

TOSHIBA

2SJ407

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (π -MOSV)

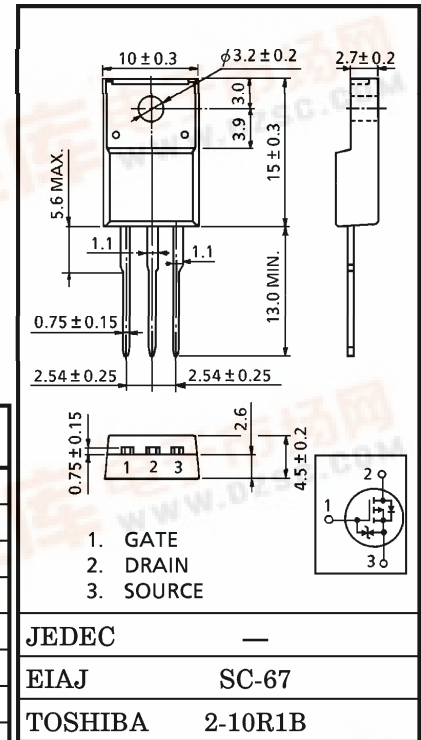
2SJ407

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.8\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\mu A$ (Max.) ($V_{DS} = -200V$)
- Enhancement-Mode : $V_{th} = -1.5 \sim -3.5V$
($V_{DS} = -10V, I_D = -1mA$)



MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-200	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	-200	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	-5	A
	Pulse	I_{DP}	-20	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	30	W
Single Pulse Avalanche Energy**		E_{AS}	195	mJ
Avalanche Current		I_{AR}	-5	A
Repetitive Avalanche Energy*		E_{AR}	3.0	mJ
Chanel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$

Weight : 1.9g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Chanel To Case	$R_{th(ch-c)}$	4.16	$^\circ C/W$
Thermal Resistance, Chanel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

Note ;

* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

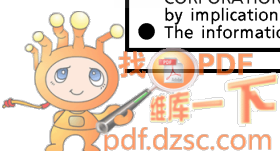
** $V_{DD} = -50V$, Starting $T_{ch} = 25^\circ C$, $L = 12.6mH$, $R_G = 25\Omega$, $I_{AR} = -5A$

This transistor is an electrostatic sensitive device.

Please handle with caution.

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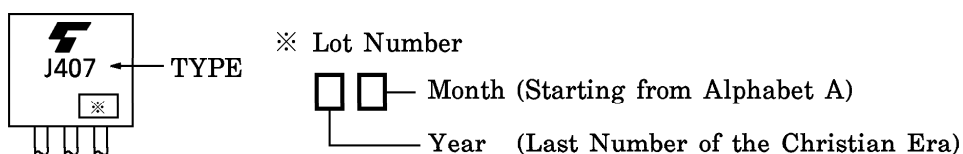
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

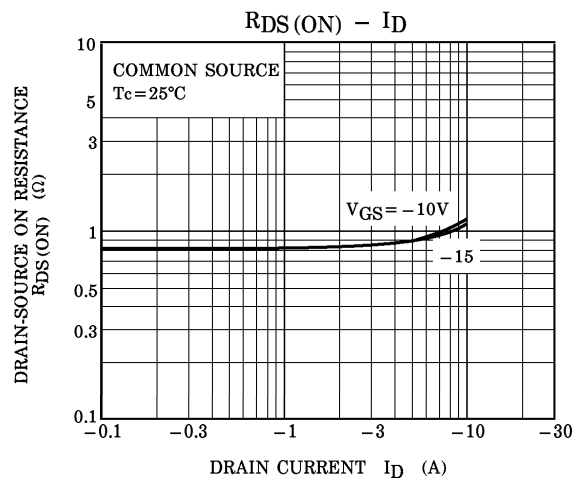
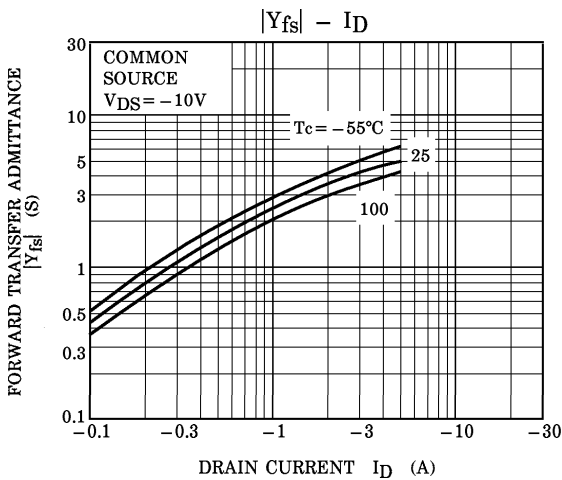
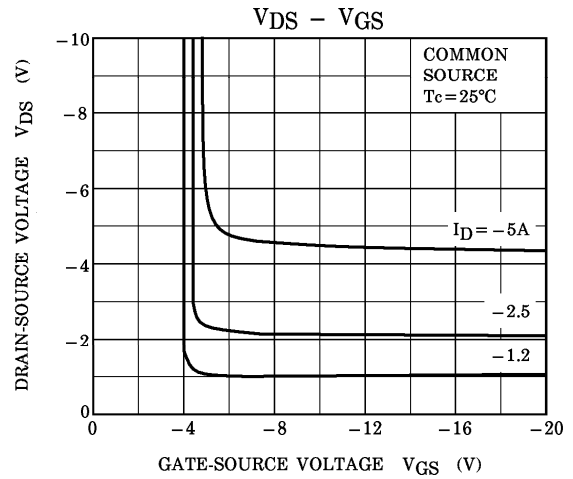
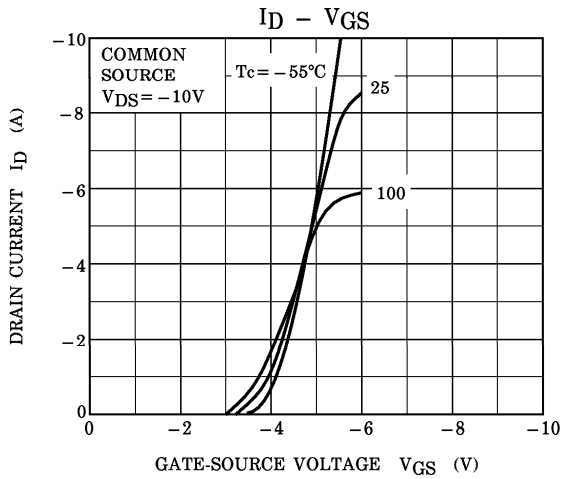
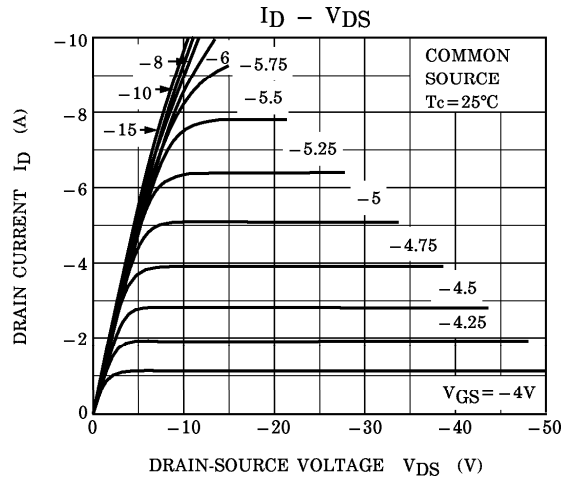
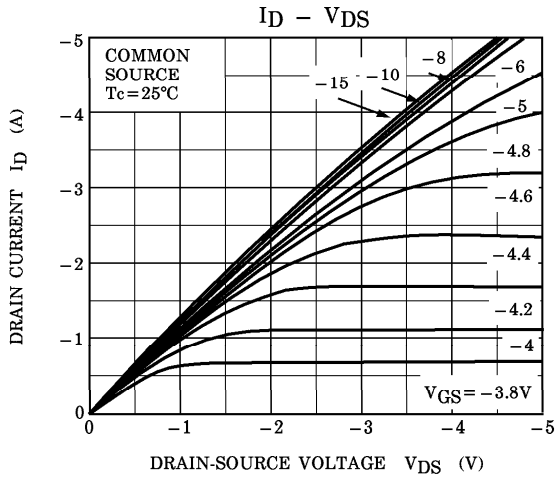
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = -200V, V_{GS} = 0V$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -10mA, V_{GS} = 0V$	-200	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10V, I_D = -1mA$	-1.5	—	-3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -2.5A$	—	0.8	1.0	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10V, I_D = -2.5A$	2.0	4.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1MHz$	—	800	—	pF
Reverse Transfer Capacitance		C_{rss}		—	80	—	
Output Capacitance		C_{oss}		—	270	—	
Switching Time	Rise Time	t_r	<p>$I_D = -2.5A$ $V_{GS} = 0V, -10V$ $R_L = 40\Omega$ $V_{DD} = -100V$ $V_{IN} : t_r, t_f < 5ns$ Duty $\leq 1\%$, $t_w = 10\mu s$</p>	—	15	—	ns
	Turn-on Time	t_{on}		—	30	—	
	Fall Time	t_f		—	6	—	
	Turn-off Time	t_{off}		—	65	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -160V$ $V_{GS} = -10V$ $I_D = -5A$	—	20	—	nC
Gate-Source Charge		Q_{gs}		—	13	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	7	—	

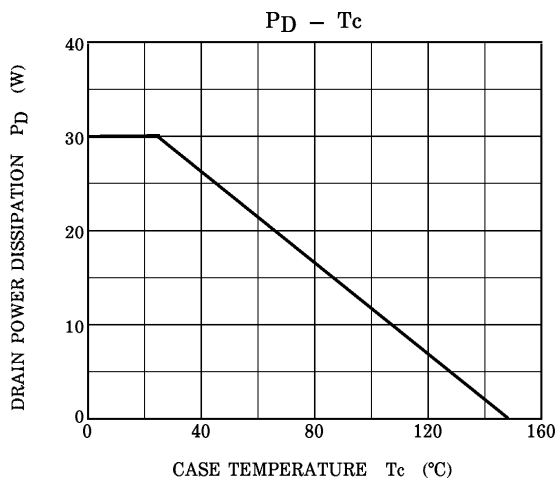
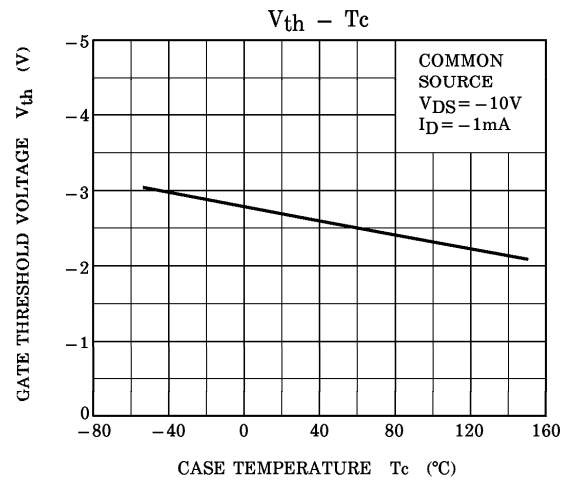
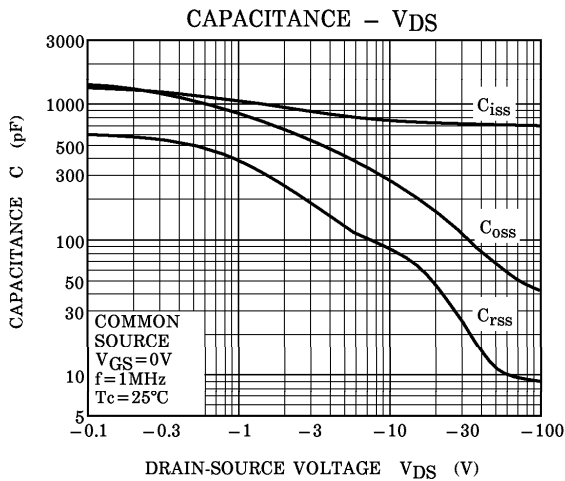
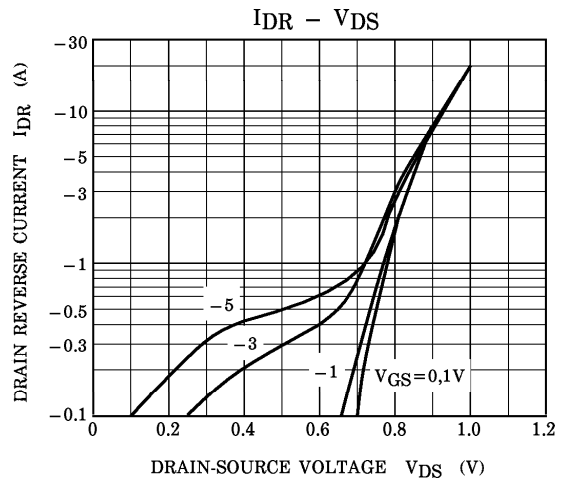
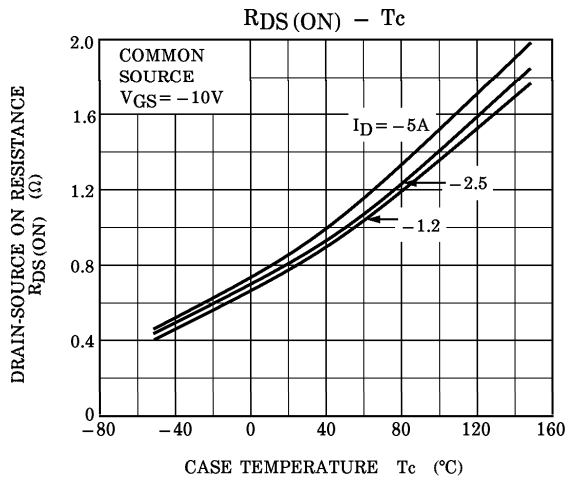
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

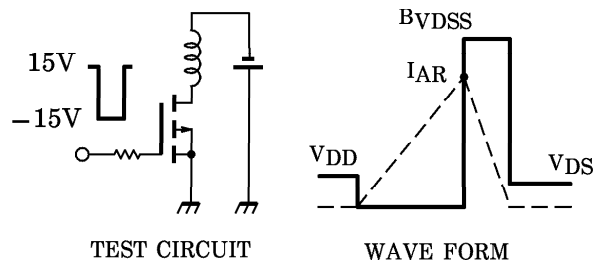
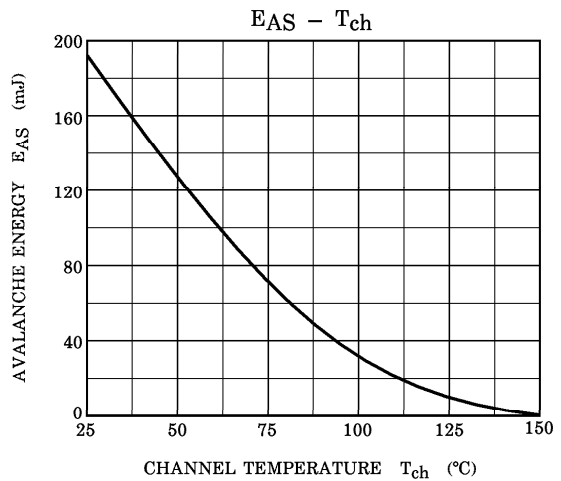
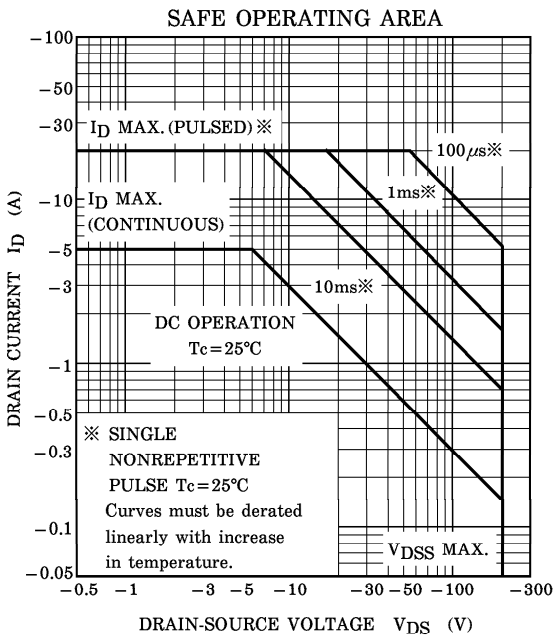
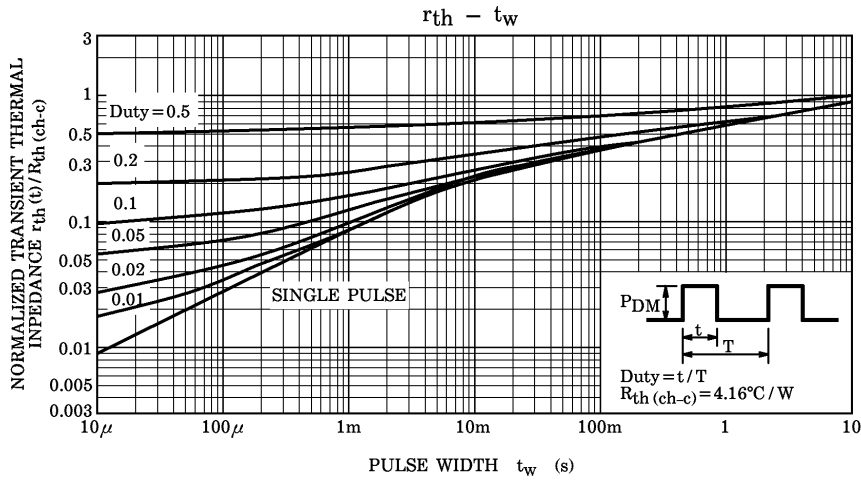
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-20	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -5A, V_{GS} = 0V$	—	—	2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -5A, V_{GS} = 0V$	—	210	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 100A / \mu s$	—	1.2	—	μC

MARKING









Peak $I_{AR} = -5A$, $R_G = 25\Omega$
 $V_{DD} = -50V$, $L = 12.6mH$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$