

2SK2615

DC-DC Converter, Relay Drive and Motor Drive Applications

- Low drain-source ON resistance : $R_{DS(ON)} = 0.23 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 2.0 \text{ S}$ (typ.)
- Low leakage current : $IDSS = 100 \mu\text{A}$ (max) ($V_{DS} = 60 \text{ V}$)
- Enhancement mode : $V_{th} = 0.8 \text{ to } 2.0 \text{ V}$ ($V_{DS} = 10 \text{ V}$, $ID = 1 \text{ mA}$)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V _{DSS}	60	V
Drain-gate voltage ($R_{GS} = 20\text{ k}\Omega$)	V _{DGR}	60	V
Gate-source voltage	V _{GSS}	± 20	V
Drain current	DC (Note 1)	I _D	A
	Pulse (Note 1)	I _{DP}	
Drain power dissipation	P _D	0.5	W
Drain power dissipation (Note 2)	P _D	1.5	W
Channel temperature	T _{ch}	150	°C
Storage temperature range	T _{stg}	-55 to 150	°C

Unit: mm

4.6MAX.

1.7MAX.

0.4 ± 0.05

1.6MAX.

0.45 - 0.05

+0.08
0.45 - 0.05

+0.08
0.4 - 0.05

2.5 ± 0.1

0.8MMN.

4.2MAX.

+0.08
0.4 - 0.05

1.5 ± 0.1

1.5 ± 0.1

1 2 3

1. GATE
2. DRAIN
(HEAT SINK)
3. SOURCE

20°

1 30°

Weight: 0.05 g (typ.)

Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2: Mounted on a ceramic substrate (25.4 mm × 25.4 mm × 0.8 mm)

Note 3: 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	$R_{th\ (ch-a)}$	250	°C / W

This transistor is an electrostatic-sensitive device.

Please handle with caution.

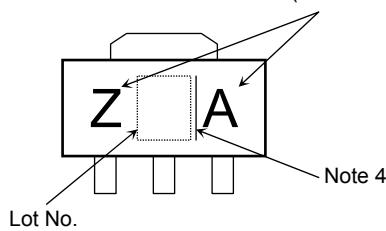
Note 4: A line to the right of a Lot No. identifies the indication of product Labels.

Without a line: [[Pb]]/INCLUDES > MCV

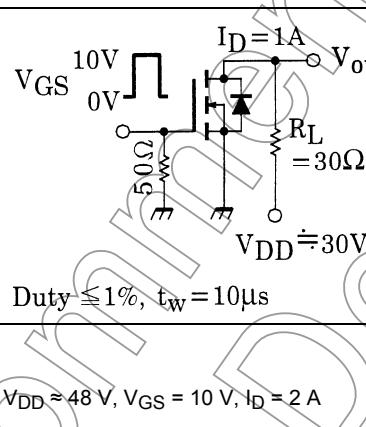
With a line: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Part No. (or abbreviation code)

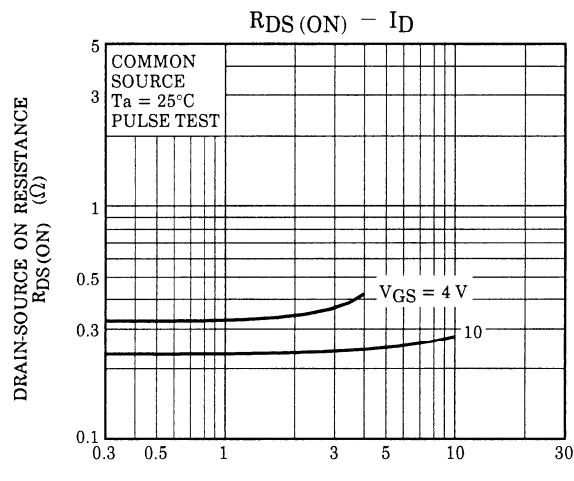
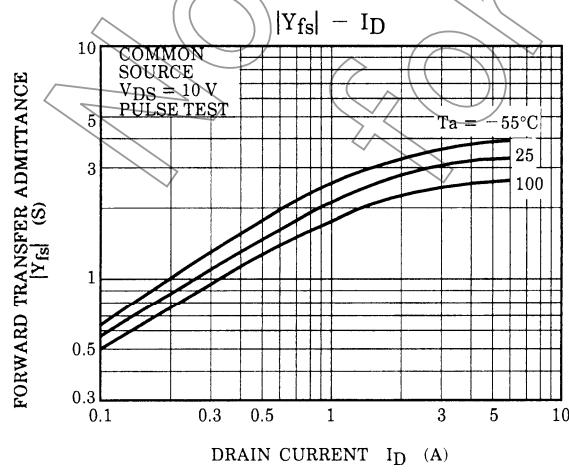
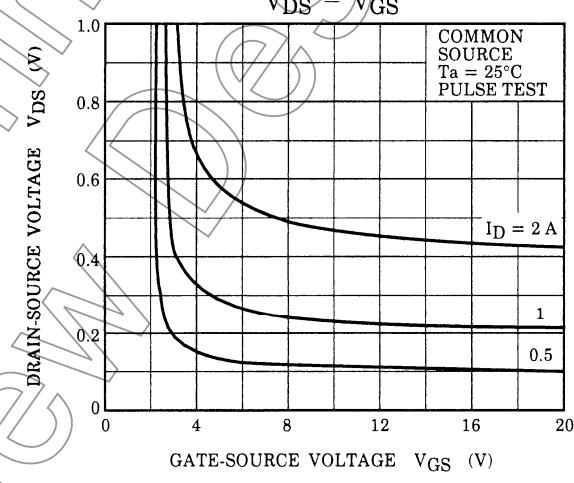
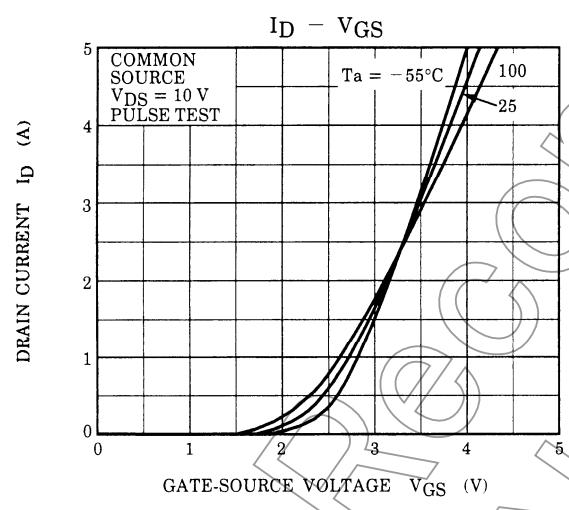
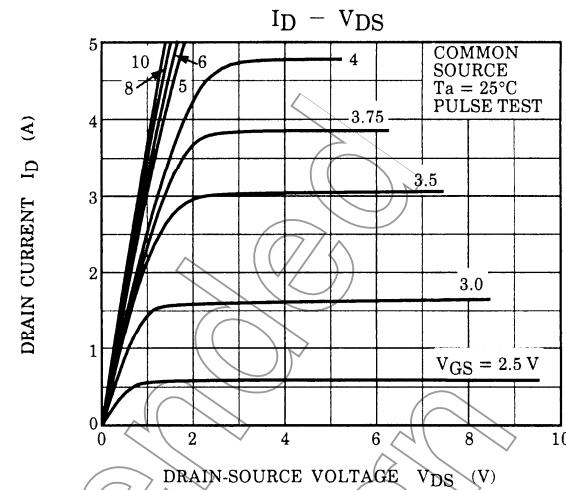
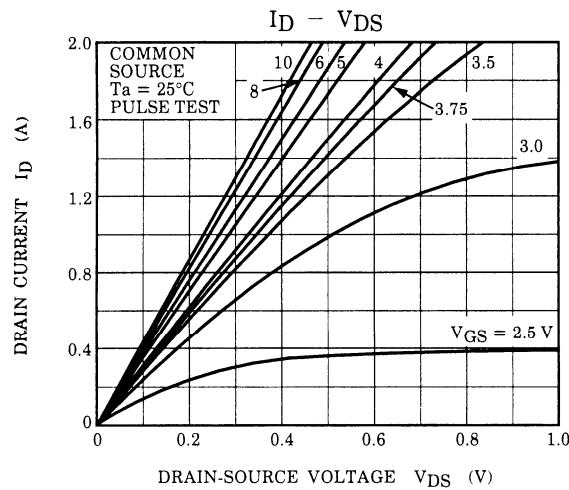


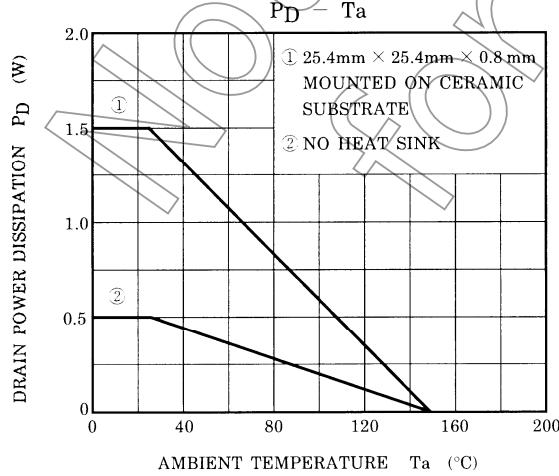
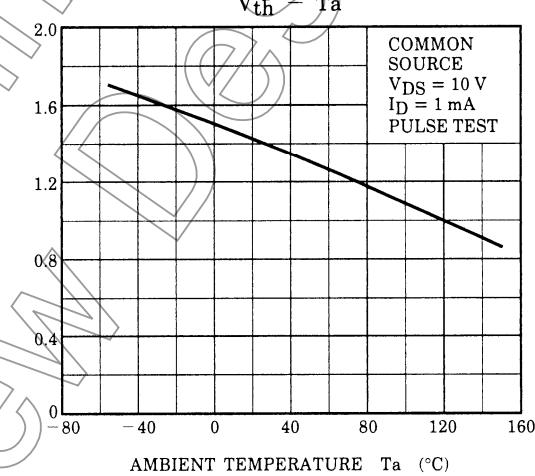
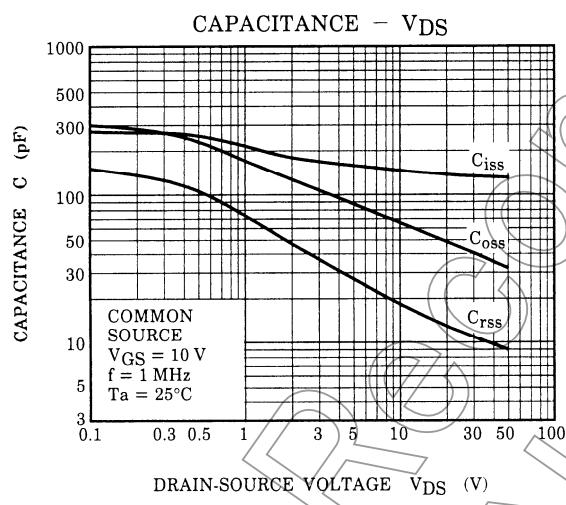
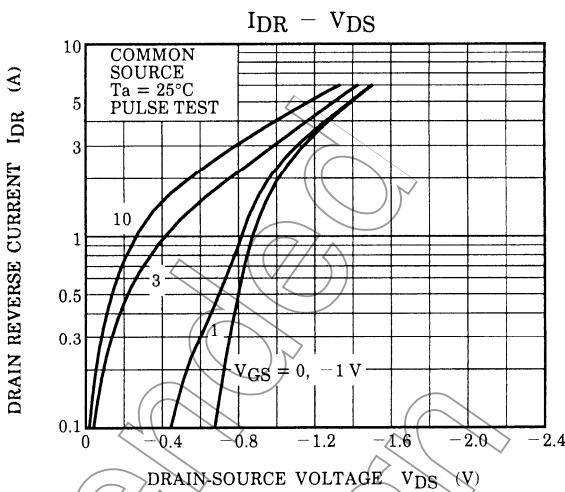
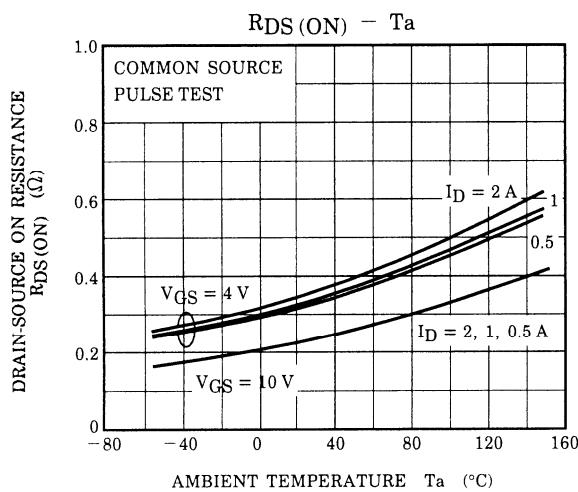
Electrical Characteristics ($T_a = 25^\circ C$)

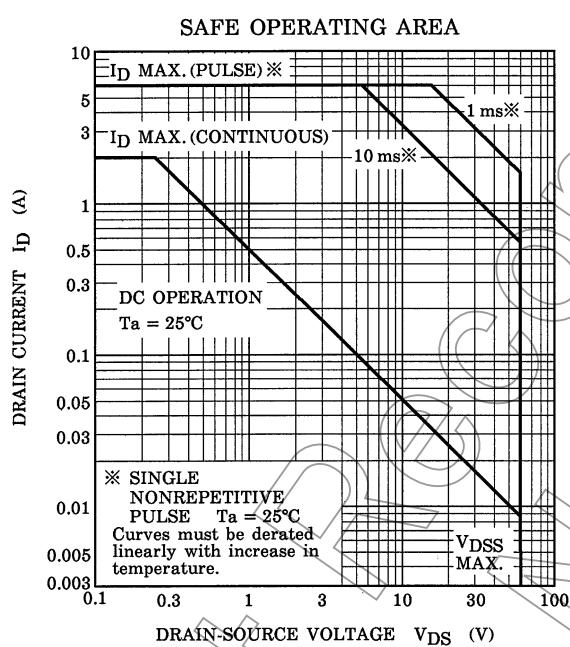
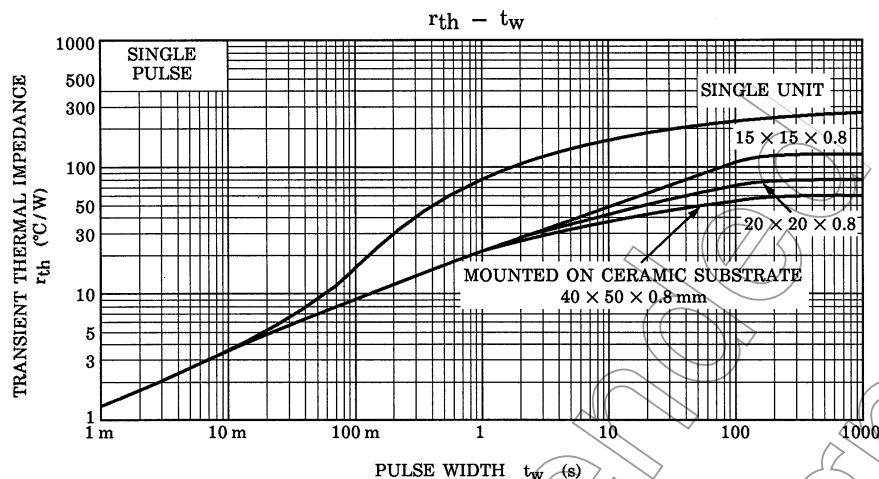
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 16 V, V_{DS} = 0 V$	—	—	± 10	μA
Drain cut-off current	I_{DSS}	$V_{DS} = 60 V, V_{GS} = 0 V$	—	—	100	μA
Drain-source breakdown voltage	$V_{(BR) DSS}$	$I_D = 10 mA, V_{GS} = 0 V$	60	—	—	V
Gate threshold voltage	V_{th}	$V_{DS} = 10 V, I_D = 1 mA$	0.8	—	2.0	V
Drain-source ON resistance	$R_{DS (ON)}$	$V_{GS} = 4 V, I_D = 1 A$	—	0.33	0.44	Ω
		$V_{GS} = 10 V, I_D = 1 A$	—	0.23	0.30	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 10 V, I_D = 1 A$	1.0	2.0	—	S
Input capacitance	C_{iss}	$V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz$	—	150	—	pF
Reverse transfer capacitance	C_{rss}		—	25	—	
Output capacitance	C_{oss}		—	70	—	
Switching time	Rise time	t_r		—	25	—
	Turn-on time	t_{on}		—	30	—
	Fall time	t_f		—	50	—
	Turn-off time	t_{off}		—	150	—
Total gate charge (gate-source plus gate-drain)	Q_g	$V_{DD} \approx 48 V, V_{GS} = 10 V, I_D = 2 A$	—	6.0	—	nC
Gate-source charge	Q_{gs}		—	4.6	—	
Gate-drain ("miller") Charge	Q_{gd}		—	1.4	—	

Source-Drain Ratings and Characteristics ($T_a = 25^\circ C$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	2	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	6	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 2 A, V_{GS} = 0 V$	—	—	-1.5	V
Reverse recovery time	t_{rr}	$I_{DR} = 2 A, V_{GS} = 0 V$ $dI_{DR} / dt = 50 A / \mu s$	—	100	—	ns
Reverse recovery charge	Q_{rr}		—	40	—	nC







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