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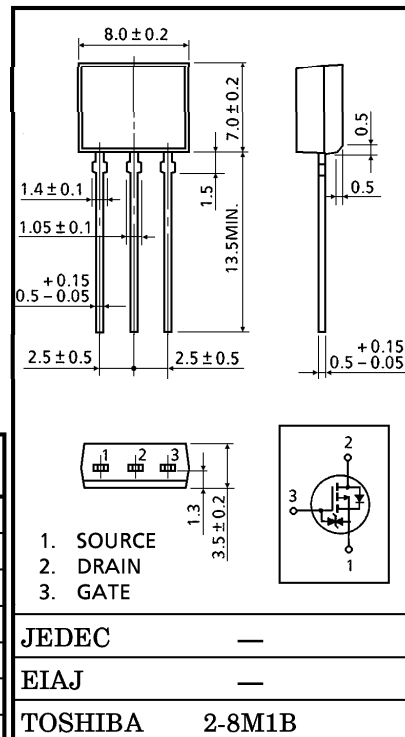
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 RELAY DRIVE, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS
 Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.16\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\mu A$ (Max.) ($V_{DS} = -60V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0V$
 ($V_{DS} = -10V, I_D = -1mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	-60	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	-60	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	DC	-5	A
	Pulse	-20	A
Drain Power Dissipation (Ta = 25°C)	P_D	1.3	W
Single Pulse Avalanche Energy**	E_{AS}	273	mJ
Avalanche Current	I_{AR}	-5	A
Repetitive Avalanche Energy*	E_{AR}	0.13	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C



Weight : 0.54g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	96.1	°C/W

Note ;

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

** $V_{DD} = -25V$, Starting $T_{ch} = 25°C$, $L = 14.84mH$, $R_G = 25\Omega$, $I_{AR} = -5A$

**This transistor is an electrostatic sensitive device.
 Please handle with caution.**

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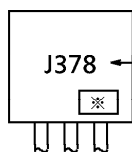
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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}	$V_{DS} = -60V, V_{GS} = 0V$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V(BR)_{DSS}$	$I_D = -10mA, V_{GS} = 0V$	-60	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10V, I_D = -1mA$	-0.8	—	-2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = -4V, I_D = -2.5A$	—	0.24	0.28	Ω
			$V_{GS} = -10V, I_D = -2.5A$	—	0.16	0.19	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10V, I_D = -2.5A$	2.0	4.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1MHz$	—	630	—	pF
Reverse Transfer Capacitance		C_{rss}		—	95	—	
Output Capacitance		C_{oss}		—	290	—	
Switching Time	Rise Time	t_r	<p>$V_{GS} = 0V, -10V$ $I_D = -2.5A$ $R_L = 12\Omega$ $V_{DD} = -30V$</p>	—	25	—	ns
	Turn-on Time	t_{on}		—	45	—	
	Fall Time	t_f		—	55	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5ns$ $Duty \leq 1\%, t_w = 10\mu s$	—	200	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -48V, V_{GS} = -10V$ $I_D = -5A$	—	22	—	nC
Gate-Source Charge		Q_{gs}		—	16	—	
Gate-Drain (“Miller”) Charge		Q_{gd}		—	6	—	

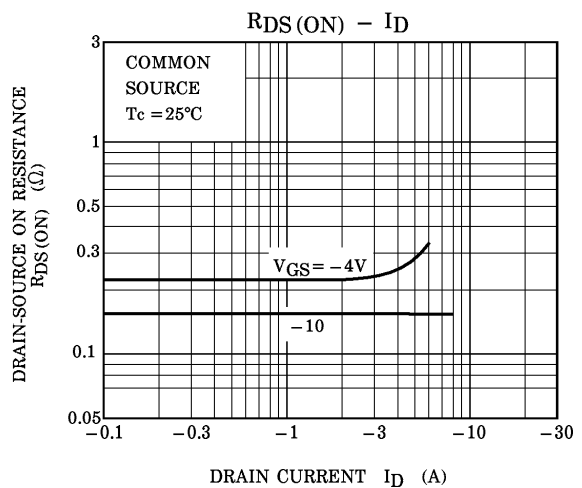
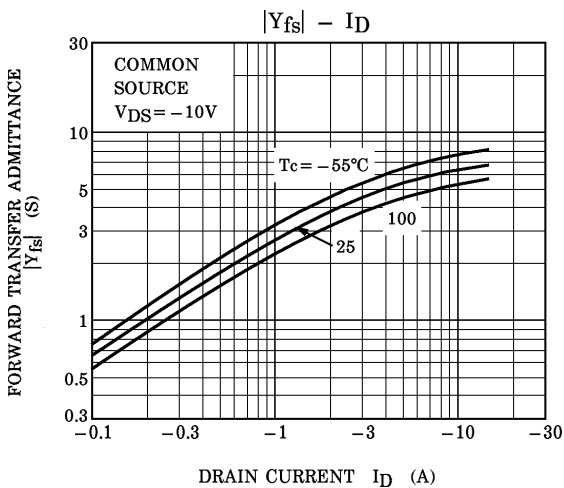
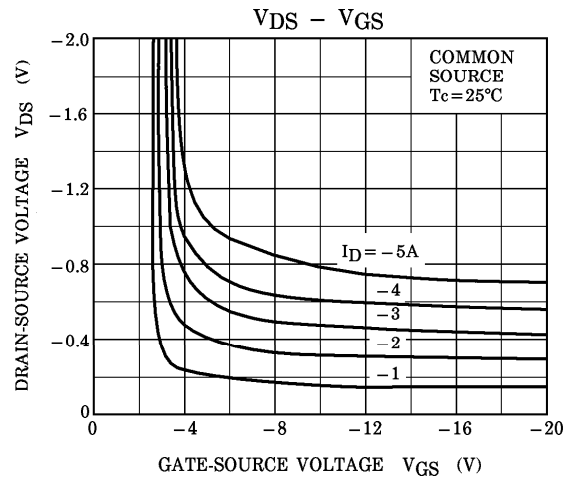
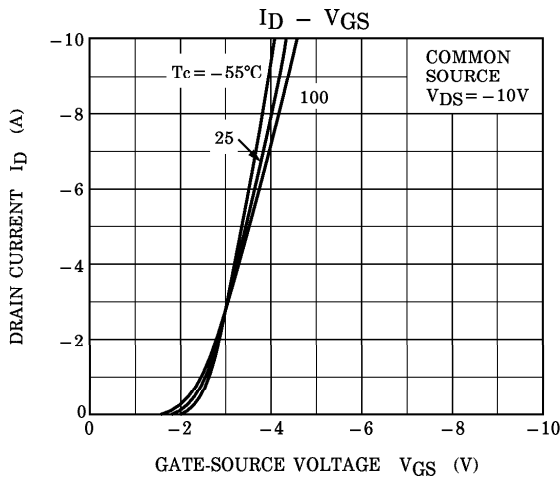
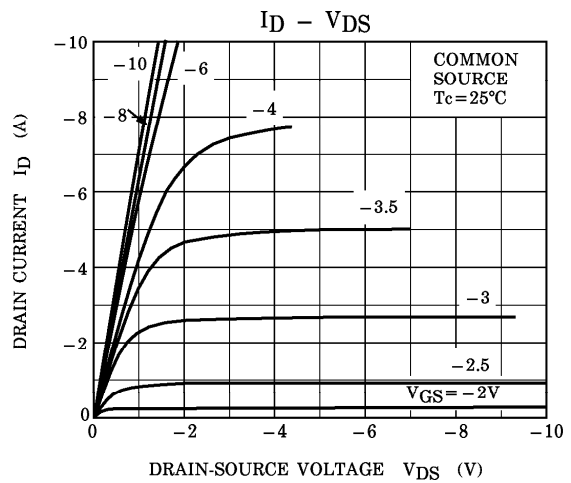
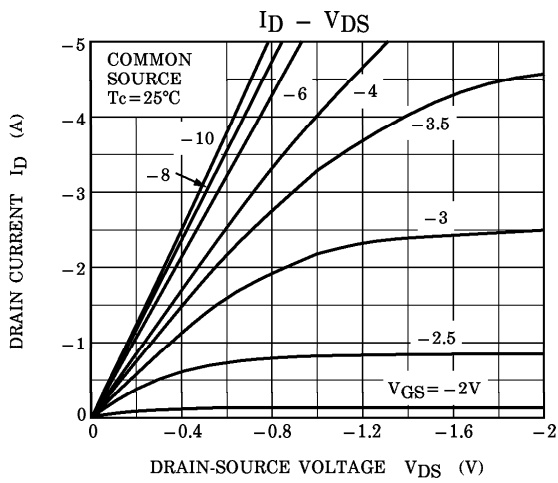
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

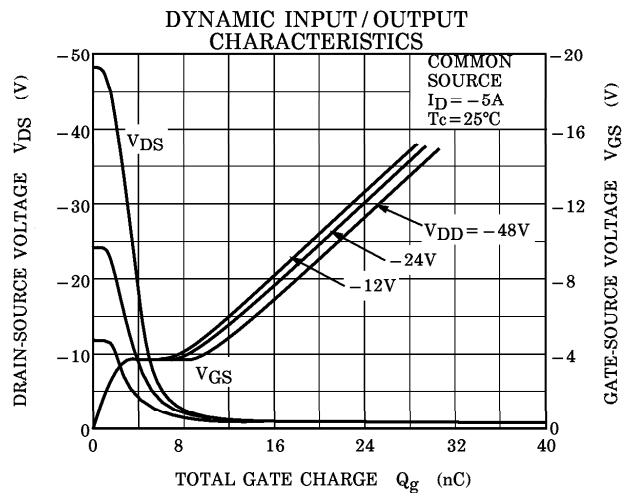
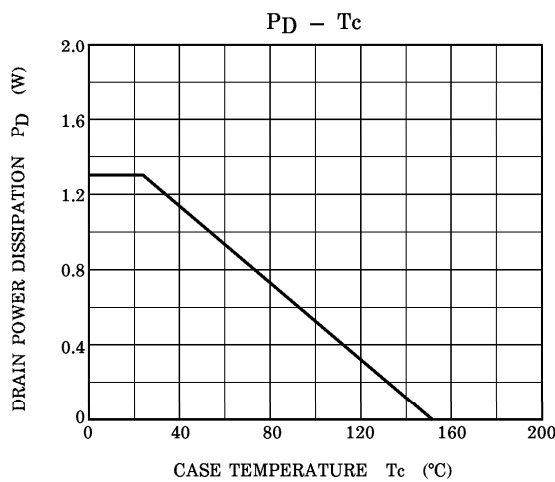
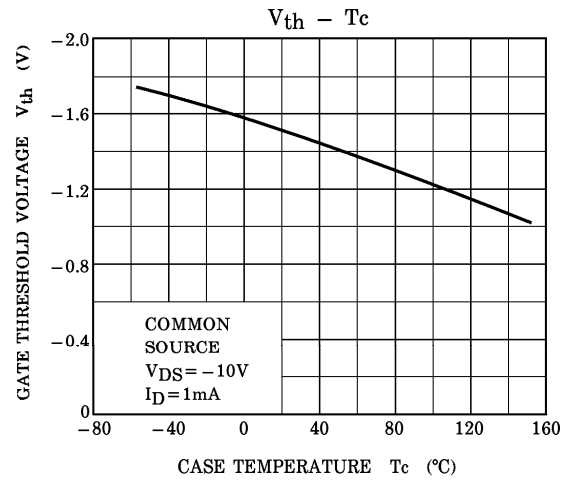
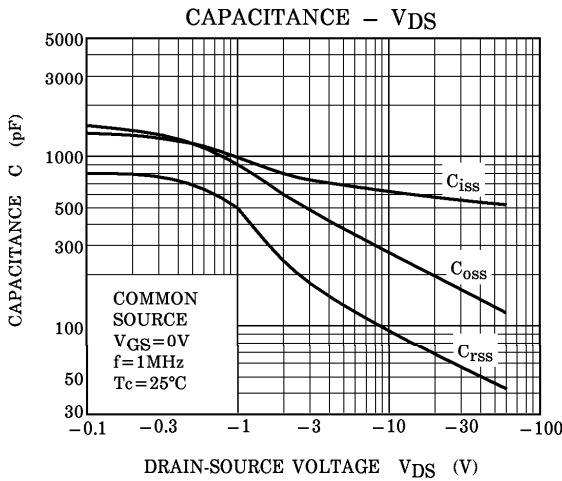
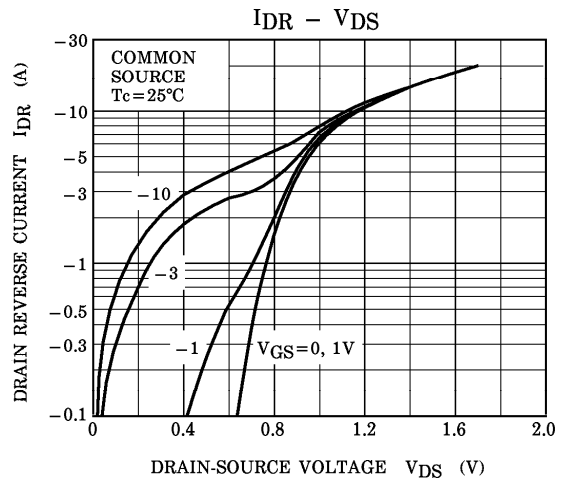
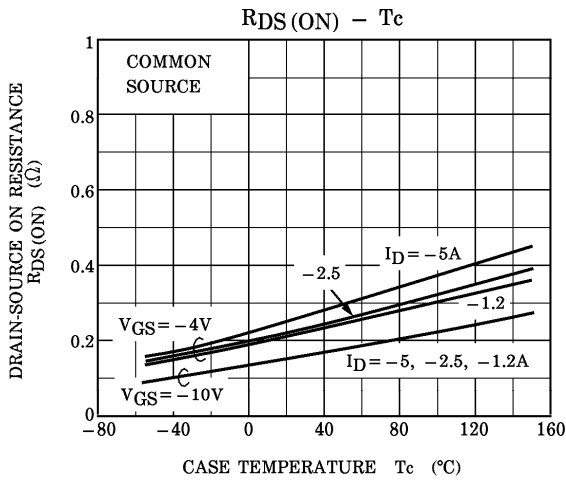
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-20	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -5A, V_{GS} = 0V$	—	—	1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -5A, V_{GS} = 0V$ $dI_{DR}/dt = 50A/\mu s$	—	80	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.1	—	μC

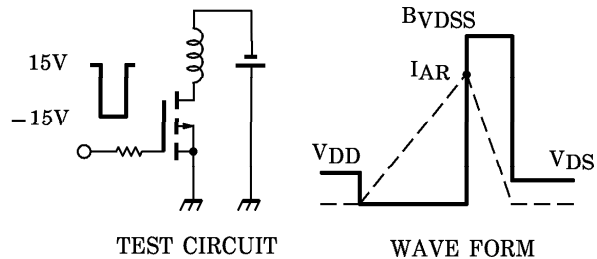
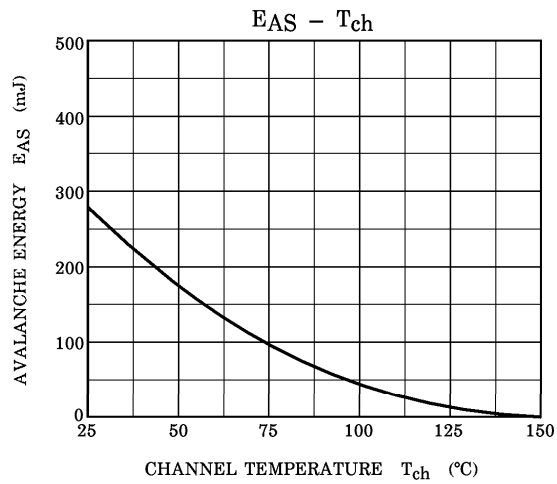
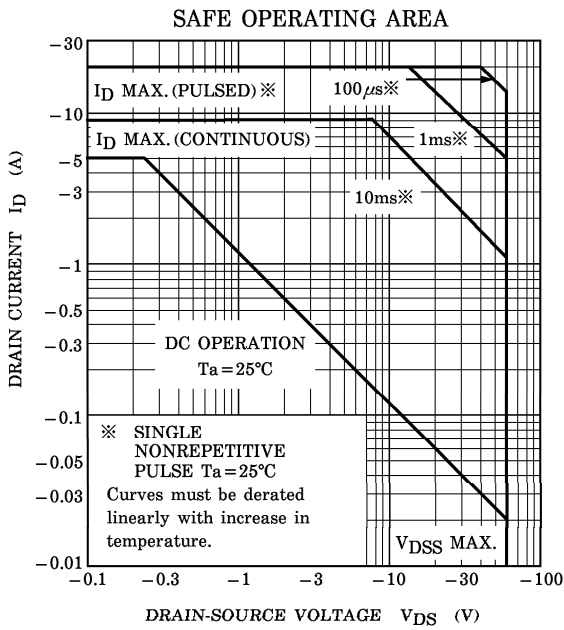
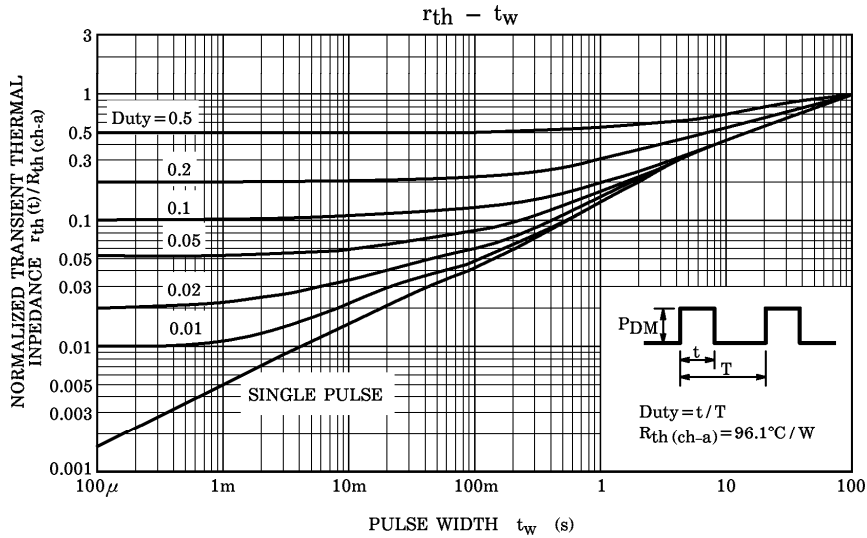
MARKING



J378 ← TYPE
 ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







Peak $I_{AR} = -5A$, $R_G = 25\Omega$
 $V_{DD} = -25V$, $L = 14.84mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$$