WPT2N32

Single, PNP, -30V, -3A, Power Transistor with 20V N-MOSFET

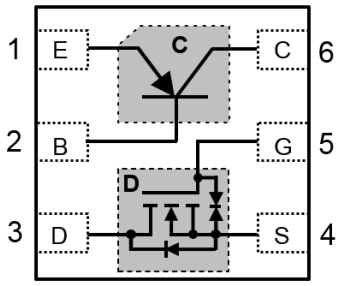
Http://www.sh-willsemi.com

Descriptions

The WPT2N32 is PNP bipolar power transistor with 20V N-MOSFET. This device is suitable for use in charging circuit and other power management.

Standard Product WPT2N32 is Pb-free.

DFN2*2-6L



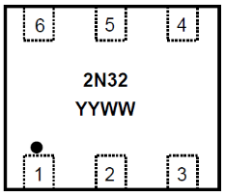
Pin configuration (Top view)

Features

- Ultra low collector-to-emitter saturation voltage
- High DC current gain >100
- 3A pulse collector current
- Small package DFN2x2-6L

Applications

- Charging circuit
- Other power management in portable equipments



2N32 = Device Code
YY =Year
WW =Week

Marking

Order information

Device	Package	Shipping
WPT2N32-6/TR	DFN2*2-6L	3000/Reel&Tape

Absolute Maximum ratings

Parameter	Symbol	Value	Unit
PNP Transistor			
Collector-emitter voltage	V_{CEO}	-30	V
Collector-base voltage	V_{CBO}	-30	V
Emitter-base voltage	V_{EBO}	-6	V
Pulse collector current[c]	I_C	-3	A
Pulse collector current	I_{CM}	-6	A
N-MOSFET			
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±6	V
Continuous Drain Current[a]	I_D	1.2	A
Continuous Drain Current[b]		0.7	A
Pulsed Drain Current	I_{DM}	6	A
Power Dissipation and temperature			
Power dissipation[a]	P_D	1.24	W
Power dissipation[b]		0.45	W
Junction Temperature	T_J	150	°C
Lead Temperature	T_L	260	°C
Operation Temperature	T_A	-40~85	℃
Storage Temperature Range	T_{stg}	-55～155	°C

Thermal resistance ratings

Single Operation					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance[a]	t≤10 s	$R_{\theta JA}$	56	67	°C/W
	Steady State		84	101	
Junction-to-Ambient Thermal Resistance[b]	t≤10 s	$R_{\theta JA}$	157	189	
	Steady State		234	281	

Note:

a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm^2 area)

b FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) minimum pad covered with copper

c Repetitive rating, ~10s pulse width, duty cycle ~90%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

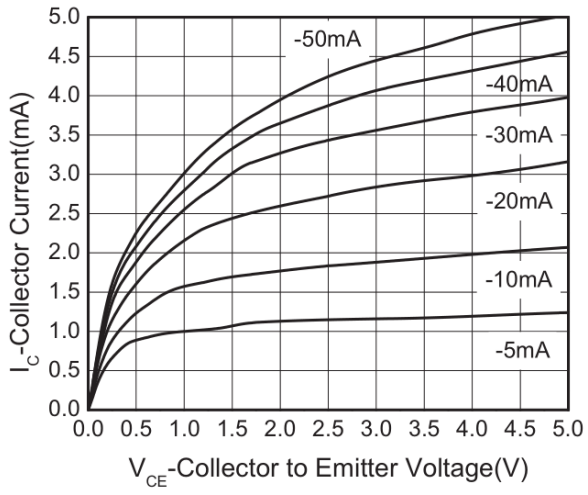
d The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

Electronics Characteristics (Ta=25°C, unless otherwise noted)

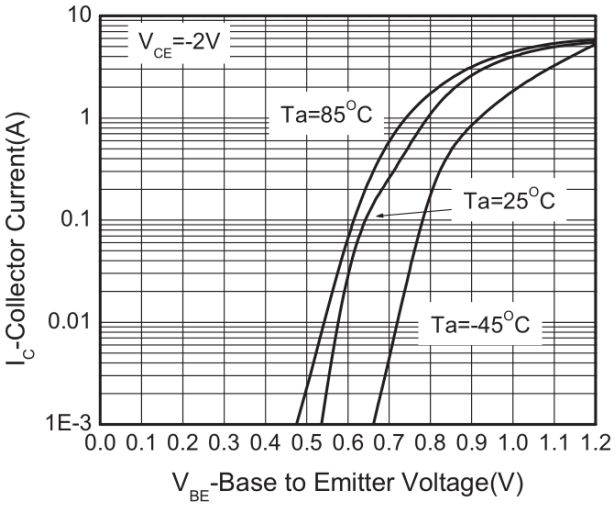
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
PNP Transistor						
Collector-emitter breakdown voltage	BV_{CEO}	Ic = -10mA, I_B = 0mA	-32			V
Collector-base breakdown voltage	BV_{CBO}	Ic = -1mA, I_E = 0mA	-32			V
Emitter-base breakdown voltage	BV_{EBO}	I_E = -100uA, Ic = 0mA	-6			V
Collector cutoff current	I_{CBO}	V_{CB} = -30V			-100	nA
Emitter cutoff current	I_{EBO}	V_{EB} = -5V			-100	nA
Collector-emitter saturation voltage	$V_{CE(SAT)}$	I_C=-0.5A, I_B=-5mA		-100	-350	mV
		I_C = -2A, I_B = -200mA		-200	-400	mV
Base-emitter saturation voltage	$V_{BE(SAT)}$	I_C=-2A, I_B = -200mA		-1	-1.5	V
Base-emitter forward voltage	$V_{BE(on)}$	I_C = -0.5A, V_{CE} = -2V		-0.7	-1.1	V
DC current gain	HFE	I_C = -1A, V_{CE} = -2V	100		300	
N-MOSFET						
Drain-Source Breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			100	nA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±5V			±1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.45	0.55	0.86	V
Drain-to-source On-Resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 0.55A		205	600	mΩ
		V_{GS} = 2.5V , I_D= 0.50A		295	650	mΩ
		V_{GS} = 1.8V, I_D = 0.35A		320	700	mΩ
Input Capacitance	C_{ISS}	V_{DS} = 10 V		61		pF
Output Capacitance	C_{OSS}	V_{GS} = 0 V		17		pF
Reverse Transfer Capacitance	C_{RSS}	f = 1MHz		10		pF
Total Gate Charge	$Q_{G(TOT)}$	V_{DD} = 10 V V_{GS} = 4.5 V I_D = 0.6 A		1.15		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.06		nC
Gate-to-Source Charge	Q_{GS}			0.15		nC
Gate-to-Drain Charge	Q_{GD}			0.23		nC
Turn-On Delay Time	td(on)	V_{GS} = 4.5 V V_{DD} = 10 V I_D= 0.5 A R_L = 10 Ω R_G = 6 Ω		33		ns
Rise Time	tr			102		ns
Turn-Off Delay Time	td(off)			790		ns
Fall Time	tf			439		ns
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 0.35A	0.5	0.7	1.1	V

Typical Characteristics (Ta=25ºC, unless otherwise noted)

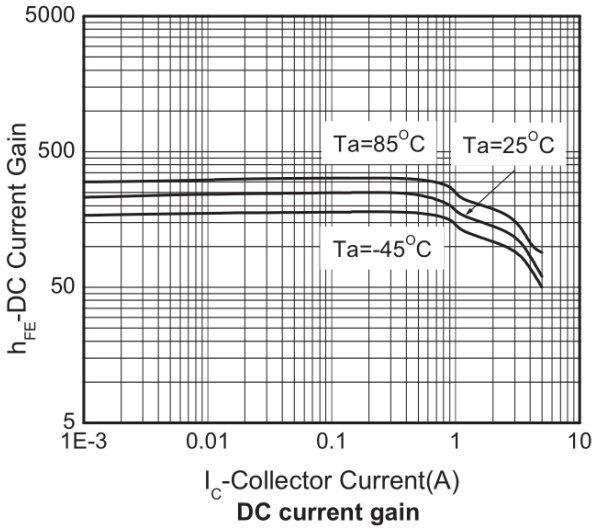
PNP Transistor



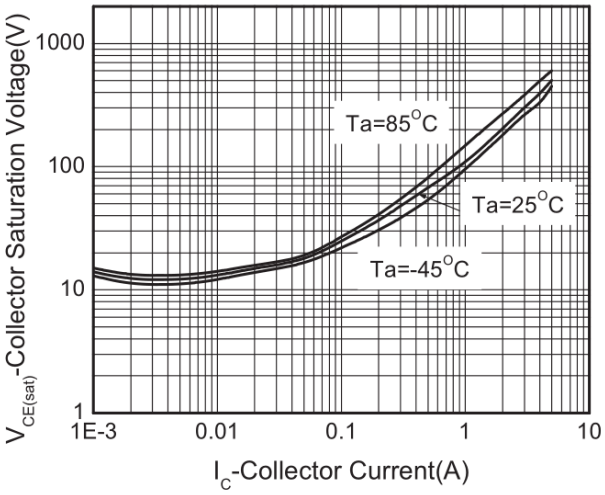
Output characteristics



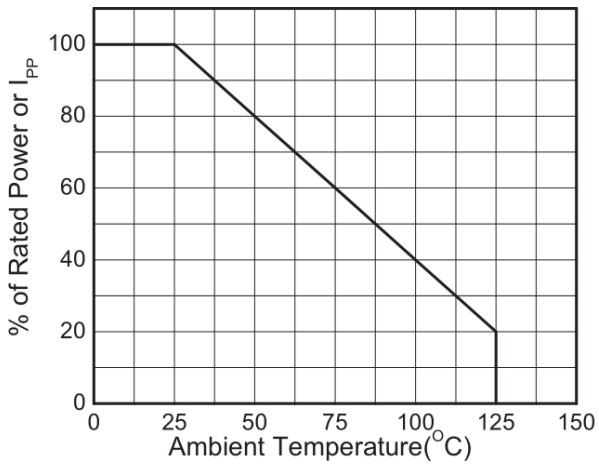
Transfer characteristics



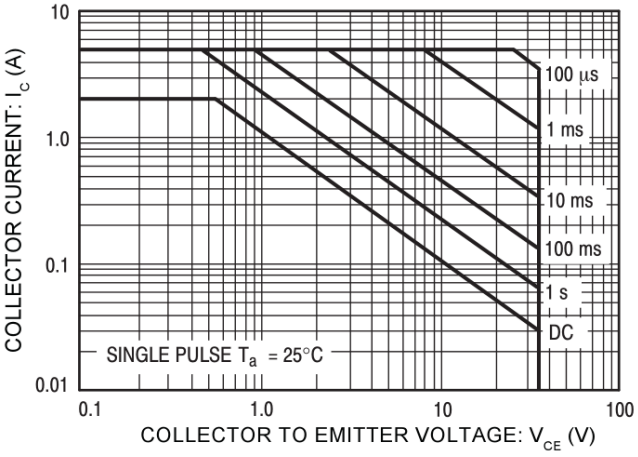
DC current gain



C-E saturation voltage vs. Collector current

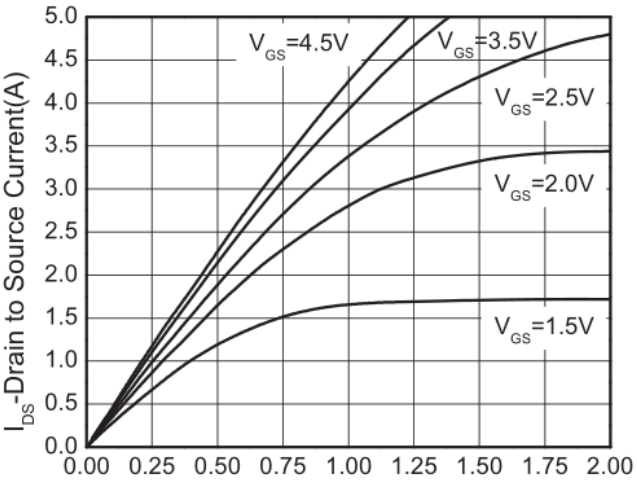


Power Derating

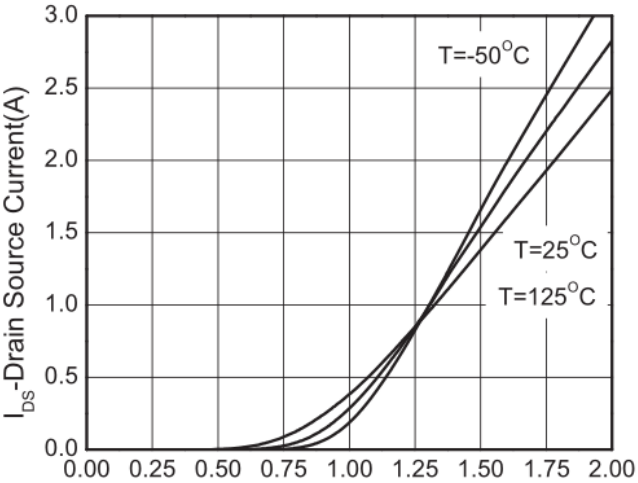


Safe operating area

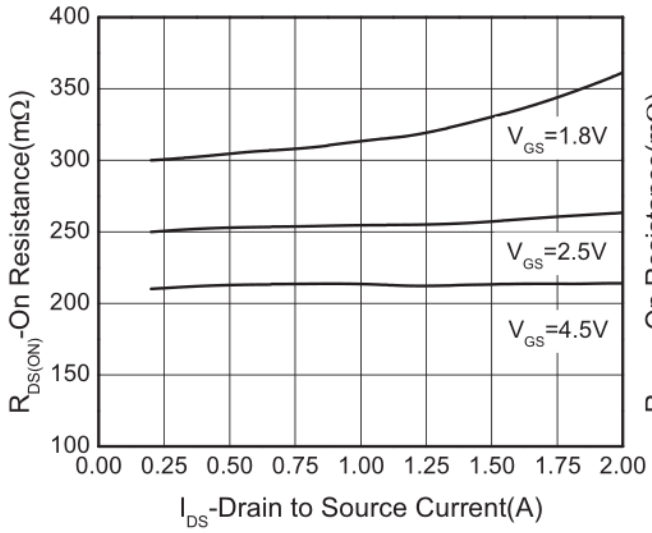
N-MOSFET



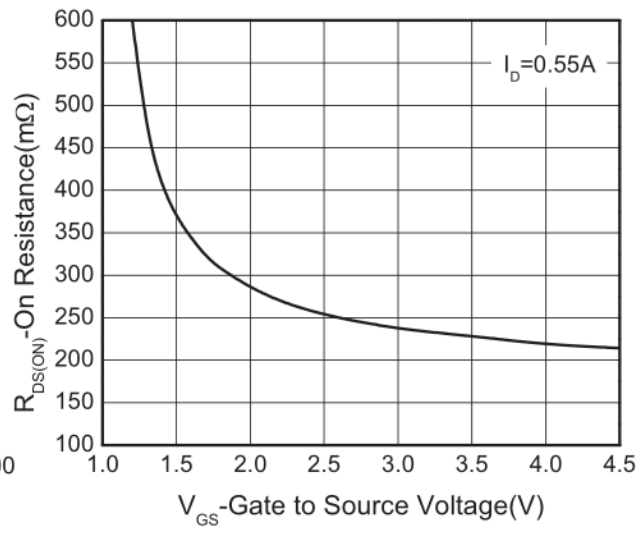
Output Characteristics



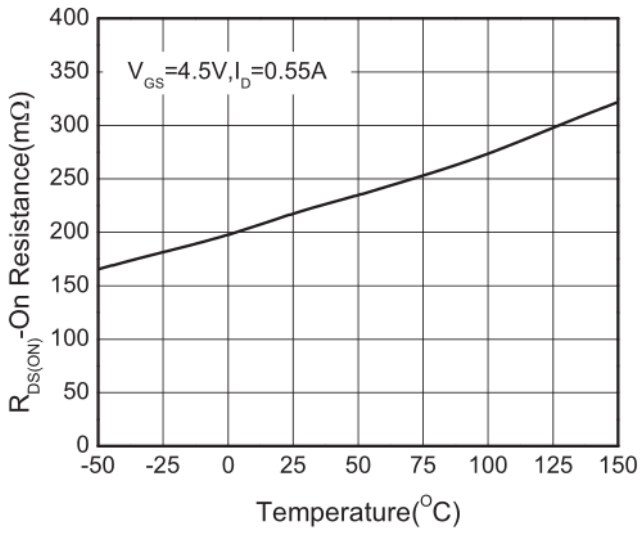
Transfer Characteristics



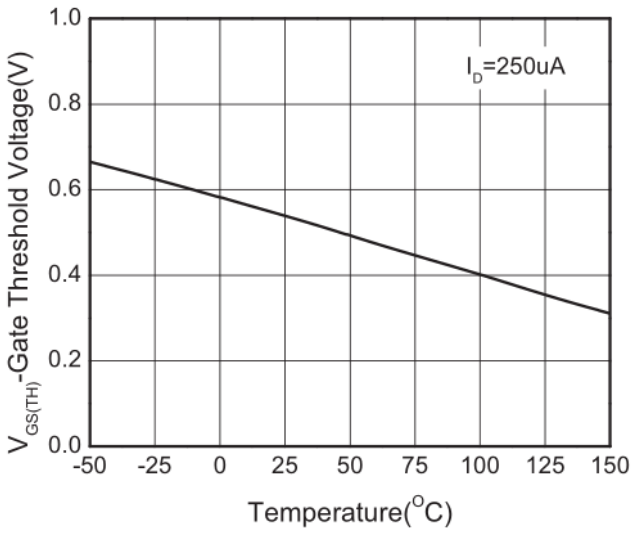
ON Resistance vs. Drain Current



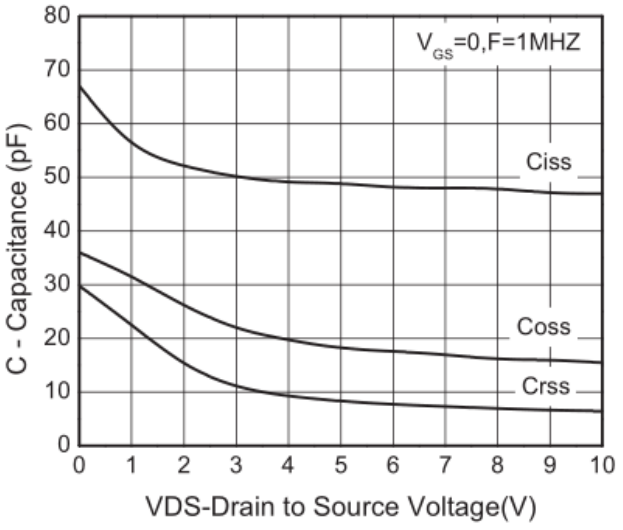
ON Resistance vs. Gate-to-Source Voltage



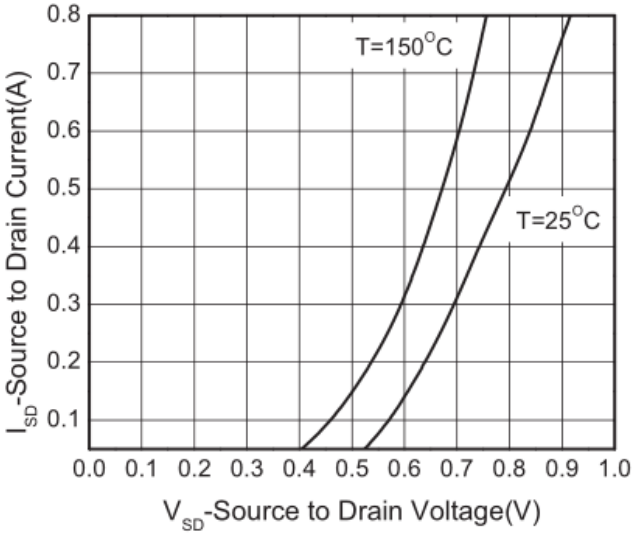
ON Resistance vs. Junction Temperature



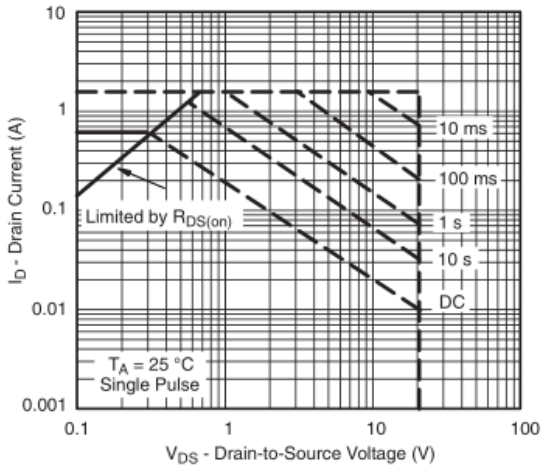
Threshold Voltage vs. Temperature



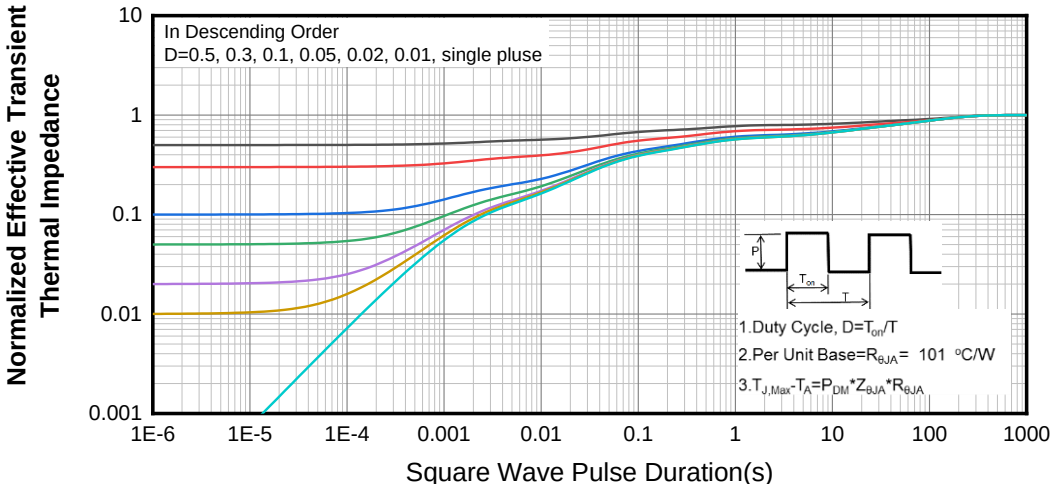
Capacitance



Body Diode Characteristics



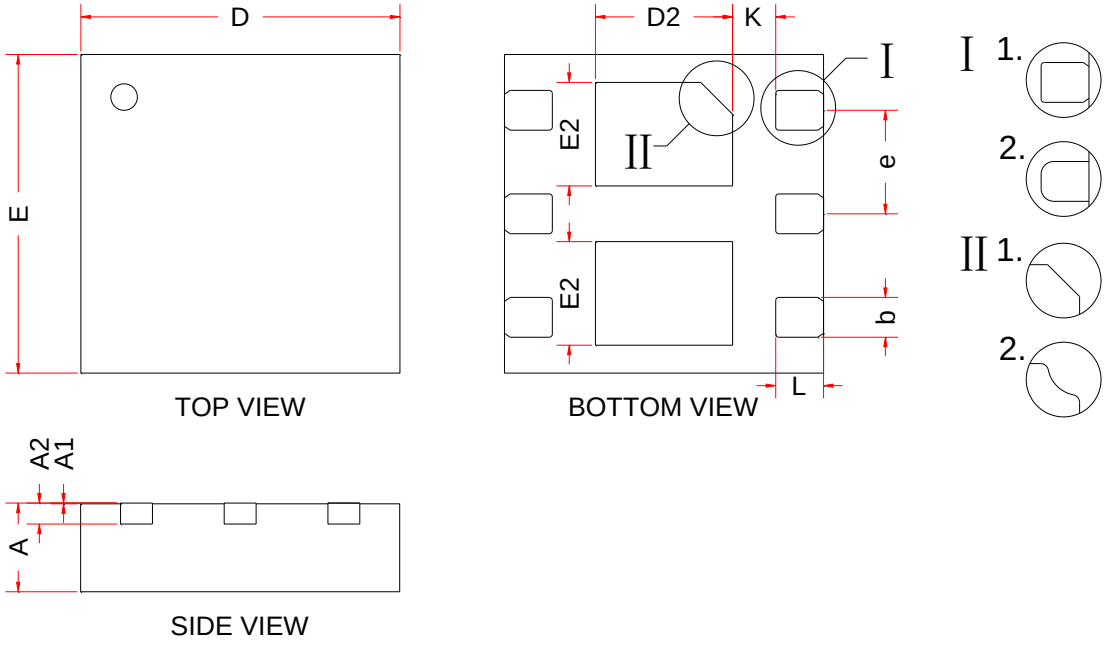
Safe Operation Area



Transient thermal response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

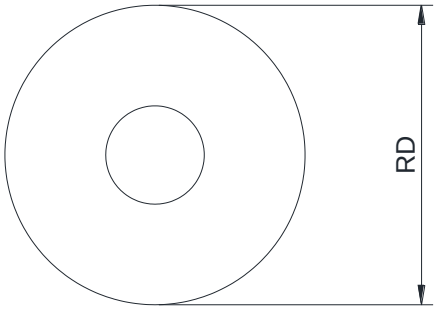
DFN2x2-6L



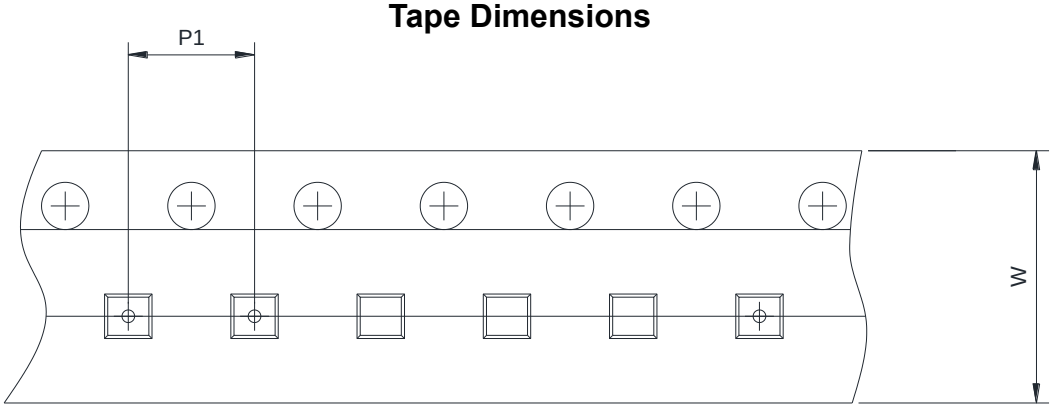
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A2	0.203 Ref		
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D2	0.76	-	1.10
E2	0.44	-	0.75
b	0.20	-	0.35
L	0.17	-	0.38
K	0.17	-	-
e	0.65 BSC		

TAPE AND REEL INFORMATION

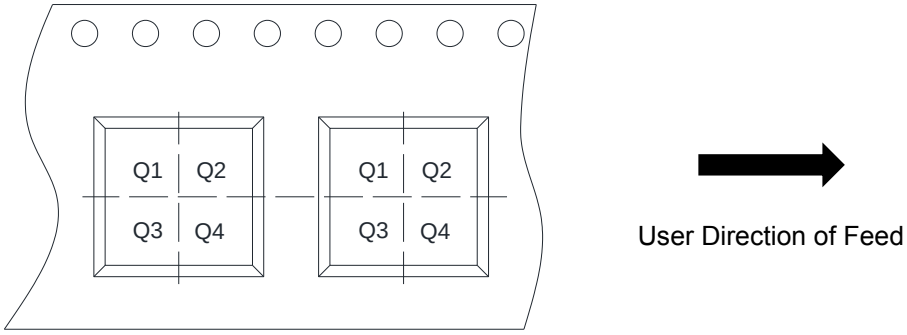
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm	☐ 16mm	
P1	Pitch between successive cavity centers	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☐ Q1	☑ Q2	☐ Q3	☐ Q4