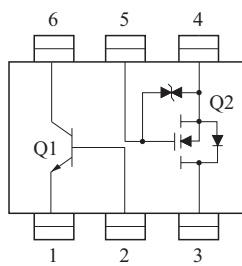


POWER MANAGEMENT.

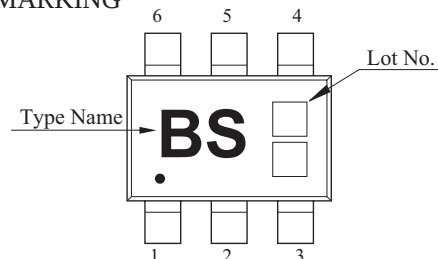
FEATURES

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

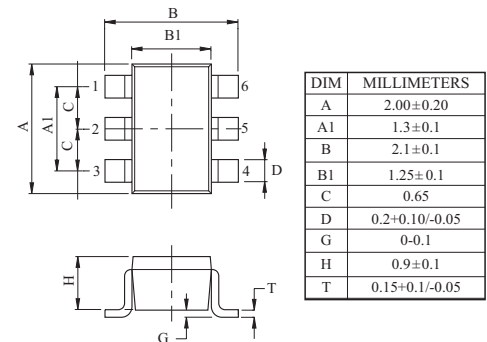
EQUIVALENT CIRCUIT (TOP VIEW)



MARKING



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



1. Q₁ EMITTER
2. Q₁ BASE
3. Q₂ DRAIN
4. Q₂ SOURCE
5. Q₂ GATE
6. Q₁ COLLECTOR

US6

Q₁ MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	15	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	500	mA
	I_{CP}^*	1	A
Collector Power Dissipation	P_C^*	150	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

* Single Pulse PW=1mS.

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

Q₂ MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
DC Drain Current	I_D	100	mA
Drain Power Dissipation	P_C^{**}	150	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

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

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Q₁ ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB}=15V, I_E=0$	-	-	100	nA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=6V, I_C=0$	-	-	100	nA
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A$	15	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA$	12	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A$	6	-	-	V
DC Current Gain	h_{FE}	$V_{CE}=2V, I_C=10mA$	270	-	680	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=200mA, I_B=10mA$	-	90	250	mV
Transition Frequency	f_T	$V_{CE}=2V, I_C=10mA, f_T=100MHz$	-	320	-	MHz
Collector Output Capacitance	C_{ob}	$V_{CB}=10V, I_E=0, f=1MHz$	-	7.5	-	pF

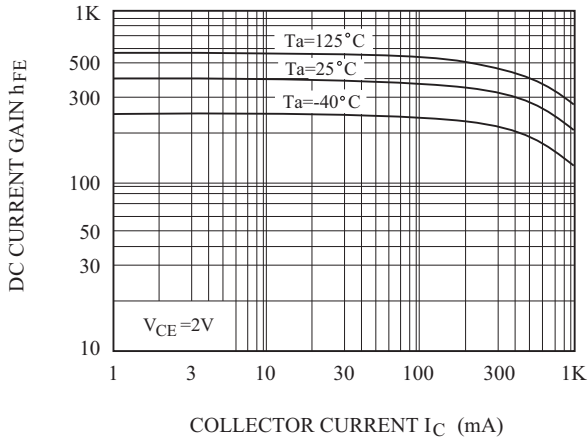
Q₂ ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 1	μA
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=100\mu A, V_{GS}=0V$	30	-	-	V
Drain Cut-off Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate Threshold Voltage	V_{th}	$V_{DS}=3V, I_D=0.1mA$	0.5	-	1.5	V
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS}=3V, I_D=10mA$	25	-	-	mS
Drain-Source ON Resistance	$R_{DS(ON)}$	$I_D=10mA, V_{GS}=2.5V$	-	4	7	Ω
Input Capacitance	C_{iss}	$V_{DS}=3V, V_{GS}=0V, f=1MHz$	-	8.5	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=3V, V_{GS}=0V, f=1MHz$	-	3.3	-	pF
Output Capacitance	C_{oss}	$V_{DS}=3V, V_{GS}=0V, f=1MHz$	-	9.3	-	pF
Switching Time	Turn-on Time	$V_{DD}=5V, I_D=10mA, V_{GS}=0 \sim 5V$	-	50	-	nS
	Turn-off Time		-	160	-	nS

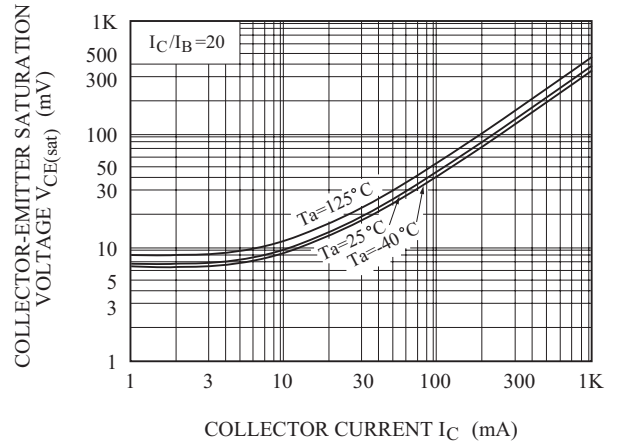
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Q₁ (NPN TRANSISTOR)

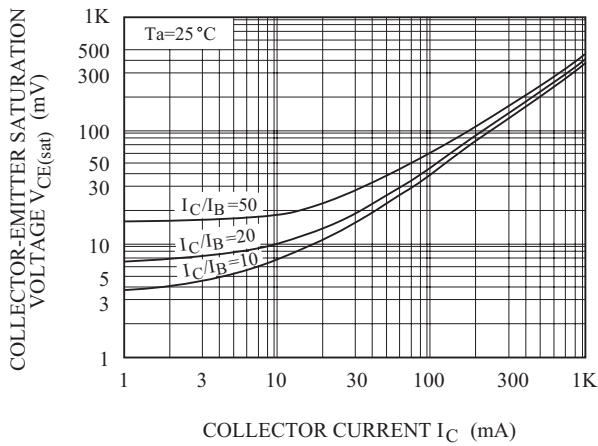
$h_{FE} - I_C$



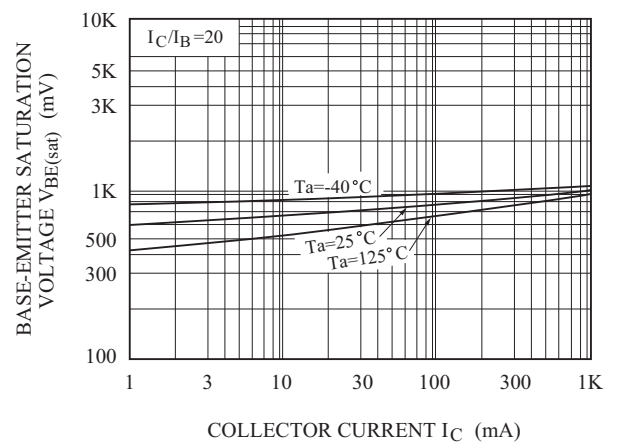
$V_{CE(sat)} - I_C$



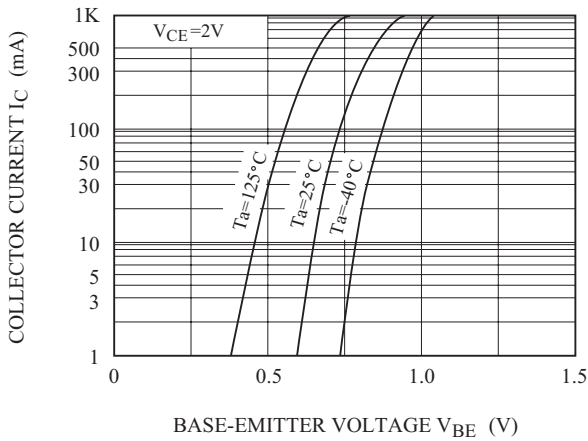
$V_{CE(sat)} - I_C$



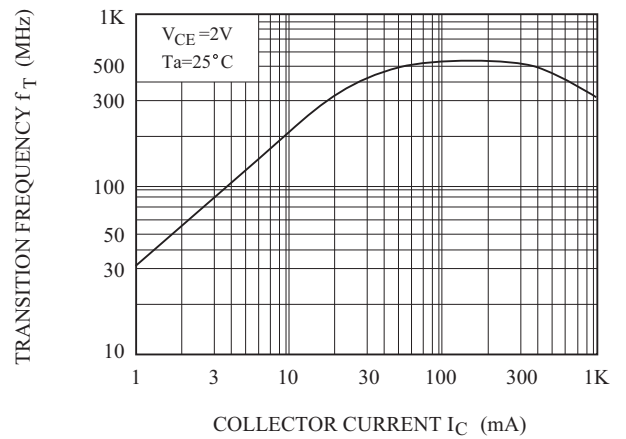
$V_{BE(sat)} - I_C$



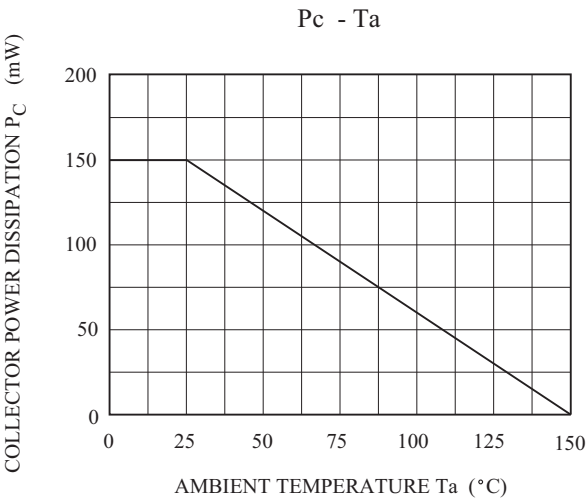
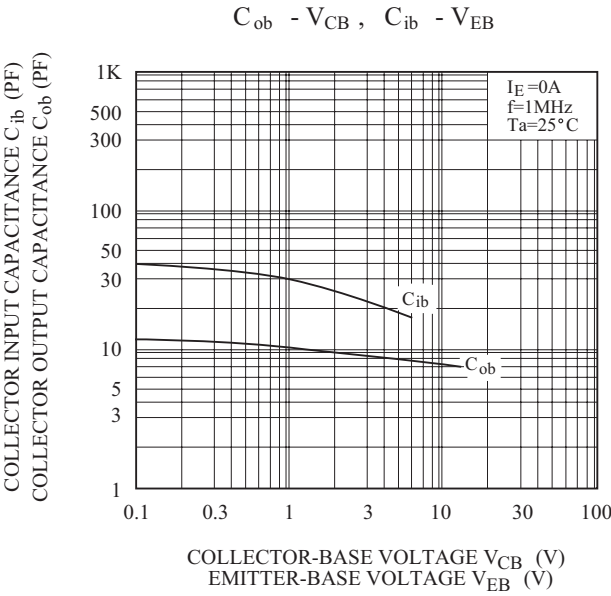
$I_C - V_{BE}$



$f_T - I_C$



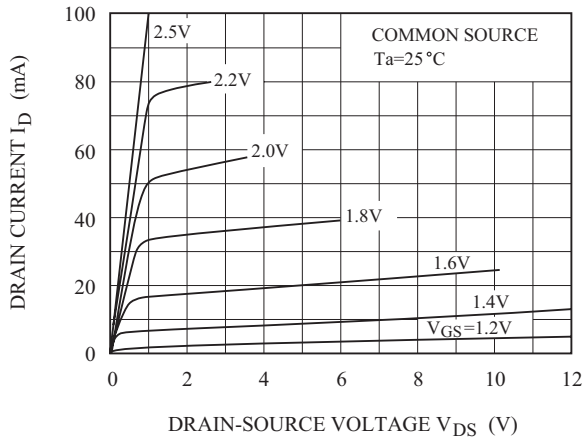
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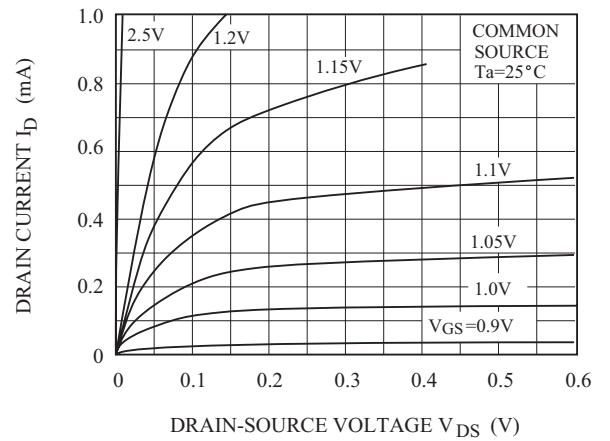
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Q₂ (N CHANNEL MOS FIELD EFFECT TRANSISTOR)

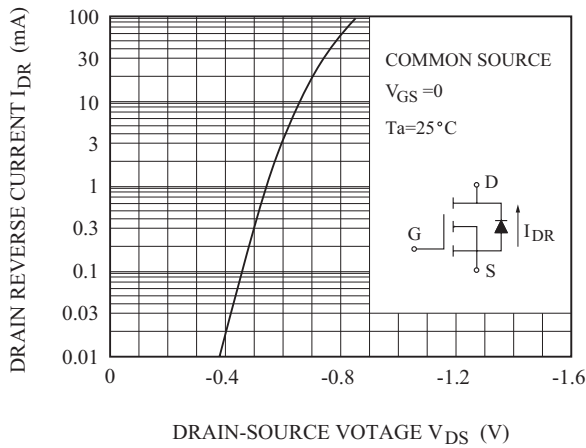
$I_D - V_{DS}$



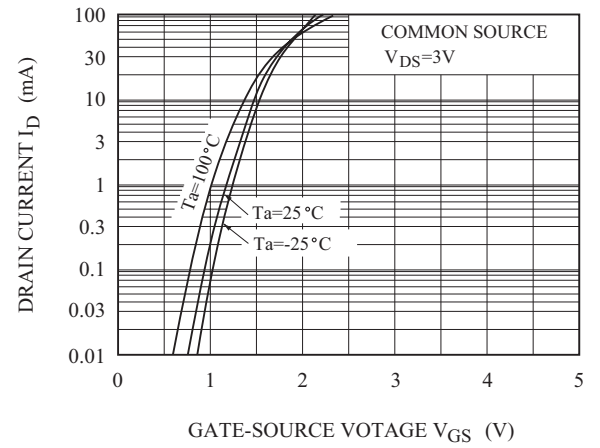
$I_D - V_{DS}$
(LOW VOLTAGE REGION)



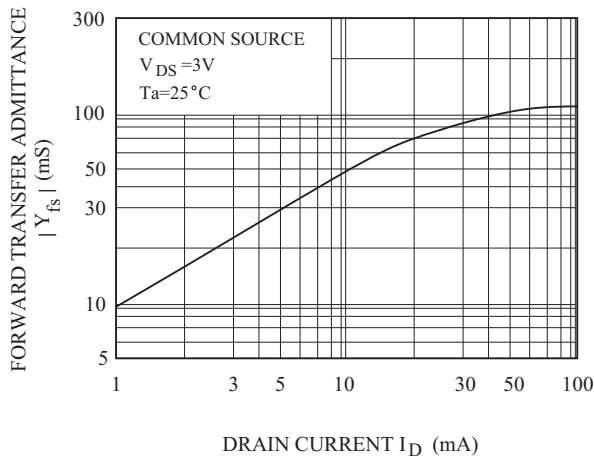
$I_{DR} - V_{DS}$



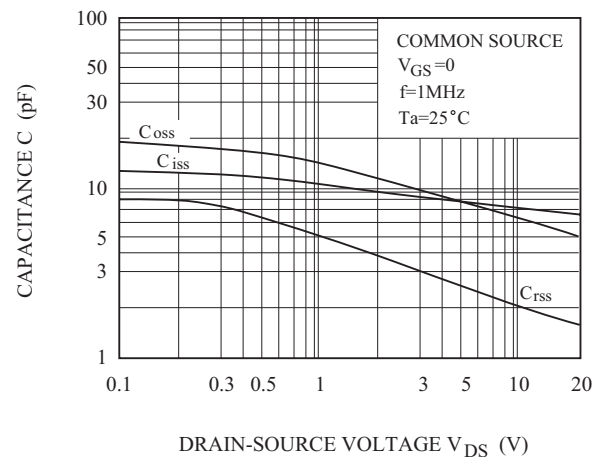
$I_D - V_{GS}$



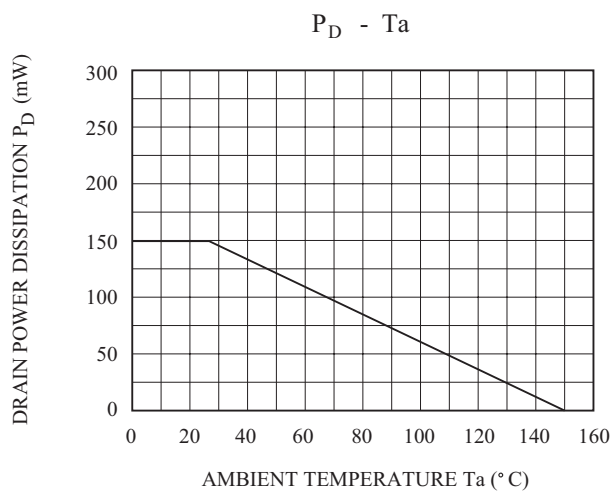
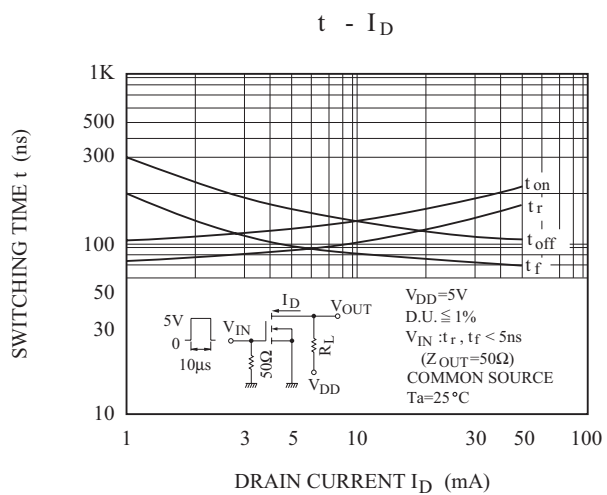
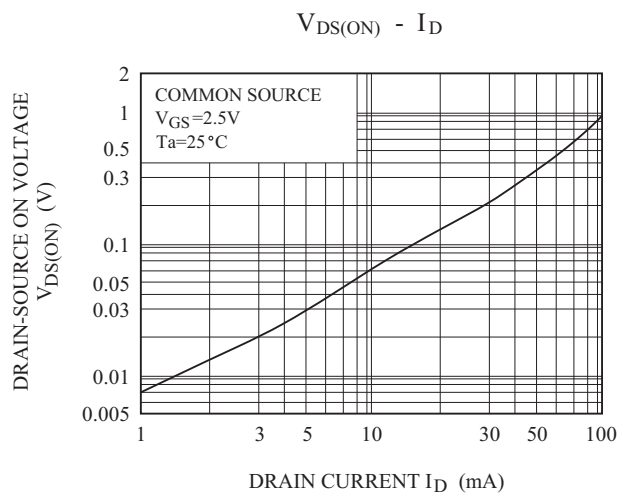
$|Y_{fs}| - I_D$



$C - V_{DS}$



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SWITCHING TIME TEST CIRCUIT

