

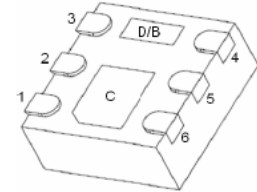
# KYMNT33

## PNP Power Transistor with N-MOSFET

### FEATURE

- Ultra low collector-to-emitter saturation voltage
- High DC current gain
- Small package DFNWB2×2-6L-I

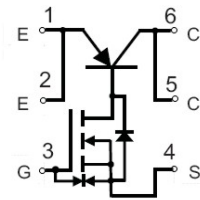
DFNWB2×2-6L-I



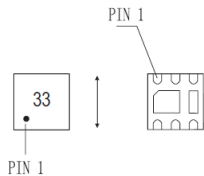
### APPLICATION

- Charging circuit
- Other power management in portable equipment

Equivalent circuit



### MARKING



### ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
<b>PNP Transistor</b>			
V <sub>CBO</sub>	Collector-Base Voltage	-32	V
V <sub>CEO</sub>	Collector-Emitter Voltage	-32	V
V <sub>EBO</sub>	Emitter-Base Voltage	-6	V
I <sub>C</sub>	Collector Current-Continuous(Note1)	-1.5	A
	Collector Current-Continuous(Note2)	-0.6	A
I <sub>CM</sub>	Collector Current-Pulse(Note3)	-4	A
<b>N-MOSFET</b>			
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±5	V
I <sub>D</sub>	Continuous Drain Current (note 1)	0.8	A
	Collector Current-Continuous(Note2)	0.69	A
I <sub>DM</sub>	Collector Current-Pulse(Note3)	1.4	A
<b>Power Dissipation, Temperature and Thermal Resistance</b>			
P <sub>D</sub>	PowerDissipation	0.7	W
P <sub>C</sub>	Power Dissipation (T <sub>c</sub> =25°C ,Note1)	2.5	W
R <sub>θJA</sub>	Thermal Resistance from Junction to Ambient	178.6	°C/W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C
T <sub>L</sub>	Lead Temperature	260	°C

# KYMNT33

## ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>PNP Transistor</b>						
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-1\text{mA}, I_E=0$	-32			V
Collector-emitter breakdown	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	-32			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-100\text{uA}, I_C=0$	-6			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$			-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$			-0.1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE}=-2\text{V}, I_C=-0.5\text{A}$	100		300	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-0.5\text{A}, I_B=-50\text{mA}$			-0.35	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-0.5\text{A}, I_B=-50\text{mA}$			-1.5	V
Base-emitter voltage	$V_{BE(on)}$	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$			-1.1	V
<b>N-MOSFET</b>						
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 16\text{V}, V_{GS} = 0\text{V}$			100	nA
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 5\text{V}, V_{DS} = 0\text{V}$			$\pm 1$	$\mu\text{A}$
Gate threshold voltage (note 3)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.44		1.1	V
Drain-source on-resistance(note 3)	$R_{DS(on)}$	$V_{GS} = 4.5\text{V}, I_D = 0.55\text{A}$			600	$\text{m}\Omega$
		$V_{GS} = 2.5\text{V}, I_D = 0.5\text{A}$			650	$\text{m}\Omega$
		$V_{GS} = 1.8\text{V}, I_D = 0.35\text{A}$			700	$\text{m}\Omega$
Diode forward voltage (note 3)	$V_{SD}$	$I_S = 0.35\text{A}, V_{GS} = 0\text{V}$	0.5		1.1	V
<b>DYNAMIC PARAMETERS (note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 100\text{KHz}$		61		pF
Output Capacitance	$C_{oss}$			17		pF
Reverse Transfer Capacitance	$C_{rss}$			10		pF
<b>SWITCHING PARAMETERS (note 4)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GEN} = 4.5\text{V}, V_{DD} = 10\text{V}, I_D = 500\text{mA}, R_{GEN} = 6\Omega, R_L = 10\Omega$		33		ns
Turn-on rise time	$t_r$			102		ns
Turn-off delay time	$t_{d(off)}$			790		ns
Turn-off fall time	$t_f$			439		ns
Total Gate Charge	$Q_g$	$V_{DS} = 10\text{V}, V_{GS} = 4.5\text{V}, I_D = 0.6\text{A}$		1.15		nC
Gate-Source Charge	$Q_{gs}$			0.15		nC
Gate-Drain Charge	$Q_{gd}$			0.23		nC

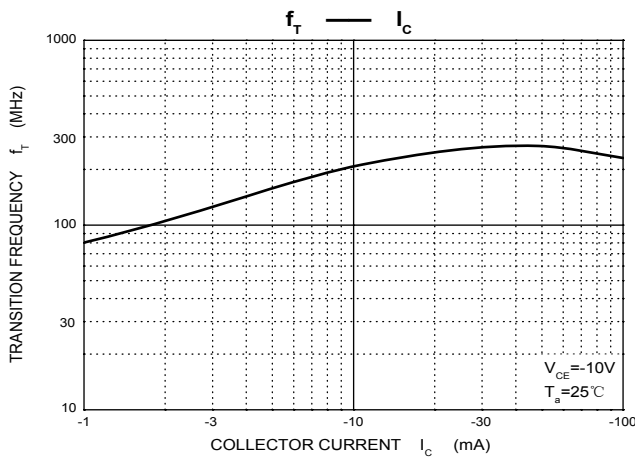
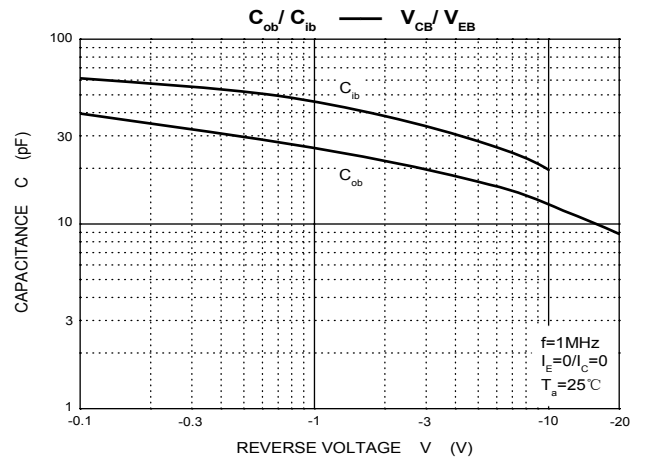
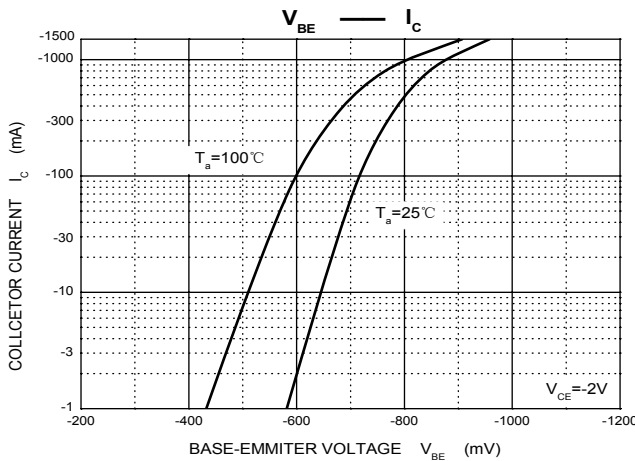
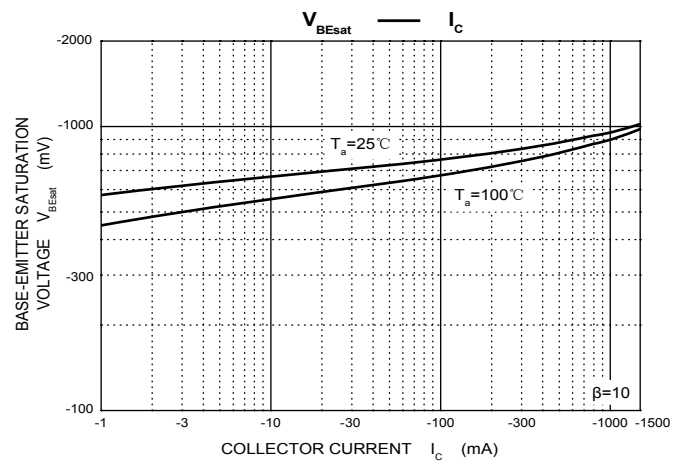
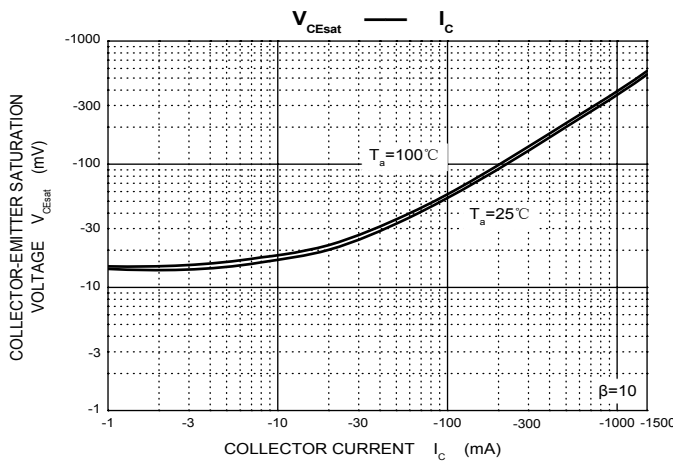
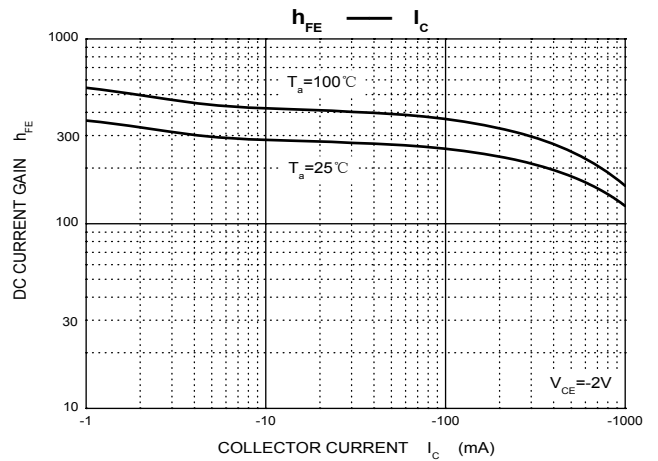
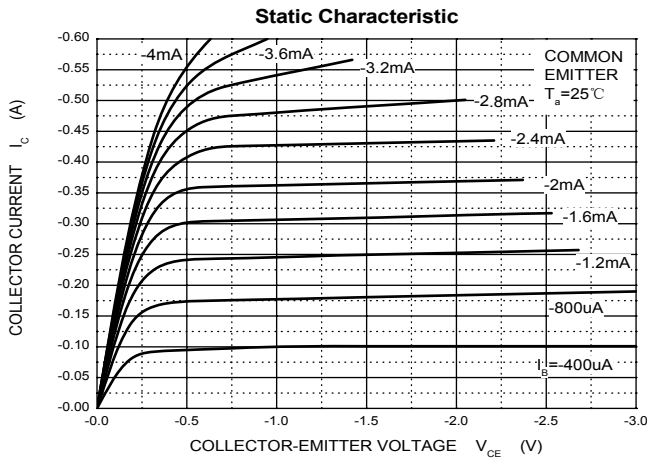
**Notes :**

- 1.Surface mounted on FR4 board using 1 square inch pad size,1oz copper.
- 2.Surface mounted on FR4 board using the minimum pad size,1oz copper.
3. Pulse test : Pulse width=300 $\mu\text{s}$ , duty cycle $\leq 2\%$ .
4. These parameters have no way to verify.

# KYMNT33

PNP Transistor

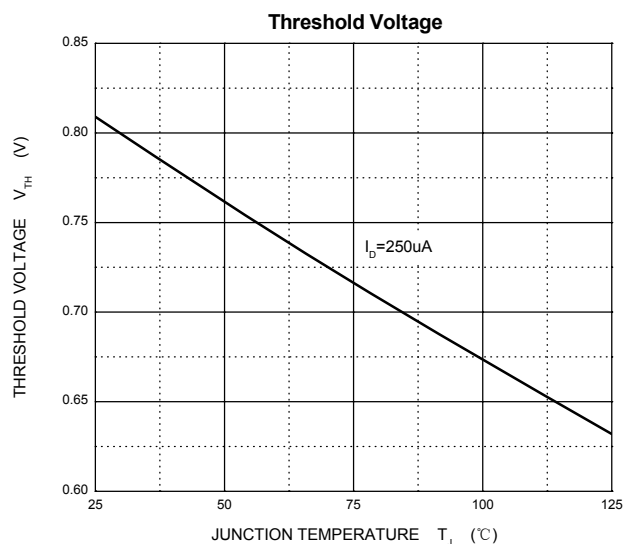
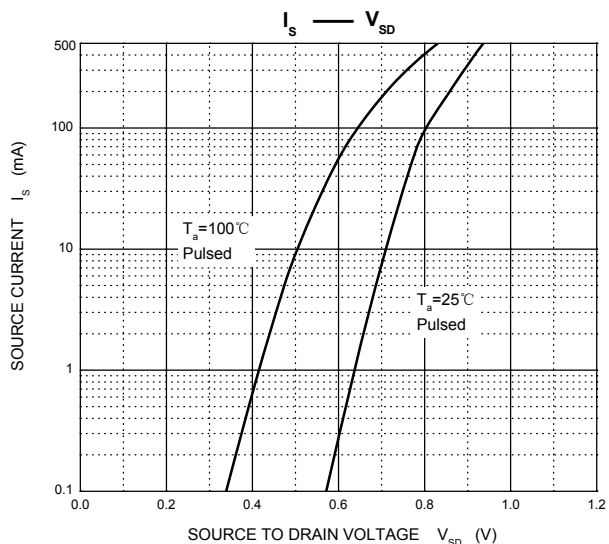
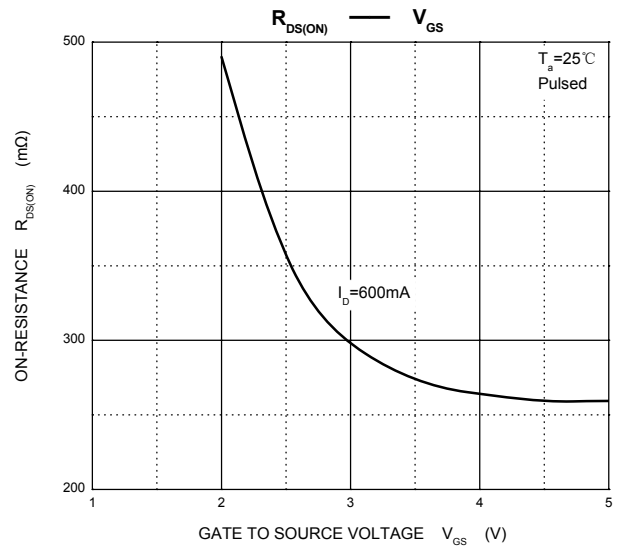
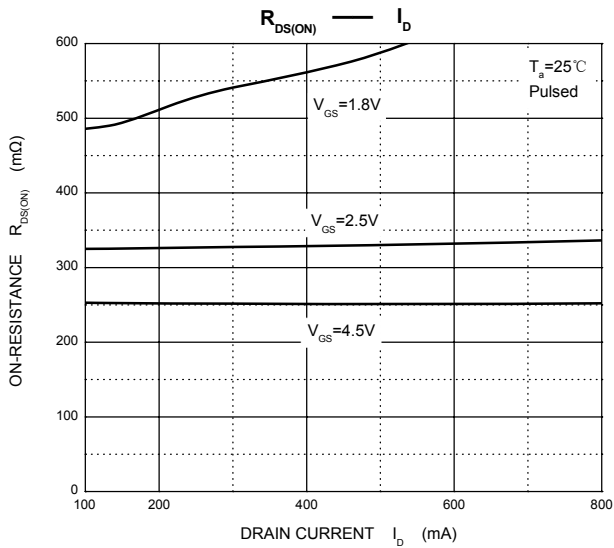
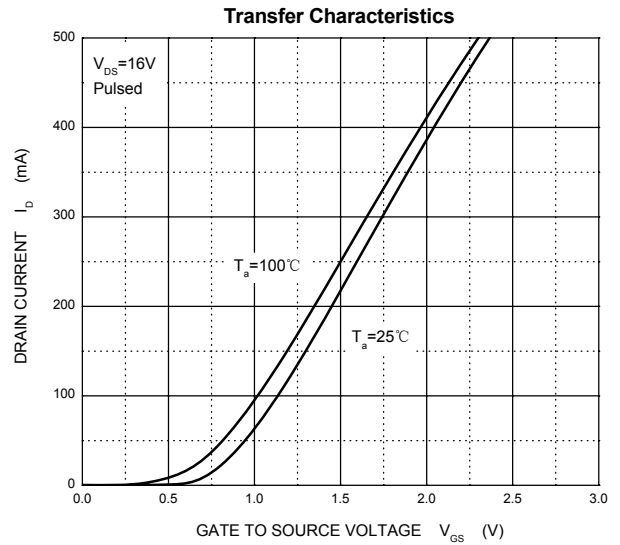
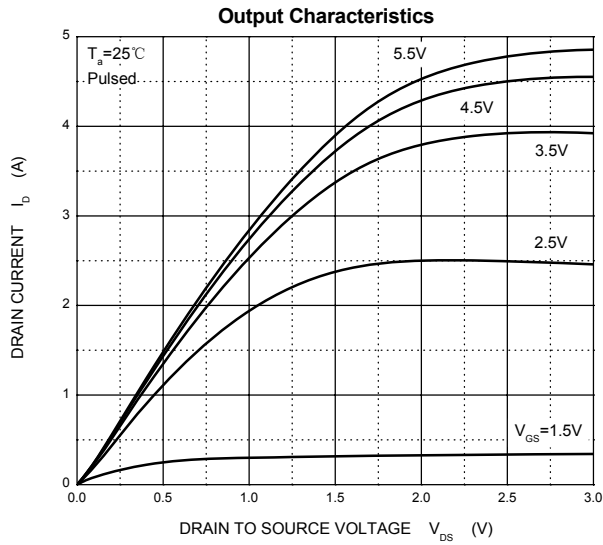
## Typical Characteristics



# KYMNT33

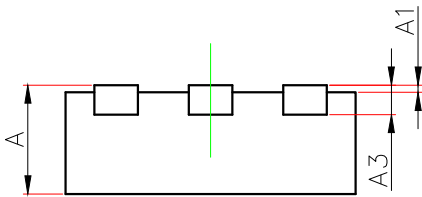
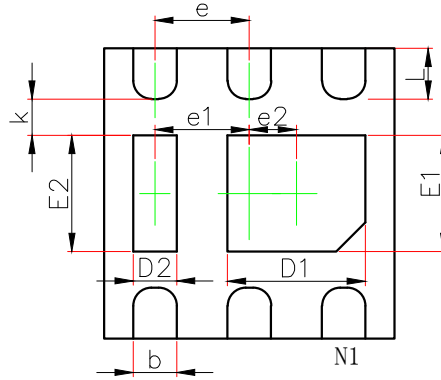
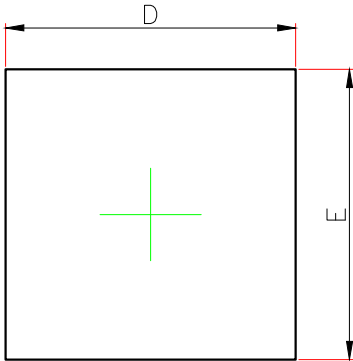
N-channel Characteristics

## Typical Characteristics



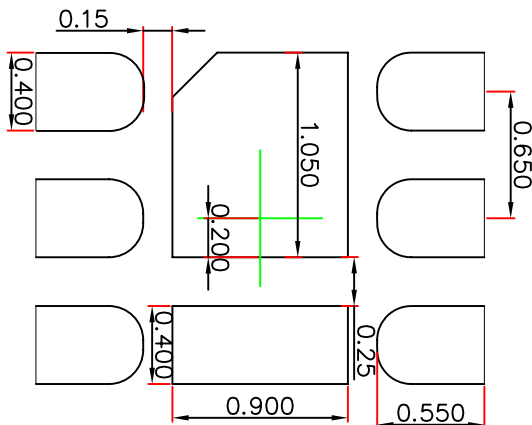
# KYMNT33

## DFNWB2x2-6L- I Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.032
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.850	1.050	0.033	0.041
E1	0.700	0.900	0.028	0.035
D2	0.200	0.400	0.008	0.016
E2	0.700	0.900	0.028	0.035
e1	0.650TYP.		0.026TYP.	
e2	0.325TYP		0.013TYP	
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.300	0.400	0.012	0.016

## DFNWB2x2-6L- I Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050$ mm.
3. The pad layout is for reference purposes only.

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