

**WPT2N32**

Single, PNP, -30V, -1A, Power Transistor with 20V N-MOSFET

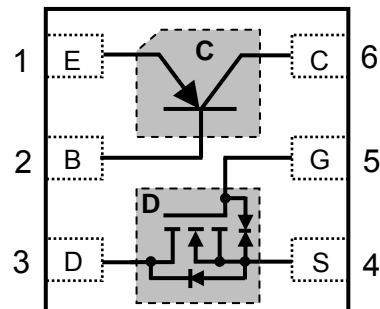
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**Descriptions**

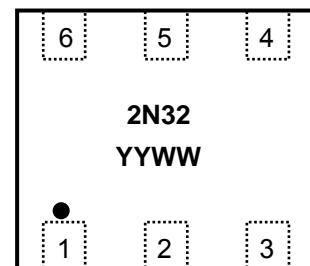
The WPT2N32 is PNP bipolar power transistor with 20V N-MOSFET. This device is suitable for use in charging circuit and other power management. Standard Product WPT2N32 is Pb-free.



**DFN2x2-6L**



**Pin configuration (Top view)**



2N32 = Device code  
 YY = Year  
 WW = Week  
**Marking**

**Features**

- Ultra low collector-to-emitter saturation voltage
- High DC current gain >100
- 1A continue collector current
- Small package DFN2x2-6L

**Applications**

- Charging circuit
- Other power management in portable equipments

**Order information**

Device	Package	Shipping
WPT2N32-6/TR	DFN2x2-6L	3000/Reel&Tape

**Absolute maximum ratings**

Parameter	Symbol	Value	Unit
<b>PNP Transistor</b>			
Collector-emitter voltage	$V_{CEO}$	-30	V
Collector-base voltage	$V_{CBO}$	-30	V
Emitter-base voltage	$V_{EBO}$	-6	V
Continues collector current <sup>b</sup>	$I_C$	-1	A
Pulse collector current <sup>c</sup>	$I_{CM}$	-3	A
<b>N-MOSFET</b>			
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 6$	V
Continuous Drain Current <sup>a</sup>	$I_D$	0.80	A
Continuous Drain Current <sup>b</sup>		0.69	A
Pulsed Drain Current <sup>c</sup>	$I_{DM}$	1.4	A
<b>Power Dissipation and temperature</b>			
Power dissipation <sup>a</sup>	$P_D$	1.1	W
Power dissipation <sup>b</sup>		0.6	W
Junction Temperature	$T_J$	150	°C
Lead Temperature	$T_L$	260	°C
Operation Temperature	$T_A$	-40 ~ 85	°C
Storage Temperature Range	$T_{stg}$	-55 to 150	°C

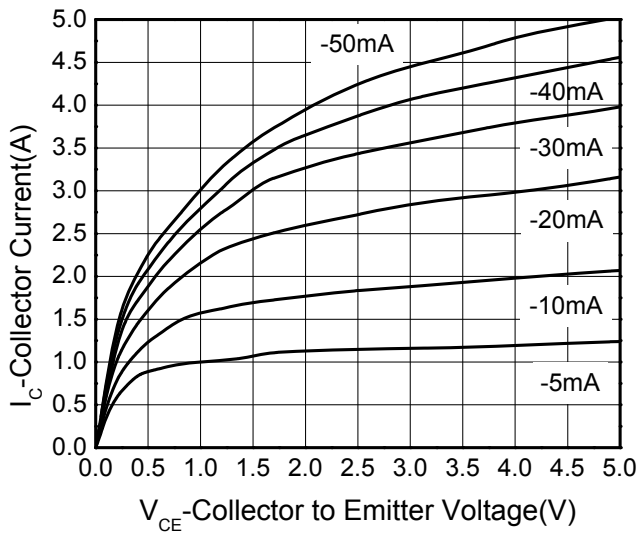
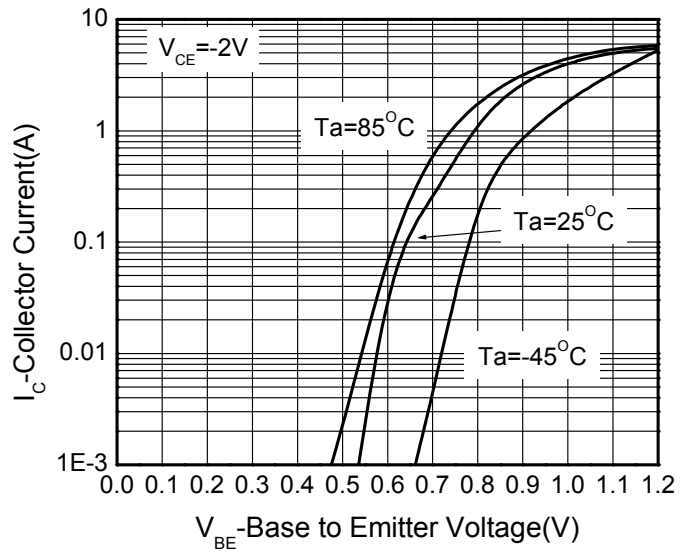
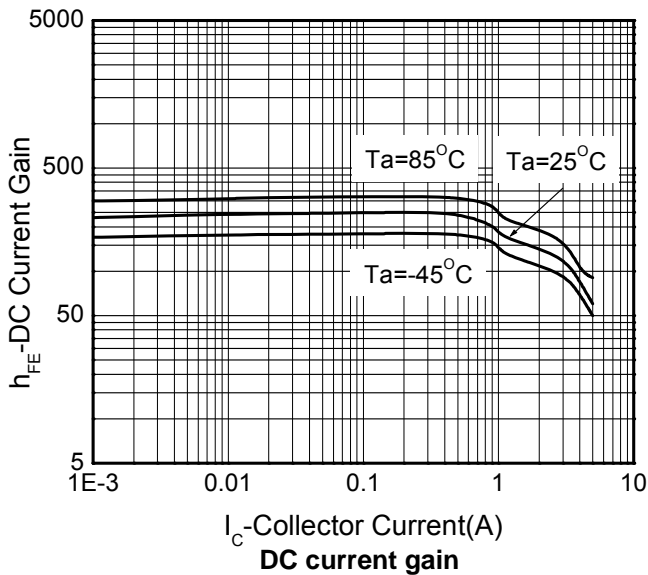
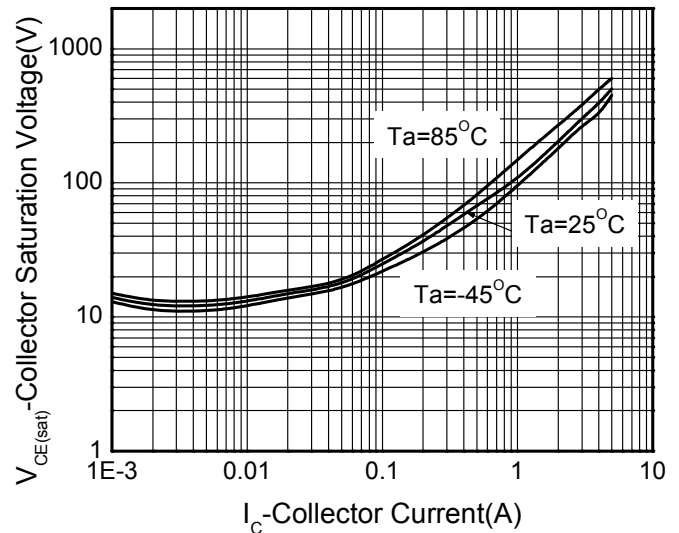
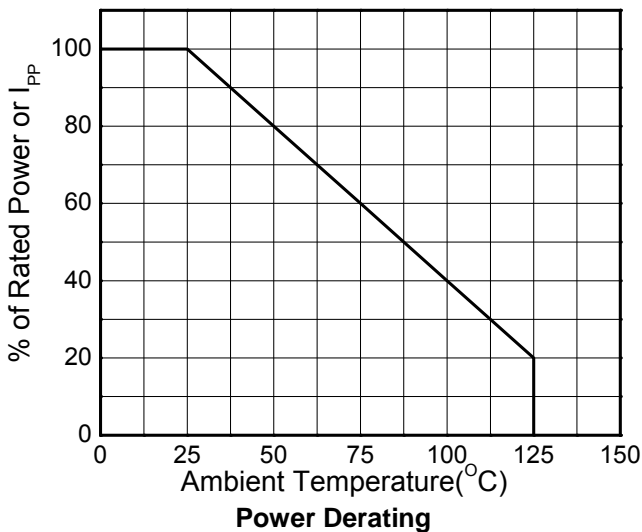
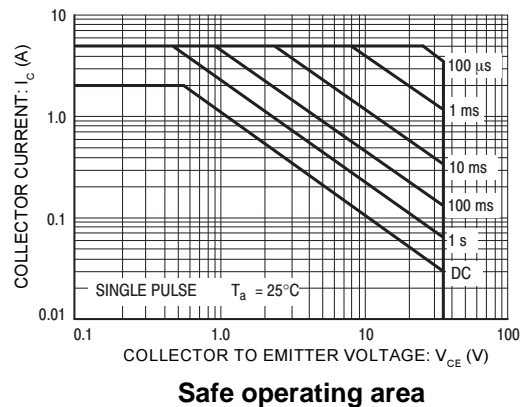
**Thermal resistance ratings**

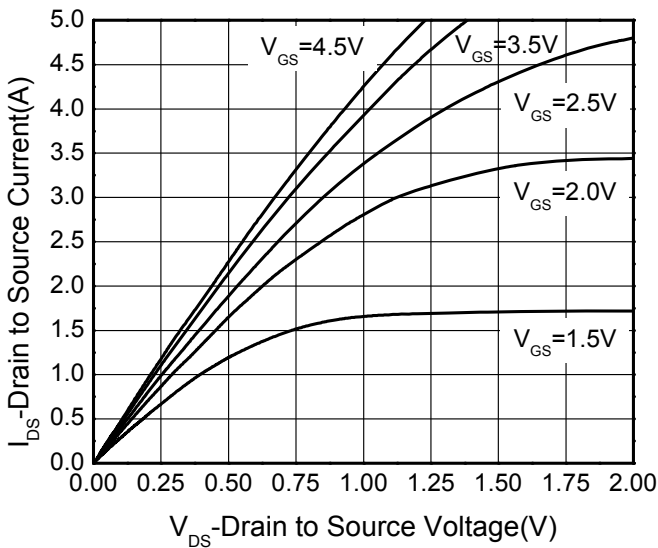
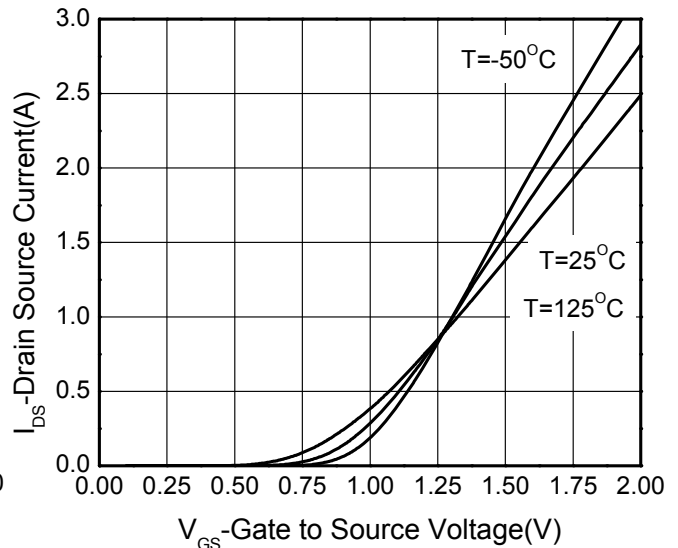
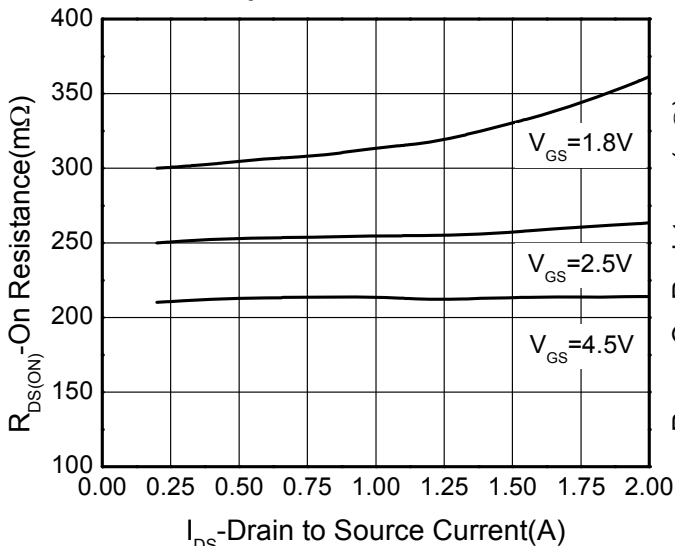
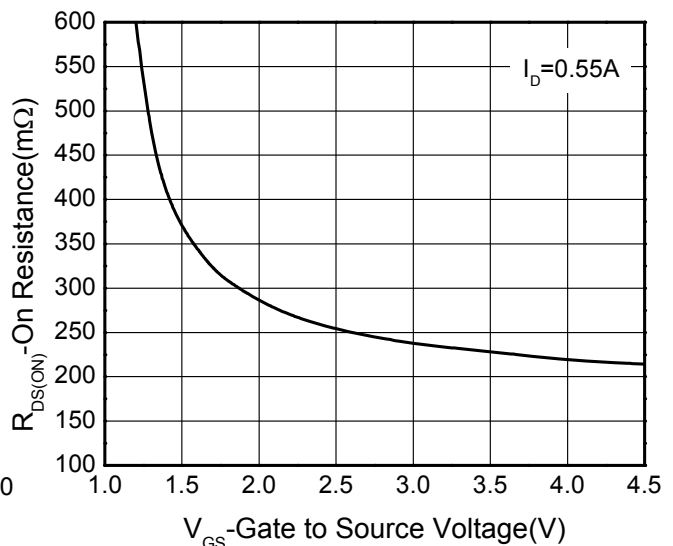
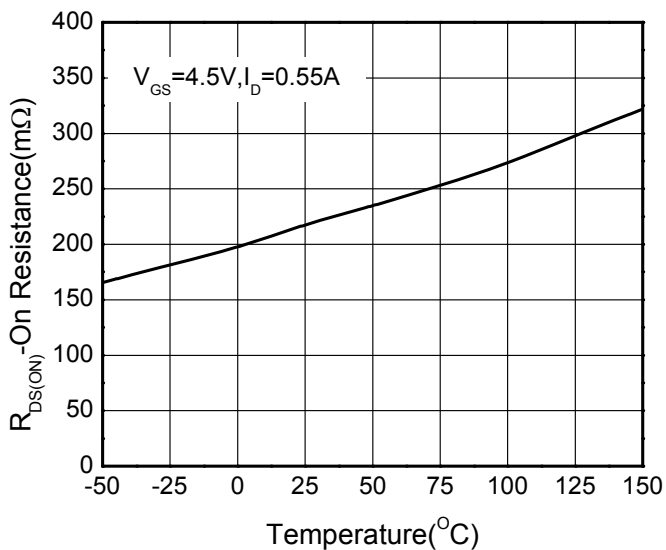
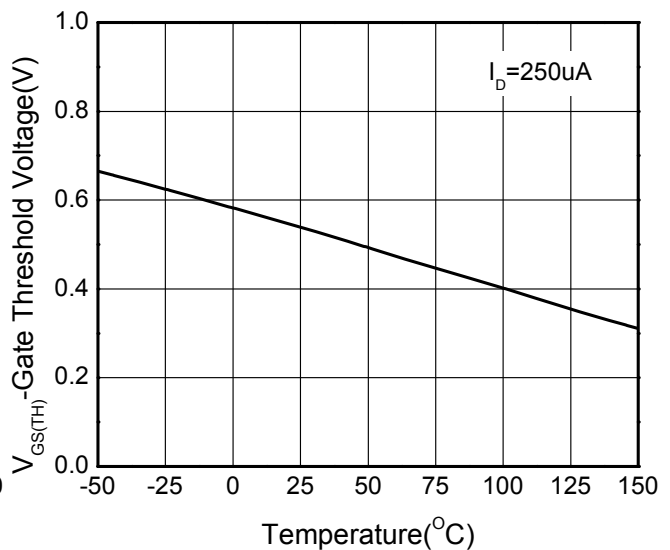
Parameter	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$R_{\theta JA}$	113	°C/W
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$R_{\theta JA}$	208	°C/W

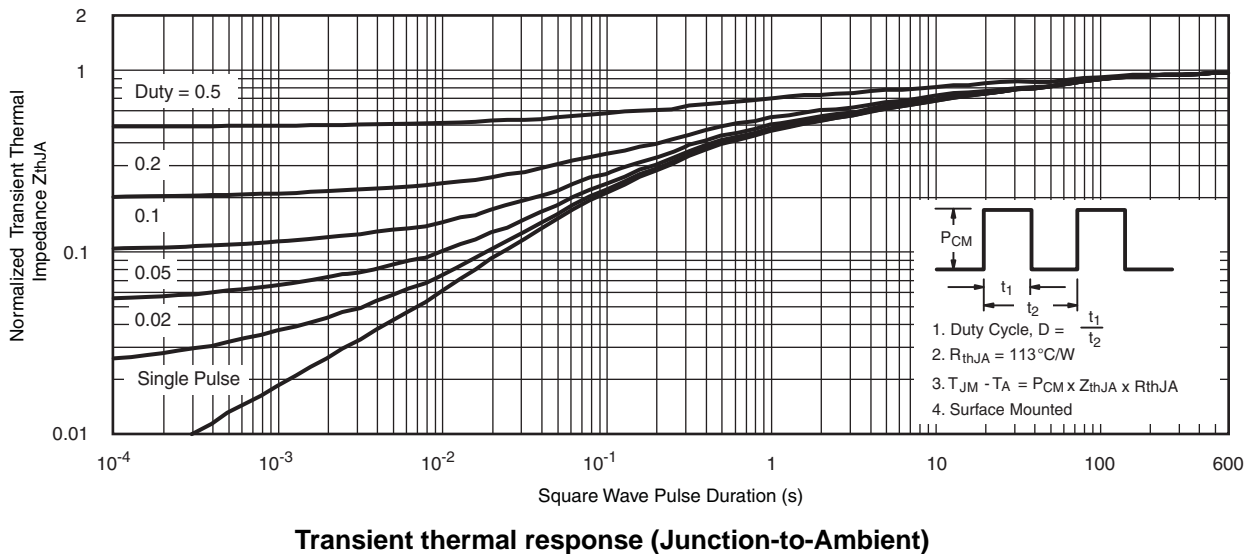
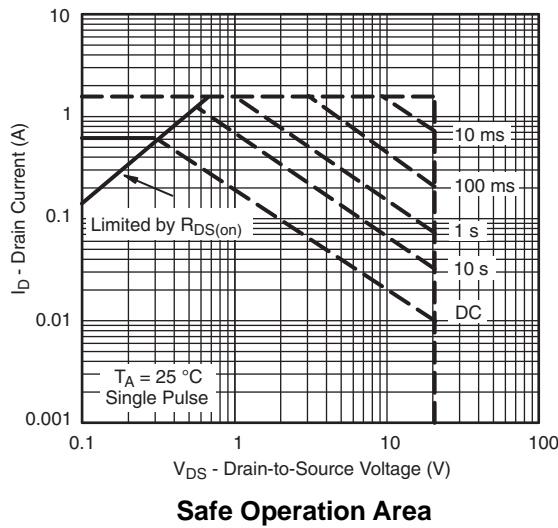
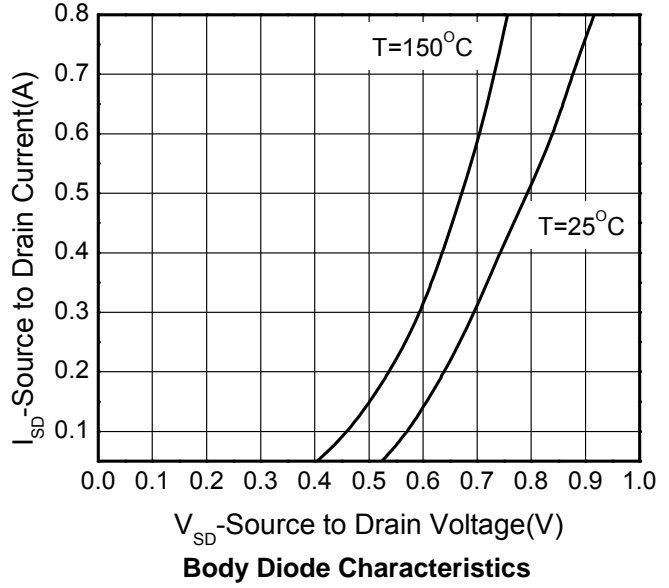
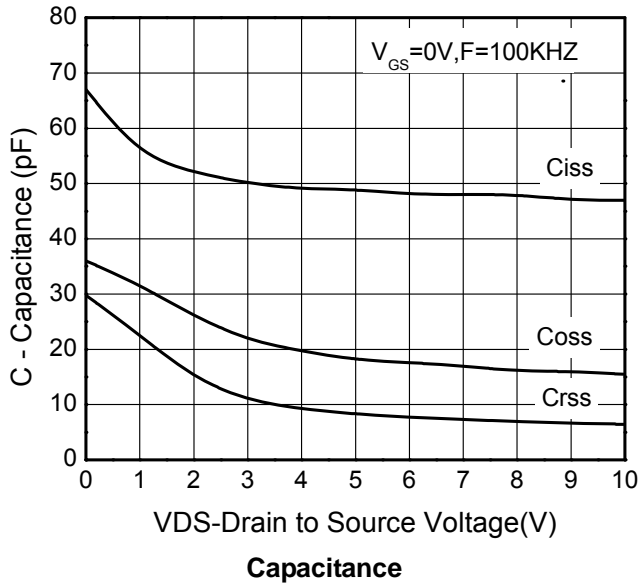
- a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper
- b Surface mounted on FR-4 board using minimum pad size, 1oz copper
- c Pulse width=300 $\mu$ s, Duty Cycle<2%
- d Maximum junction temperature  $T_J=150^\circ\text{C}$ .

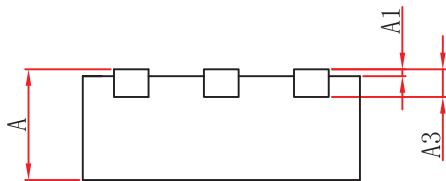
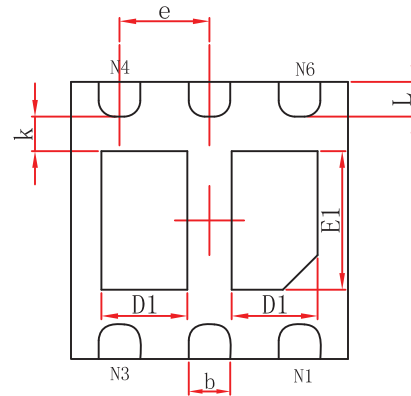
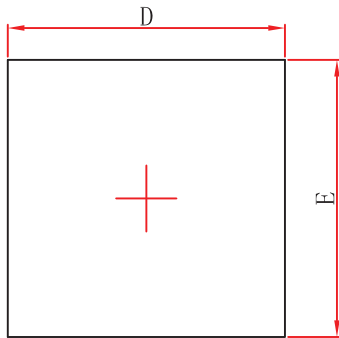
**Electronics Characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>PNP Transistor</b>						
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C=-10mA, I_B=0mA$	-32			V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C=-1mA, I_E=0mA$	-32			V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E=-100\mu A, I_C=0mA$	-6			V
Collector cutoff current	$I_{CBO}$	$V_{CB}=-30V, I_E=0$			-100	nA
Emitter cutoff current	$I_{EBO}$	$V_{EB}=-5V, I_C=0$			-100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-0.5A, I_B=-50mA$		-0.1	-0.35	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-0.5A, I_B=-50mA$		-0.9	-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	$h_{FE}$	$I_C=-0.5A, V_{CE}=-2V$	100		300	
<b>N-MOSFET</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V, V_{GS}=0V$			100	nA
Gate –Source leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 5V$			$\pm 1$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.44	0.55	0.86	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=0.55A$		205	600	m $\Omega$
		$V_{GS}=2.5V, I_D=0.50A$		295	650	m $\Omega$
		$V_{GS}=1.8V, I_D=0.35A$		320	700	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V,$		61		pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V,$		17		pF
Reverse Transfer Capacitance	$C_{rss}$	$F=100KHZ$		10		pF
Total Gate Charge	$Q_{G(TOT)}$	$V_{DS}=10V,$ $V_{GS}=4.5V,$ $I_D=0.6A$		1.15		nC
Threshold gate charge	$Q_{G(TH)}$			0.06		nC
Gate-Source Charge	$Q_{GS}$			0.15		nC
Gate-Drain Charge	$Q_{GD}$			0.23		nC
Turn-On Delay Time	$t_{d(on)}$			33		ns
Turn-On Rise Time	$t_r$	$V_{DD}=10V, V_{GS}=4.5V,$ $I_D=0.5A,$		102		ns
Turn-Off Delay Time	$t_{d(off)}$	$R_L=10\Omega, R_G=6\Omega$		790		ns
Turn-Off Fall Time	$t_f$			439		ns
Body Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.35A$	0.5	0.7	1.1	V

**Typical Characteristics (Ta=25°C, 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**



**Package outline dimensions**
**DFN2x2-6L**


Symbol	Dimension in Millimeters		
	Min.	Typ.	Max.
A	0.700	0.750	0.800
A1	0.000	0.025	0.050
A3	0.203REF		
D	1.900	2.000	2.100
E	1.900	2.000	2.100
E1	0.750	0.800	0.850
D1	0.600	0.650	0.700
k	0.200MIN		
b	0.250	0.300	0.350
e	0.650TYP		
L	0.250	0.300	0.350

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