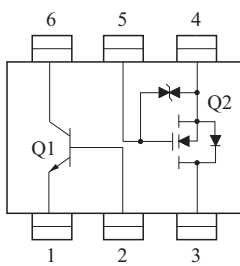


### POWER MANAGEMENT.

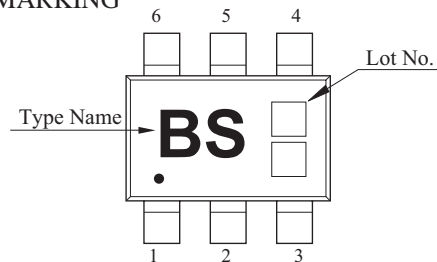
### FEATURES

- Including two devices in US6.
- (Ultra Super mini type with 6 leads)
- Simplify circuit design.
- Reduce a quantity of parts and manufacturing process.

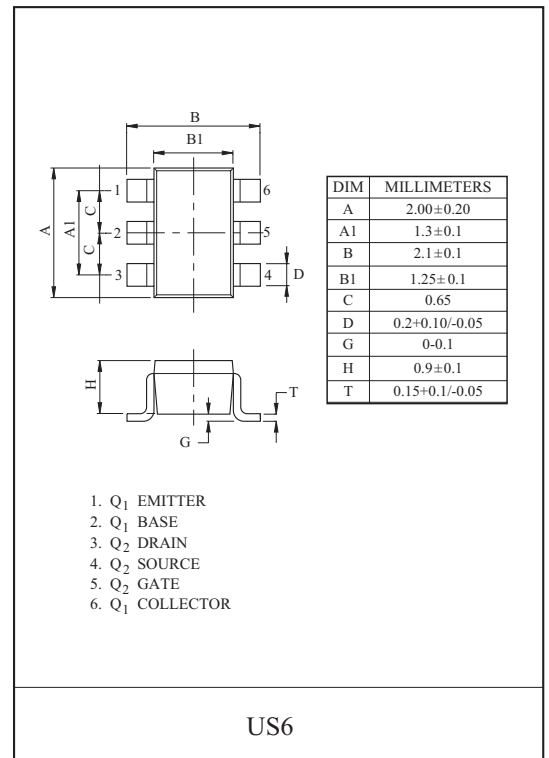
### EQUIVALENT CIRCUIT (TOP VIEW)



### MARKING



THIS TRANSISTOR IS ELECTROSTATIC SENSITIVE DEVICE.  
PLEASE HANDLE WITH CAUTION.



### Q<sub>1</sub> MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V <sub>CB0</sub>	15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	12	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	500	mA
	I <sub>CP</sub> *	1	A
Collector Power Dissipation	P <sub>C</sub> *	150	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-55 ~ 150	°C

\* Single Pulse PW=1mS.

\*\* 120mW per element must not be exceeded. Each terminal mounted on a recommended land.

### Q<sub>2</sub> MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
DC Drain Current	I <sub>D</sub>	100	mA
Drain Power Dissipation	P <sub>C</sub> **	150	mW
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-55 ~ 150	°C

\*\* 120mW per element must not be exceeded. Each terminal mounted on a recommended land.

# KTX421U

## Q<sub>1</sub> ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> =15V, I <sub>E</sub> =0	-	-	100	nA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> =6V, I <sub>C</sub> =0	-	-	100	nA
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA	15	-	-	V
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA	12	-	-	V
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA	6	-	-	V
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =10mA	270	-	680	-
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =200mA, I <sub>B</sub> =10mA	-	90	250	mV
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =10mA, f <sub>T</sub> =100MHz	-	320	-	MHz
Collector Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz	-	7.5	-	pF

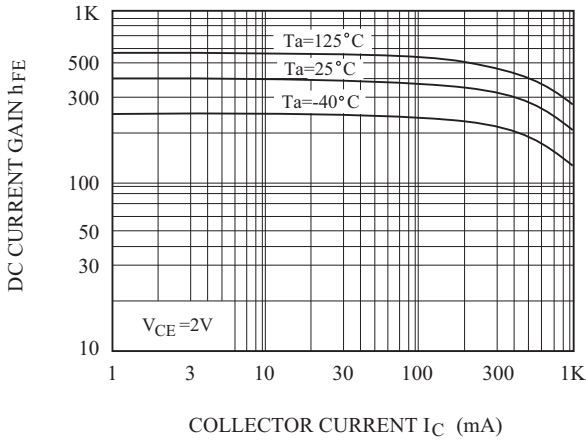
## Q<sub>2</sub> ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	-	-	±1	μA	
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =100μA, V <sub>GS</sub> =0V	30	-	-	V	
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	1	μA	
Gate Threshold Voltage	V <sub>th</sub>	V <sub>DS</sub> =3V, I <sub>D</sub> =0.1mA	0.5	-	1.5	V	
Forward Transfer Admittance	Y <sub>fs</sub>	V <sub>DS</sub> =3V, I <sub>D</sub> =10mA	25	-	-	mS	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	I <sub>D</sub> =10mA, V <sub>GS</sub> =2.5V	-	4	7	Ω	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =3V, V <sub>GS</sub> =0V, f=1MHz	-	8.5	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =3V, V <sub>GS</sub> =0V, f=1MHz	-	3.3	-	pF	
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =3V, V <sub>GS</sub> =0V, f=1MHz	-	9.3	-	pF	
Switching Time	Turn-on Time	t <sub>on</sub>	V <sub>DD</sub> =5V, I <sub>D</sub> =10mA, V <sub>GS</sub> =0~5V	-	50	-	nS
	Turn-off Time	t <sub>off</sub>		-	160	-	nS

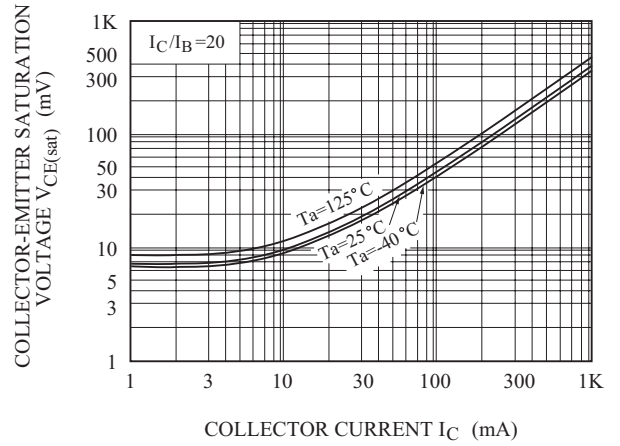
# KTX421U

Q<sub>1</sub> (NPN TRANSISTOR)

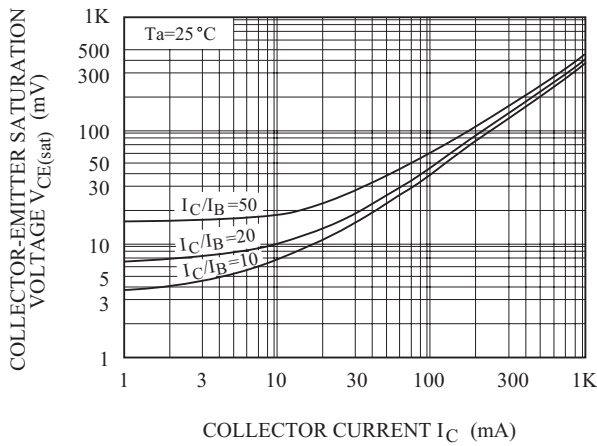
$h_{FE} - I_C$



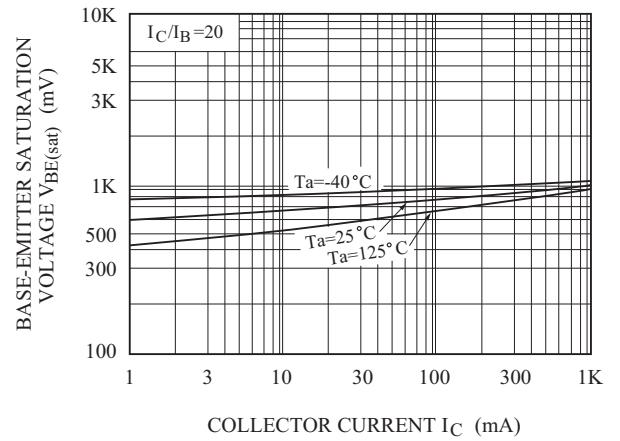
$V_{CE(sat)} - I_C$



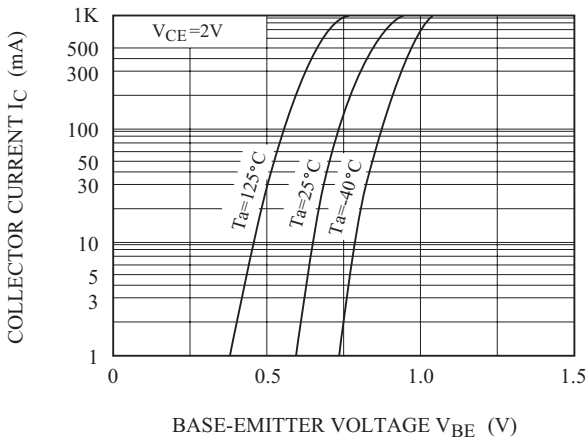
$V_{CE(sat)} - I_C$



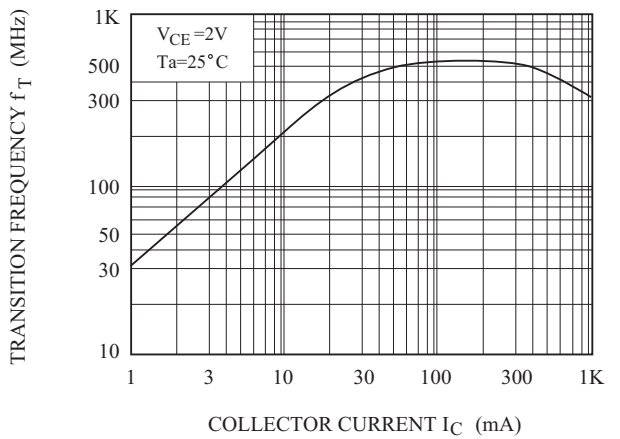
$V_{BE(sat)} - I_C$



$I_C - V_{BE}$

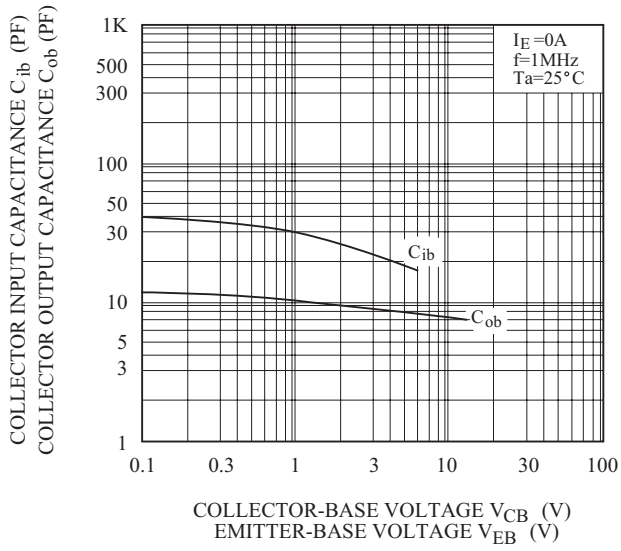


$f_T - I_C$

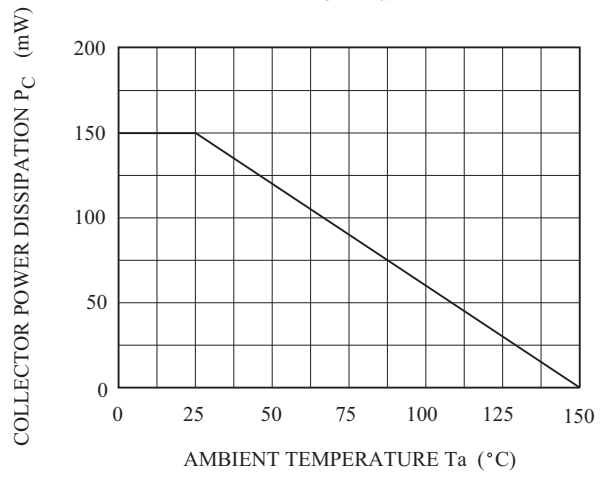


# KTX421U

$C_{ob} - V_{CB}$ ,  $C_{ib} - V_{EB}$



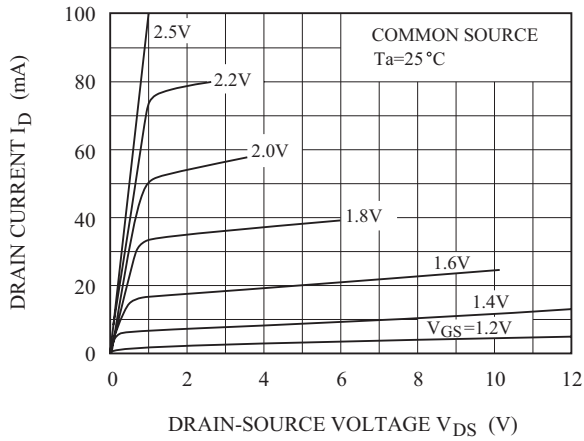
$P_c - T_a$



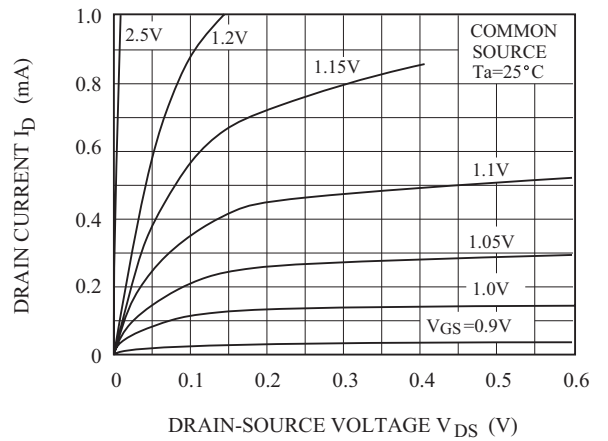
# KTX421U

Q<sub>2</sub> (N CHANNEL MOS FIELD EFFECT TRANSISTOR)

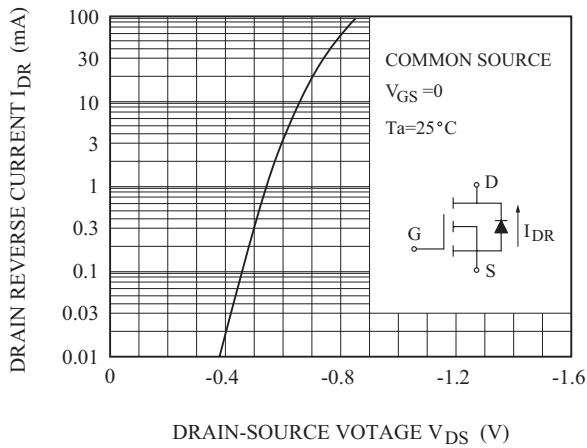
$I_D - V_{DS}$



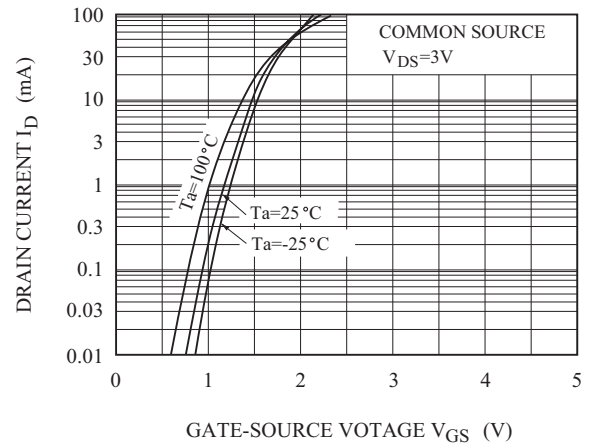
$I_D - V_{DS}$   
(LOW VOLTAGE REGION)



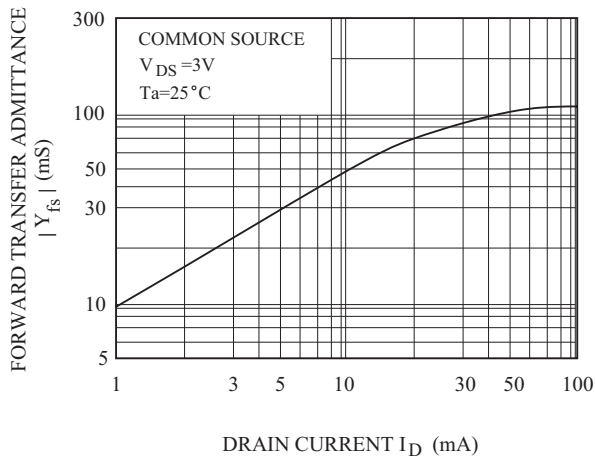
$I_{DR} - V_{DS}$



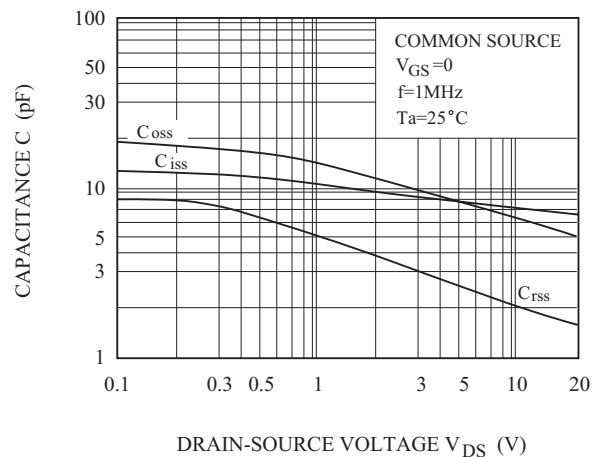
$I_D - V_{GS}$



$|Y_{fs}| - I_D$

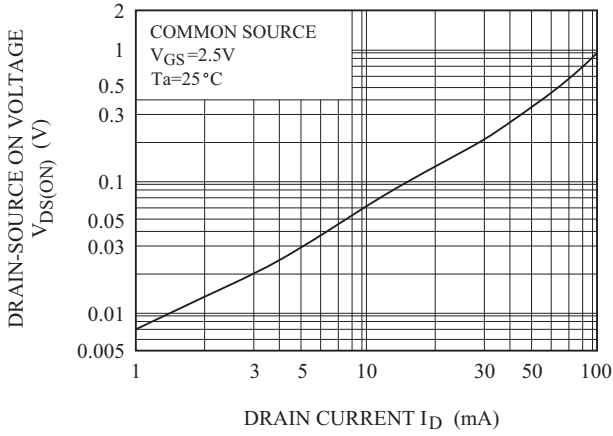


$C - V_{DS}$

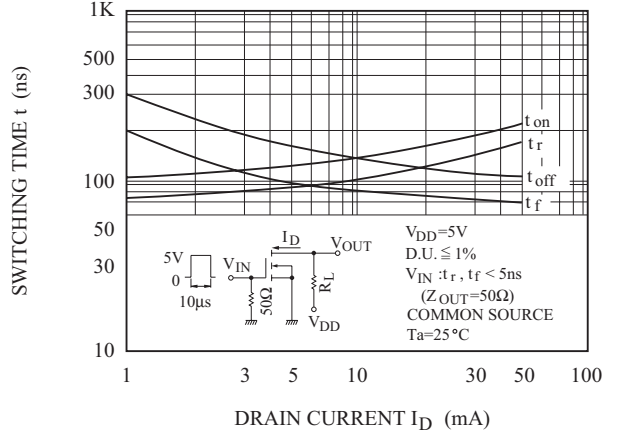


# KTX421U

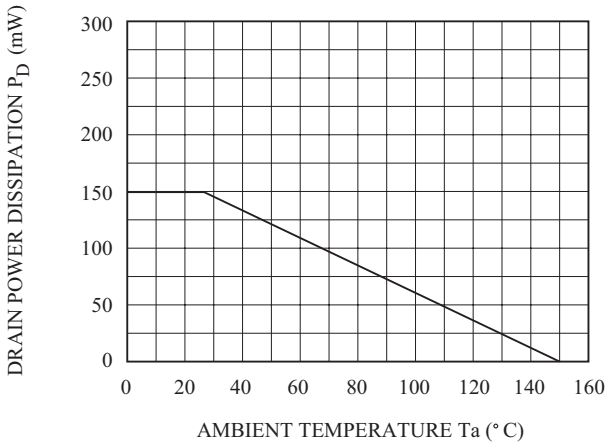
$V_{DS(ON)} - I_D$



$t - I_D$



$P_D - T_a$



## SWITCHING TIME TEST CIRCUIT

