

TOSHIBA

HN1L03FU

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N-P CHANNEL MOS TYPE

HN1L03FU

HIGH SPEED SWITCHING APPLICATIONS

Unit in mm

ANAROG SWITCH APPLICATIONS

Q1, Q2 COMMON

- Low Threshold Voltage
Q1 : $V_{th} = 0.8 \sim 2.5 V$ Q2 : $V_{th} = -0.5 \sim -1.5 V$
- High Speed
- Small Package

Q1 MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GSS}	10	V
Drain Current	I_D	50	mA

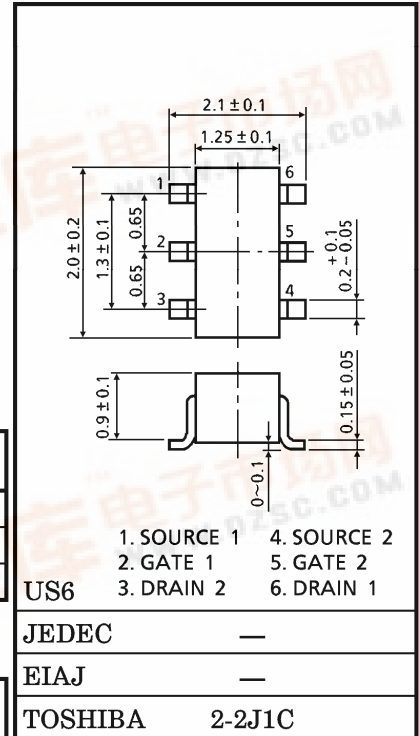
Q2 MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GSS}	-7	V
Drain Current	I_D	-50	mA

MAXIMUM RATINGS (Q1, Q2 COMMON) (Ta = 25°C)

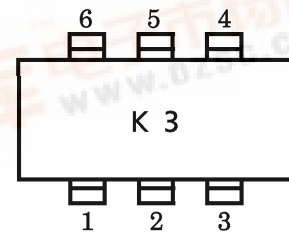
CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain Power Dissipation	P_D^*	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

* : Total Rating

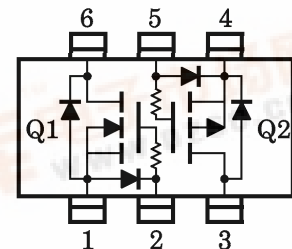


Weight : 6.8 mg

MARKING

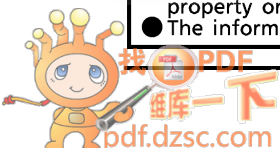


EQUIVALENT CIRCUIT (TOP VIEW)



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Q1 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

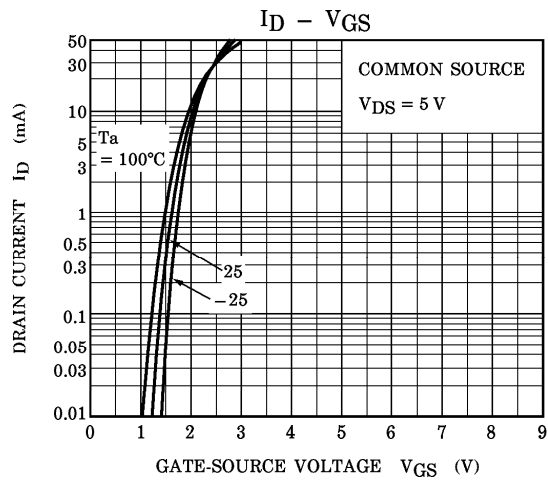
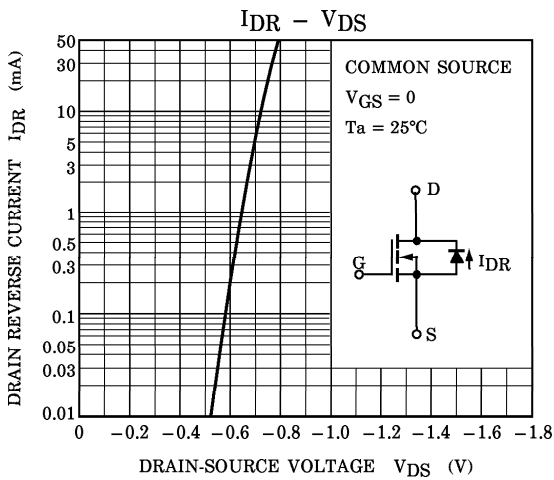
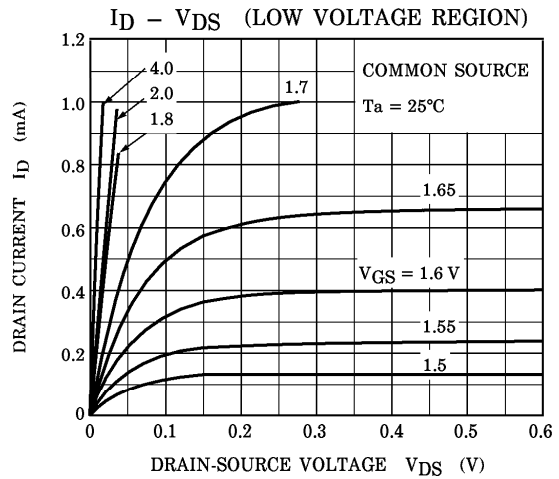
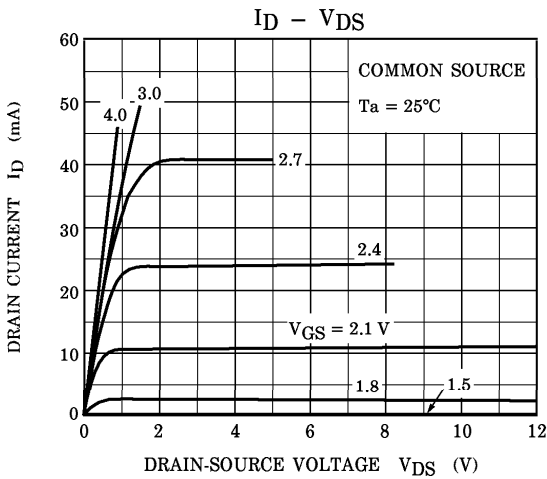
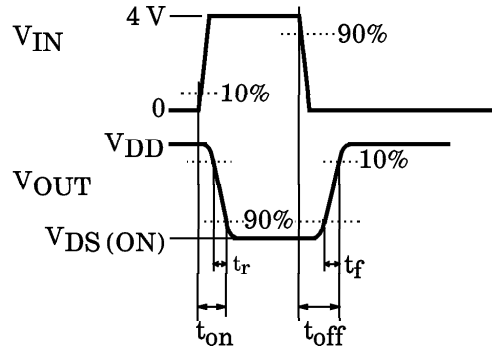
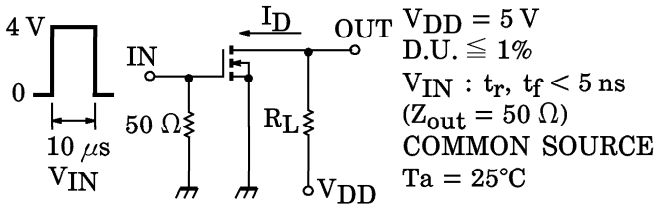
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	1	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 100\ \mu\text{A}, V_{GS} = 0$	50	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS} = 50\text{ V}, V_{GS} = 0$	—	—	1	μA
Gate Threshold Voltage		V_{th}	$V_{DS} = 5\text{ V}, I_D = 0.1\text{ mA}$	0.8	—	2.5	V
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}$	20	—	—	mS
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 4.0\text{ V}$	—	20	50	Ω
Input Capacitance		C_{iss}	$V_{DS} = 5\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	6.3	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS} = 5\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	1.3	—	pF
Output Capacitance		C_{oss}	$V_{DS} = 5\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	5.7	—	pF
Switching Time	Turn-on Time	t_{on}	$V_{DD} = 5\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 4.0\text{ V}$	—	0.11	—	μs
	Turn-off Time	t_{off}	$V_{DD} = 5\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 4.0\text{ V}$	—	0.15	—	μs

Q2 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

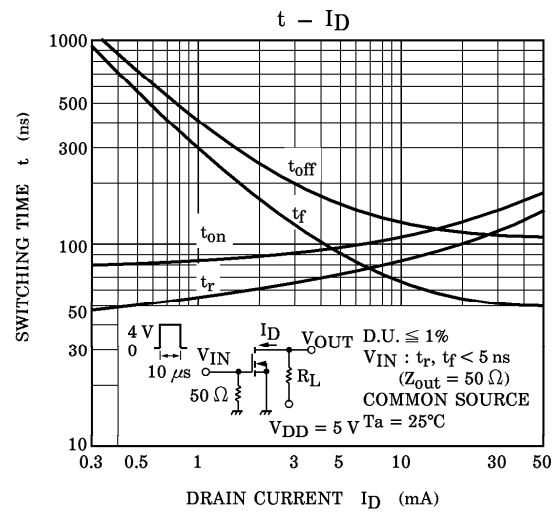
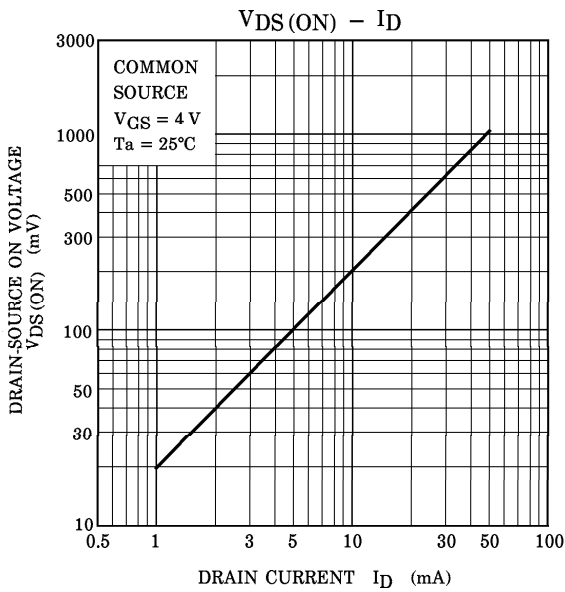
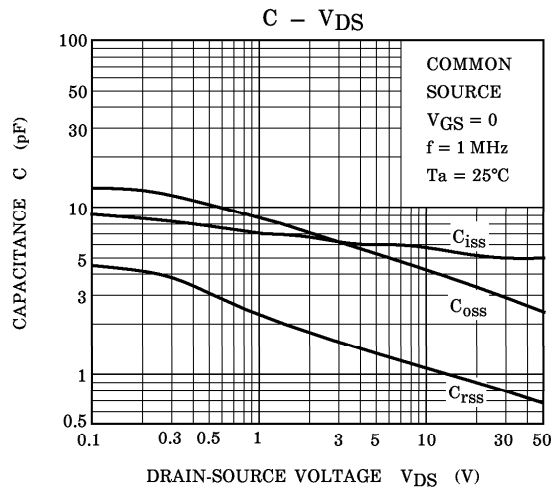
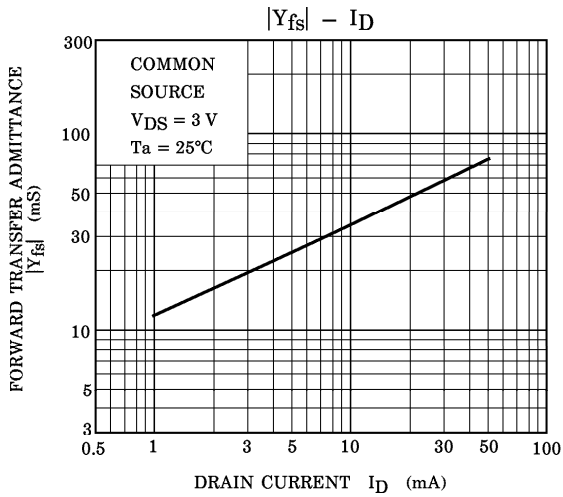
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = -7\text{ V}, V_{DS} = 0$	—	—	-1	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -100\ \mu\text{A}, V_{GS} = 0$	-20	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS} = -20\text{ V}, V_{GS} = 0$	—	—	-1	μA
Gate Threshold Voltage		V_{th}	$V_{DS} = -3\text{ V}, I_D = -0.1\text{ mA}$	-0.5	—	-1.5	V
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -3\text{ V}, I_D = -10\text{ mA}$	15	—	—	mS
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = -10\text{ mA}, V_{GS} = -2.5\text{ V}$	—	20	40	Ω
Input Capacitance		C_{iss}	$V_{DS} = -3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	10.4	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS} = -3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	2.8	—	pF
Output Capacitance		C_{oss}	$V_{DS} = -3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	8.4	—	pF
Switching Time	Turn-on Time	t_{on}	$V_{DD} = -3\text{ V}, I_D = -10\text{ mA}, V_{GS} = 0\sim -2.5\text{ V}$	—	0.15	—	μs
	Turn-off Time	t_{off}	$V_{DD} = -3\text{ V}, I_D = -10\text{ mA}, V_{GS} = 0\sim -2.5\text{ V}$	—	0.13	—	μs

Q1 (Nch MOS FET)

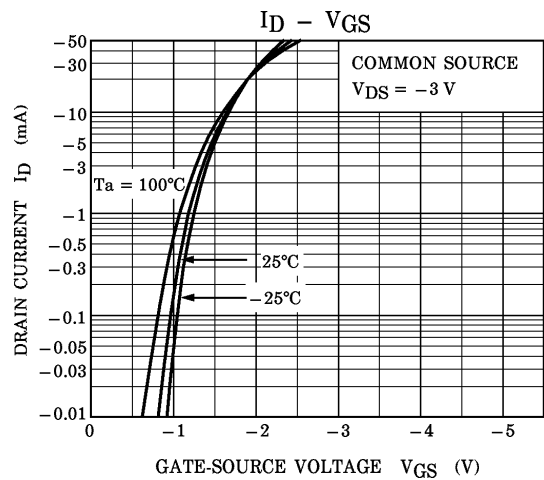
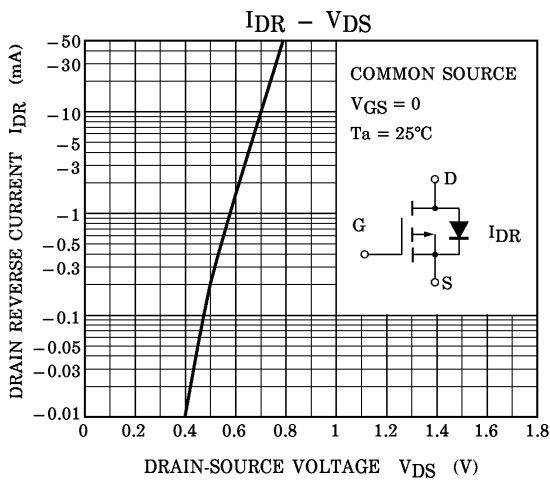
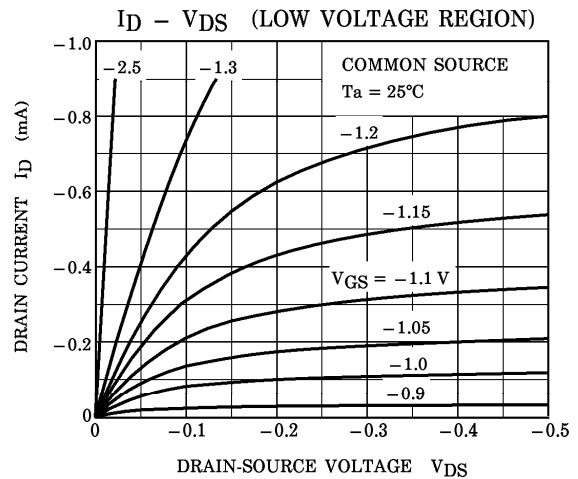
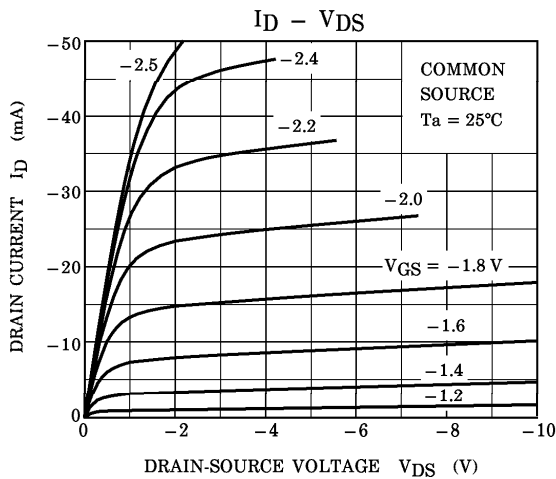
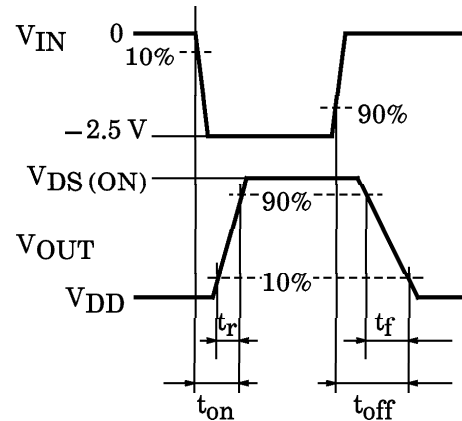
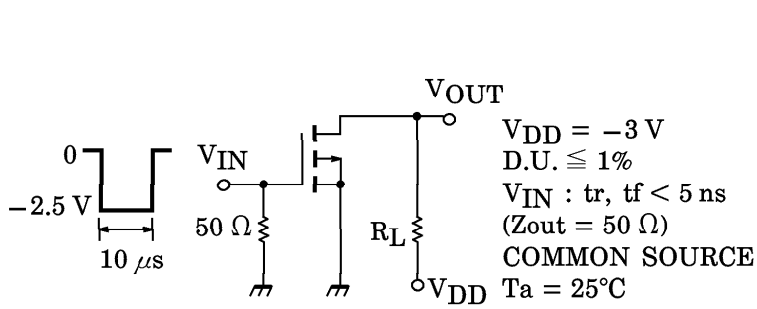
SWITCHING TIME TEST CIRCUIT



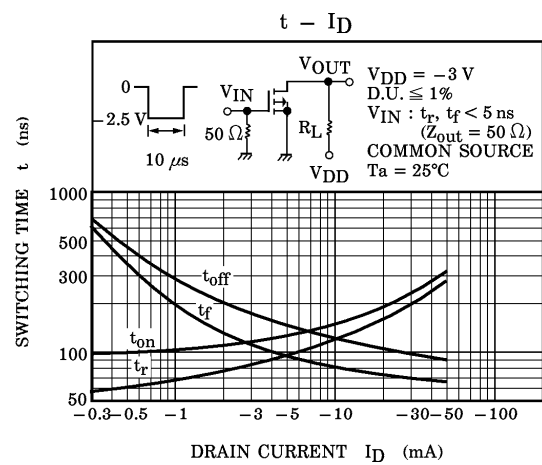
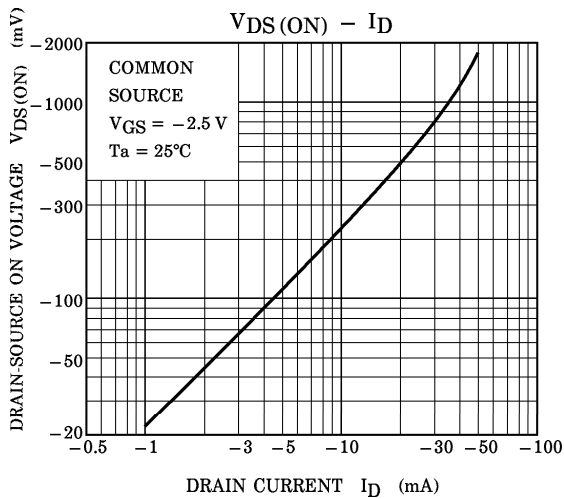
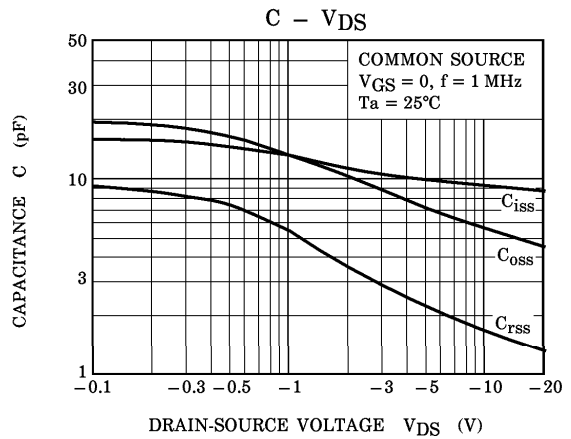
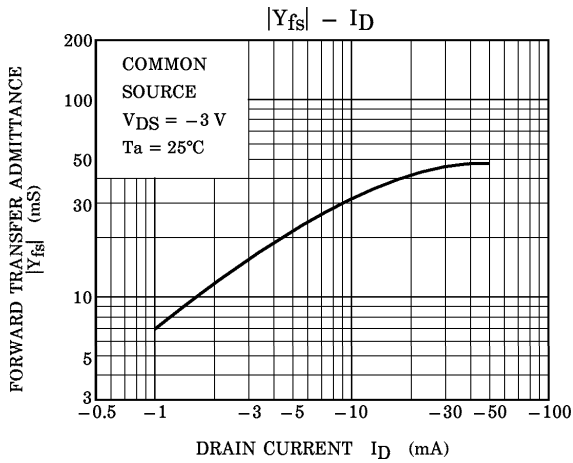
Q1 (Nch MOS FET)



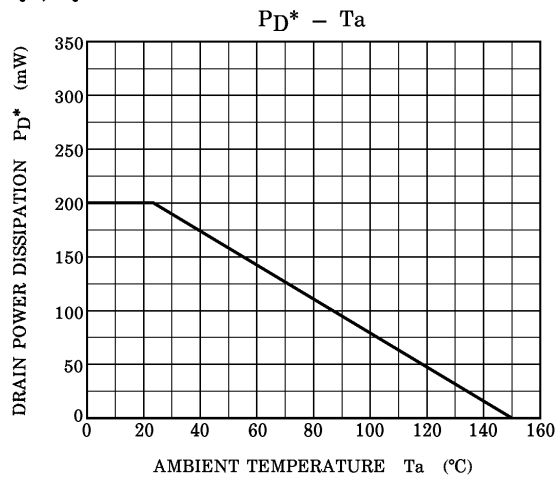
Q2 (Pch MOS FET)
SWITCHING TIME TEST CIRCUIT



Q2 (Pch MOS FET)



(Q1, Q2 COMMON)



* : Total Rating