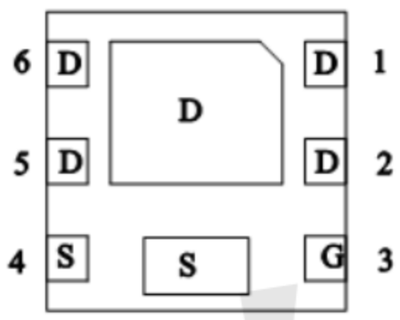
Features

- 0.6mm Profile – Ideal for Low Profile Applications
- PCB Footprint of 4mm²
- Low Gate Threshold Voltage
- Low On-Resistance

Package and Pin Configuration

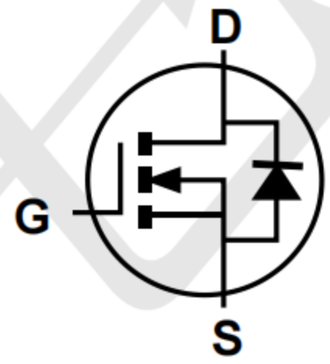
DFN2X2





Pin Out
Bottom View

Circuit diagram



Marking:1019D

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current (Note 6) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	11.6 9.3	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	15.2 12.2	A
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%)			I_{DM}	70	A
Maximum Body Diode Continuous Current (Note 6)			I_S	2.1	A
Avalanche Current (Note 7) L = 0.1mH			I_{AS}	23	A
Avalanche Energy (Note 7) L = 0.1mH			E_{AS}	28	mJ

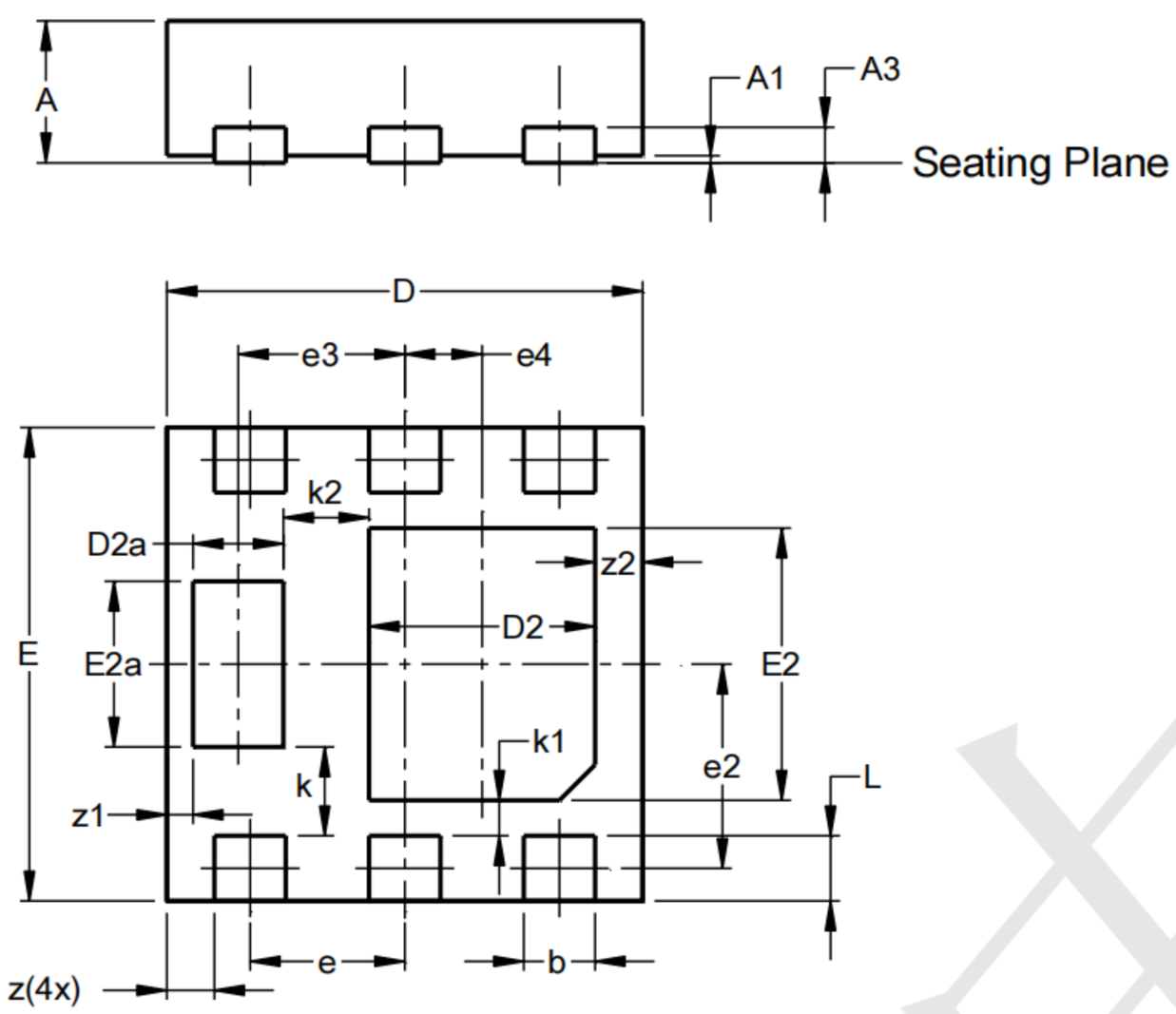
Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.8	W
	T_A = +70°C		0.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	159	°C/W
	t<10s		110	
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.8	W
	T_A = +70°C		1.2	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	70	°C/W
	t<10s		40	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	14	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (TA=25℃unless otherwise noted)

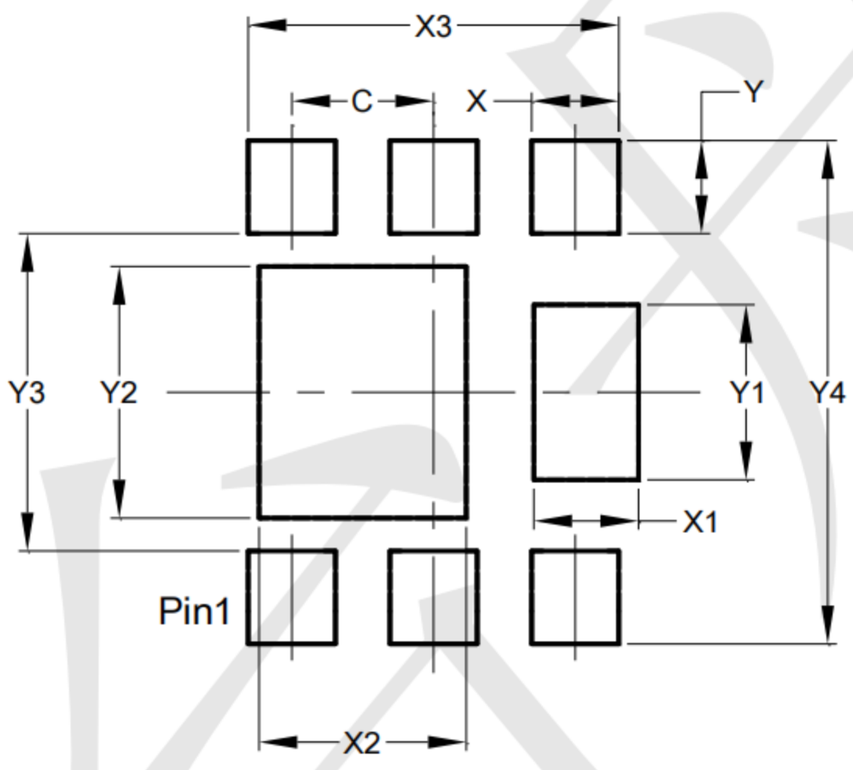
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1	μA	V_{DS} = 16V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±8 V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.4	—	1.2	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	6.8	9	mΩ	V_{GS} = 4.5V, I_D = 8.5A
			7.6	15		V_{GS} = 2.5V, I_D = 8.5A
			11	30		V_{GS} = 1.8V, I_D = 5A
			18	50		V_{GS} = 1.5V, I_D = 3A
Diode Forward Voltage	V_{SD}	—	0.75	1.2	V	V_{GS} = 0V, I_S = 8.5A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1439	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	224	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	202	—	pF	
Gate Resistance	R_g	—	1.3	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	19.3	—	nC	V_{DS} = 10V, I_D = 8.5A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	42.3	—	nC	
Gate-Source Charge	Q_{gs}	—	2.5	—	nC	
Gate-Drain Charge	Q_{gd}	—	4.5	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.7	—	ns	V_{DS} = 10V, I_D = 8.5A V_{GS} = 4.5V, R_G = 1.8Ω
Turn-On Rise Time	t_R	—	6.9	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	23	—	ns	
Turn-Off Fall Time	t_F	—	7.4	—	ns	
Reverse Recovery Time	t_{RR}	—	11.6	—	ns	I_F = 8.5A, di/dt = 210A/μs
Reverse Recovery Charge	Q_{RR}	—	4.6	—	nC	

DFN2X2 Package Outline Dimensions



(Type F)			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0.00	0.05	0.03
A3	-	-	0.15
b	0.25	0.35	0.30
D	1.95	2.05	2.00
D2	0.85	1.05	0.95
D2a	0.33	0.43	0.38
E	1.95	2.05	2.00
E2	1.05	1.25	1.15
E2a	0.65	0.75	0.70
e	0.65 BSC		
e2	0.863 BSC		
e3	0.70 BSC		
e4	0.325 BSC		
k	0.37 BSC		
k1	0.15 BSC		
k2	0.36 BSC		
L	0.225	0.325	0.275
z	0.20 BSC		
z1	0.110 BSC		
z2	0.20 BSC		
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	0.480
X2	0.950
X3	1.700
Y	0.425
Y1	0.800
Y2	1.150
Y3	1.450
Y4	2.300

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