

# 2SJ537

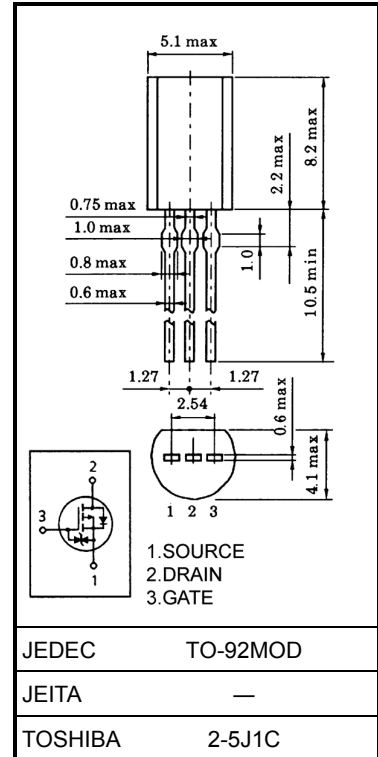
Chopper Regulator, DC-DC Converter and Motor Drive Applications

Unit: mm

- Low drain-source ON resistance :  $R_{DS(ON)} = 0.16 \Omega$  (typ.)
- High forward transfer admittance :  $|Y_{fs}| = 3.5 S$  (typ.)
- Low leakage current :  $I_{DSS} = -100 \mu A$  ( $V_{DS} = -50 V$ )
- Enhancement-mode :  $V_{th} = -0.8 \sim -2.0 V$  ( $V_{DS} = -10 V, I_D = -1 mA$ )

### Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		$V_{DSS}$	-50	V
Drain-gate voltage ( $R_{GS} = 20 k\Omega$ )		$V_{DGR}$	-50	V
Gate-source voltage		$V_{GSS}$	$\pm 20$	V
Drain current	DC (Note 1)	$I_D$	-5	A
	Pulse (Note 1)	$I_{DP}$	-15	A
Drain power dissipation		$P_D$	0.9	W
Channel temperature		$T_{ch}$	150	°C
Storage temperature range		$T_{stg}$	-55~150	°C



JEDEC	TO-92MOD
JEITA	—
TOSHIBA	2-5J1C

Weight: 0.36 g (typ.)

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

### Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	138	°C / W

Note 1: Please use devices on condition that the channel temperature is below 150°C.

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

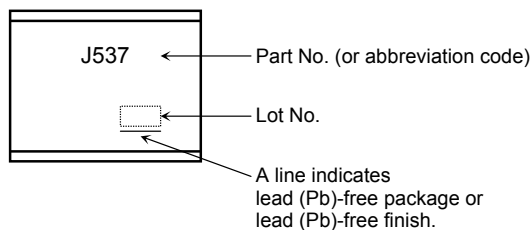
## Electrical Characteristics (Ta = 25°C)

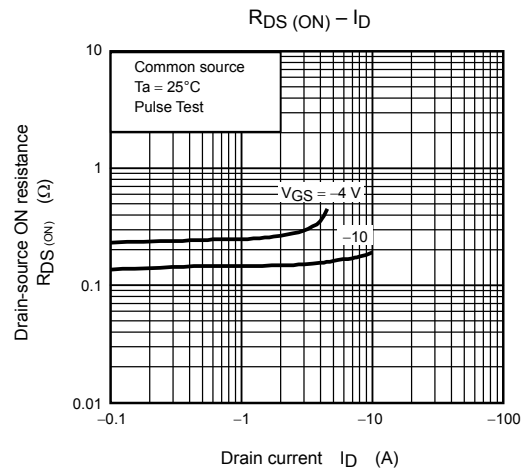
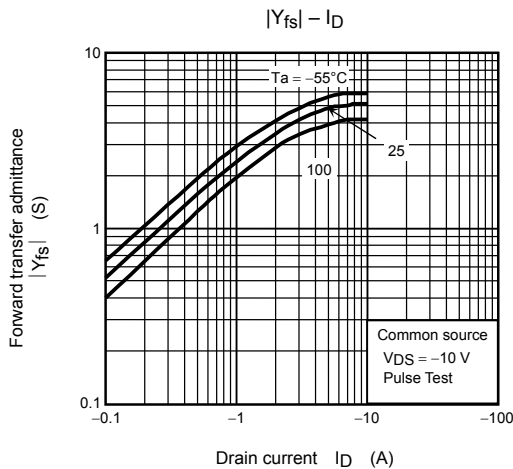
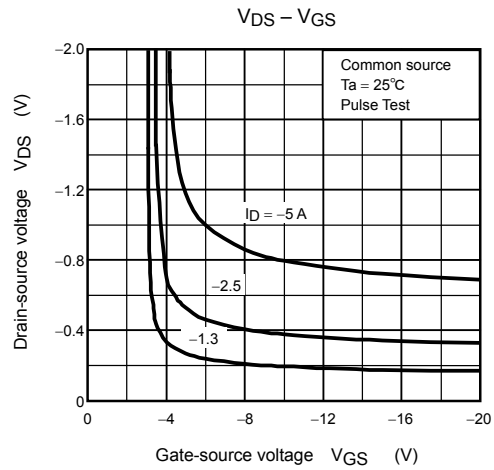
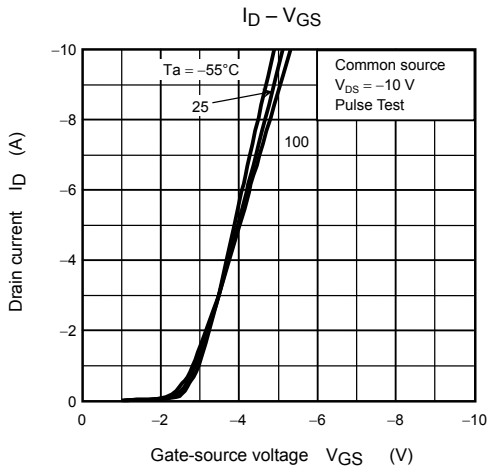
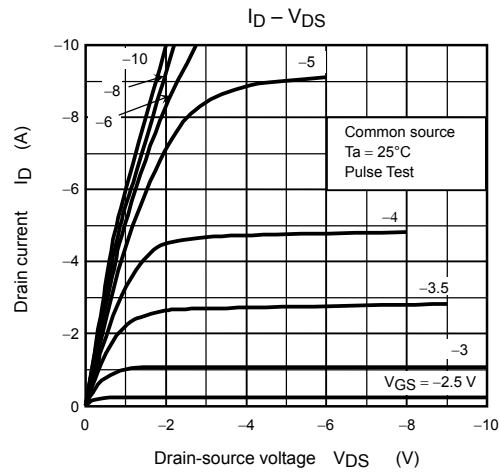
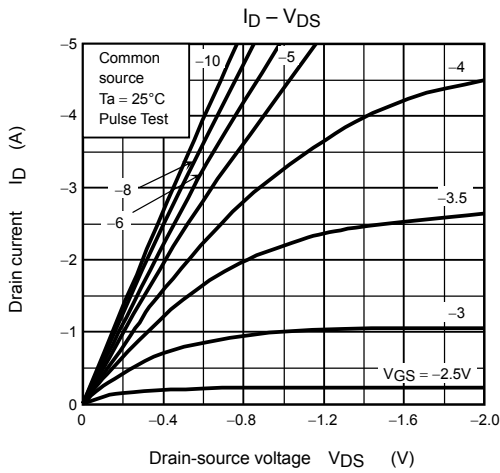
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain cut-off current		$I_{DSS}$	$V_{DS} = -50\text{ V}, V_{GS} = 0\text{ V}$	—	—	-100	$\mu\text{A}$
Drain-source breakdown voltage		$V_{(BR) DSS}$	$I_D = -10\text{ mA}, V_{GS} = 0\text{ V}$	-50	—	—	V
Gate threshold voltage		$V_{th}$	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-0.8	—	-2.0	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = -4\text{ V}, I_D = -1.3\text{ A}$	—	0.27	0.34	$\Omega$
			$V_{GS} = -10\text{ V}, I_D = -2.5\text{ A}$	—	0.16	0.19	
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -2.5\text{ A}$	1.5	3.5	—	S
Input capacitance		$C_{iss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	470	—	pF
Reverse transfer capacitance		$C_{rss}$		—	60	—	
Output capacitance		$C_{oss}$		—	210	—	
Switching time	Rise time	$t_r$	<p><math>V_{GS} = 0\text{ V}, -10\text{ V}</math>  <math>I_D = -2.5\text{ A}</math>  <math>V_{OUT}</math>  <math>R_L = 10\ \Omega</math>  <math>V_{DD} = -25\text{ V}</math>  <math>4.7\ \Omega</math>                      Duty <math>\leq 1\%</math>, <math>t_W = 10\ \mu\text{s}</math></p>	—	25	—	ns
	Turn-on time	$t_{on}$		—	35	—	
	Fall time	$t_f$		—	20	—	
	Turn-off time	$t_{off}$		—	120	—	
Total gate charge (Gate-source plus gate-drain)		$Q_g$	$V_{DD} = -40\text{ V}, V_{GS} = -10\text{ V}, I_D = -5\text{ A}$	—	18	—	nC
Gate-source charge		$Q_{gs}$		—	13	—	
Gate-drain ("miller") charge		$Q_{gd}$		—	5	—	

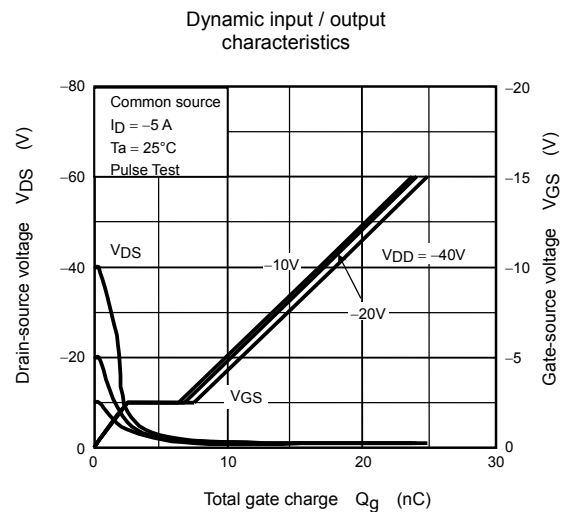
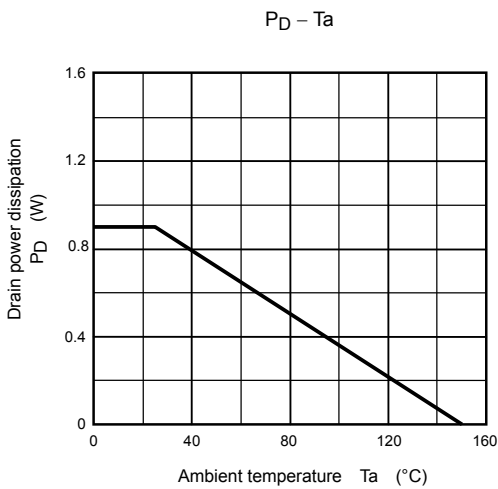
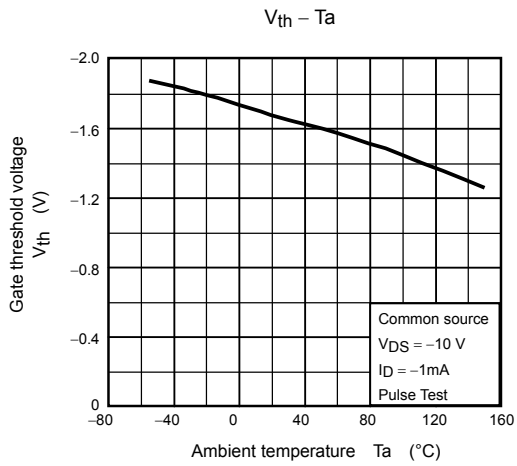
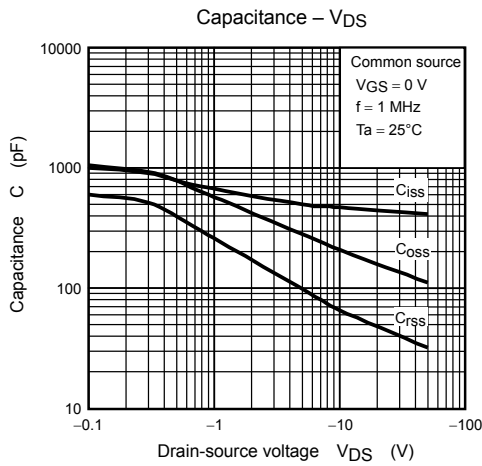
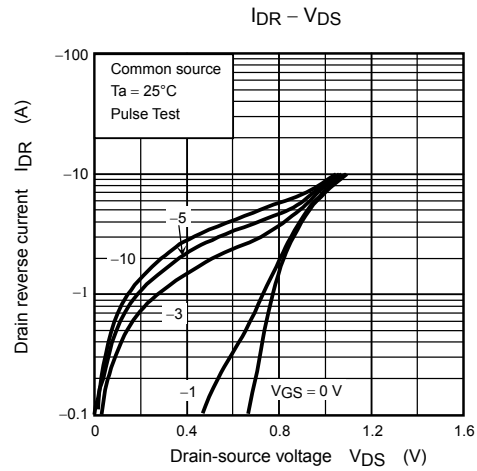
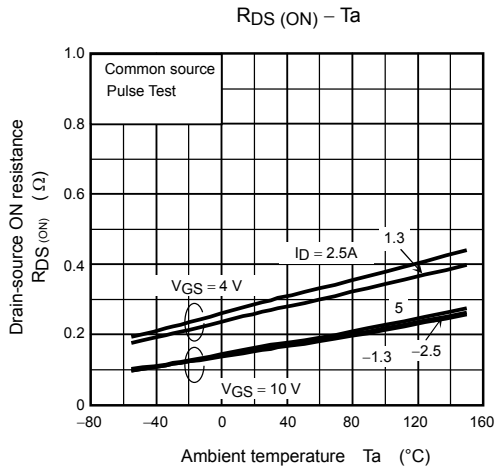
## Source-Drain Ratings and Characteristics (Ta = 25°C)

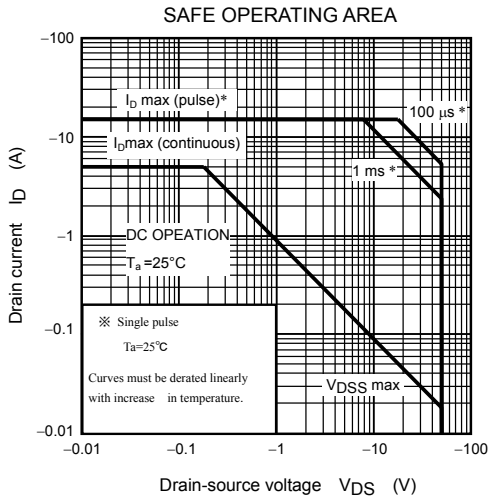
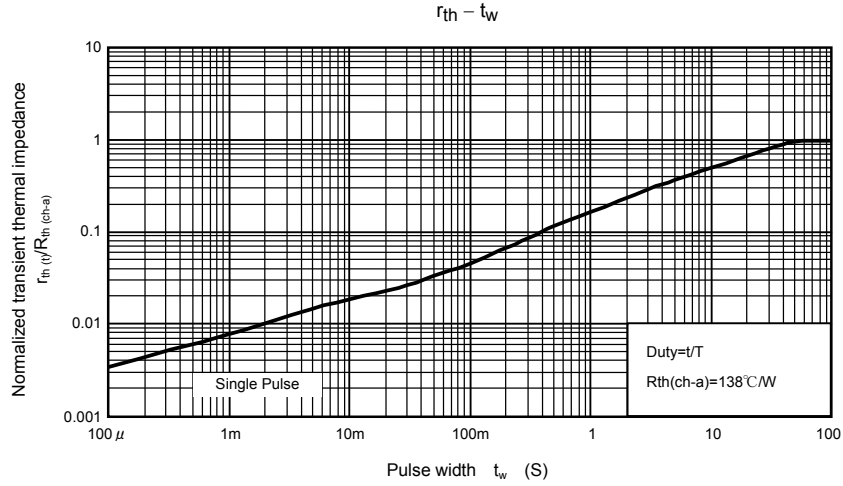
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	$I_{DR}$	—	—	—	-5	A
Pulse drain reverse current (Note 1)	$I_{DRP}$	—	—	—	-15	A
Forward voltage (diode)	$V_{DSF}$	$I_{DR} = -5\text{ A}, V_{GS} = 0\text{ V}$	—	—	1.5	V

## Marking









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20070701-EN

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