

2SK3797

Switching Regulator Applications

- Low drain-source ON resistance: $R_{DS(ON)} = 0.32 \Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 7.5 \text{ S}$ (typ.)
- Low leakage current: $I_{DSS} = 100 \mu\text{A}$ ($V_{DS} = 600 \text{ V}$)
- Enhancement model: $V_{th} = 2.0 \text{ to } 4.0 \text{ V}$ ($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V _{DSS}	600	V
Drain-gate voltage ($R_{GS} = 20\text{ k}\Omega$)	V _{DGR}	600	V
Gate-source voltage	V _{GSS}	± 30	V
Drain current	DC (Note 1)	I _D	13
	Pulse ($t = 1\text{ ms}$) (Note 1)	I _{DP}	52
Drain power dissipation ($T_c = 25^\circ\text{C}$)	P _D	50	W
Single pulse avalanche energy (Note 2)	E _{AS}	1033	mJ
Avalanche current	I _{AR}	13	A
Repetitive avalanche energy (Note 3)	E _{AR}	5.0	mJ
Channel temperature	T _{ch}	150	°C
Storage temperature range	T _{stg}	-55 to 150	°C

Unit: mm

Dimensions (mm):

- Top View: $\phi 3.2 \pm 0.2$, 10 ± 0.3 , 2.7 ± 0.2 , 15 ± 0.3 , 3.9 ± 0.3 , 13 ± 0.5 , 2.8Max , 1.14 ± 0.15 , 0.69 ± 0.15 , $\phi 0.2 \text{M}$, 2.54 , 2.54 , 0.64 ± 0.15 , 2.6 ± 0.1 , 4.5 ± 0.2 .
- Bottom View: 1 , 2 , 3 .

Legend:

- 1: Gate
- 2: Drain
- 3: Source

Notes: The drawing is not to scale.

Weight: 1.7 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

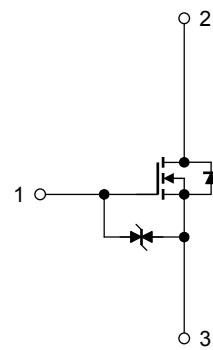
Characteristic	Symbol	Max	Unit
Thermal resistance, channel to case	R_{th} (ch-c)	2.5	°C/W
Thermal resistance, channel to ambient	R_{th} (ch-a)	62.5	°C/W

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

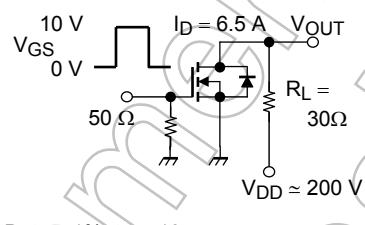
Note 2: $V_{DD} = 90$ V, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 10.7$ mH, $I_{AR} = 13$ A, $R_G = 25$ Ω

Note 3: Repetitive rating: pulse width limited by maximum channel temperature

This transistor is an electrostatic-sensitive device. Handle with care.



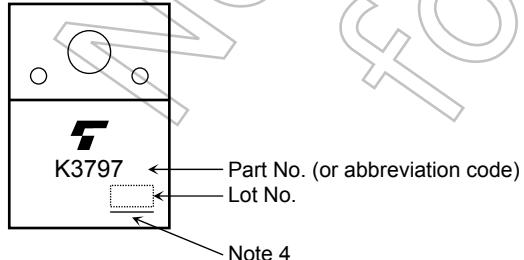
Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I _{GSS}	V _{GS} = ±25 V, V _{DS} = 0 V	—	—	±10	μA	
Gate-source breakdown voltage	V _{(BR) GSS}	I _G = ±10 μA, V _{DS} = 0 V	±30	—	—	V	
Drain cutoff current	I _{DSS}	V _{DS} = 600 V, V _{GS} = 0 V	—	—	100	μA	
Drain-source breakdown voltage	V _{(BR) DSS}	I _D = 10 mA, V _{GS} = 0 V	600	—	—	V	
Gate threshold voltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0	—	4.0	V	
Drain-source ON resistance	R _{DS} (ON)	V _{GS} = 10 V, I _D = 6.5 A	—	0.32	0.43	Ω	
Forward transfer admittance	Y _{fs}	V _{DS} = 10 V, I _D = 7.0 A	2.1	7.5	—	S	
Input capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	—	3100	—	pF	
Reverse transfer capacitance	C _{rss}		—	20	—		
Output capacitance	C _{oss}		—	270	—		
Switching time	Rise time	t _r	 Duty ≤ 1%, t _W = 10 μs	—	60	—	ns
	Turn-on time	t _{on}		—	110	—	
	Fall time	t _f		—	50	—	
	Turn-off time	t _{off}		—	215	—	
Total gate charge	Q _g	V _{DD} ≈ 400 V, V _{GS} = 10 V, I _D = 13 A	—	62	—	nC	
Gate-source charge	Q _{gs}		—	40	—		
Gate-drain charge	Q _{gd}		—	22	—		

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

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	—	—	—	13	A
Pulse drain reverse current (Note 1)	I _{DRP}	—	—	—	52	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 13 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse recovery time	t _{rr}	I _{DR} = 13 A, V _{GS} = 0 V, dI _{DR} /dt = 100 A/μs	—	1050	—	ns
Reverse recovery charge	Q _{rr}		—	15	—	μC

Marking

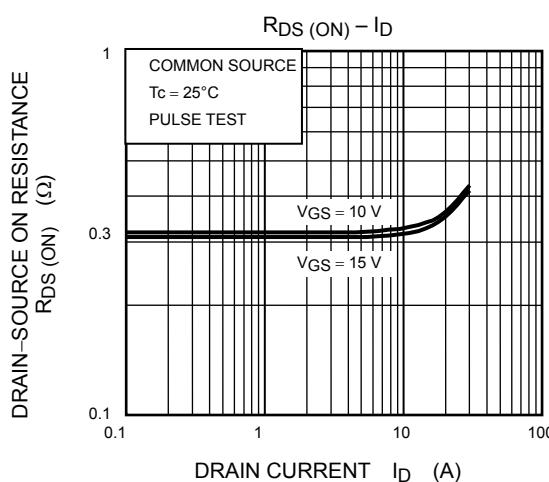
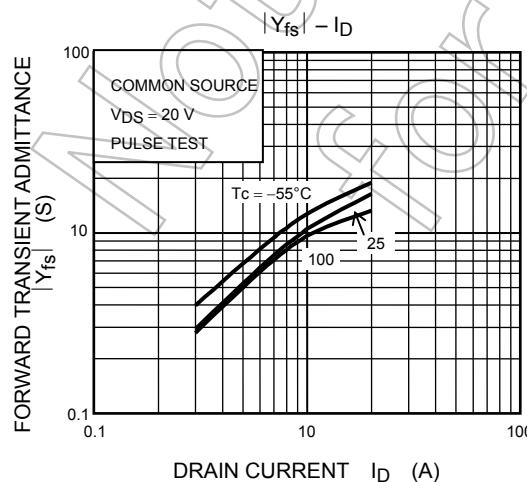
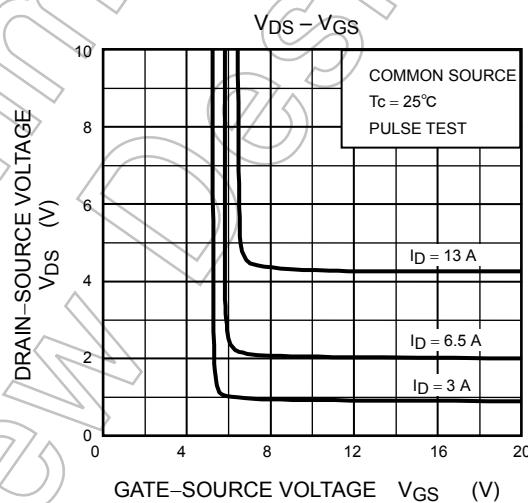
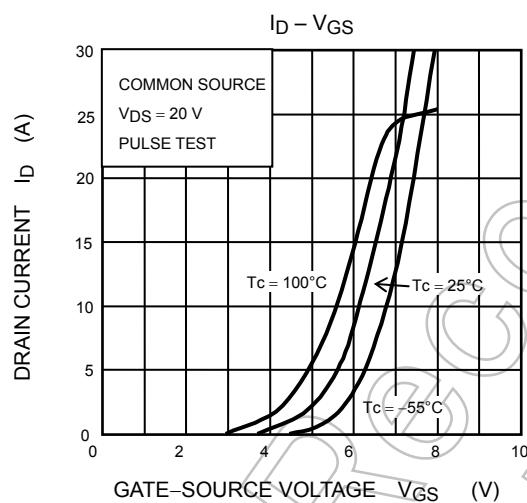
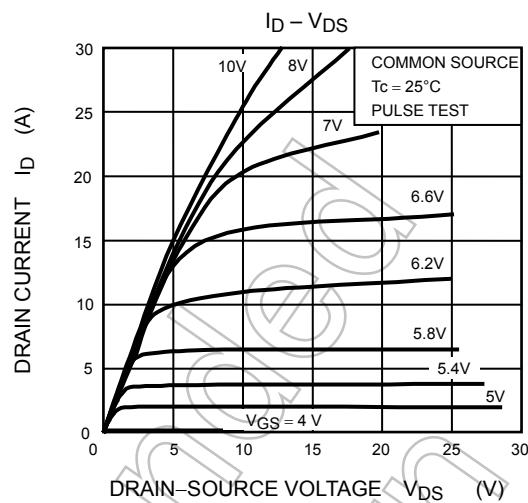
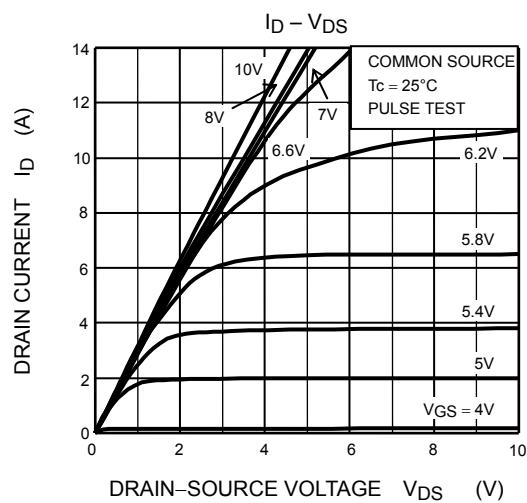


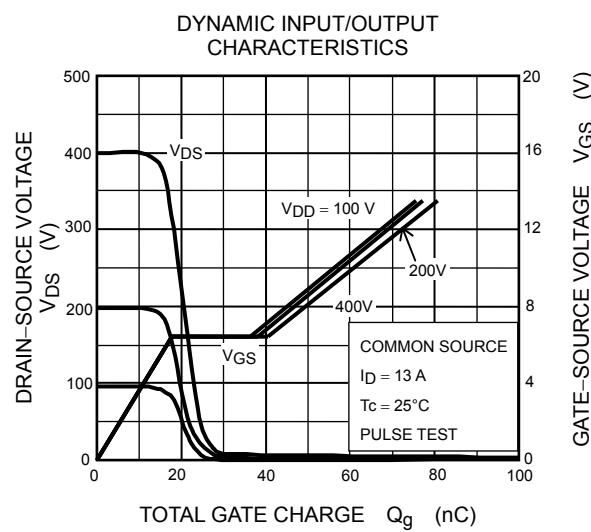
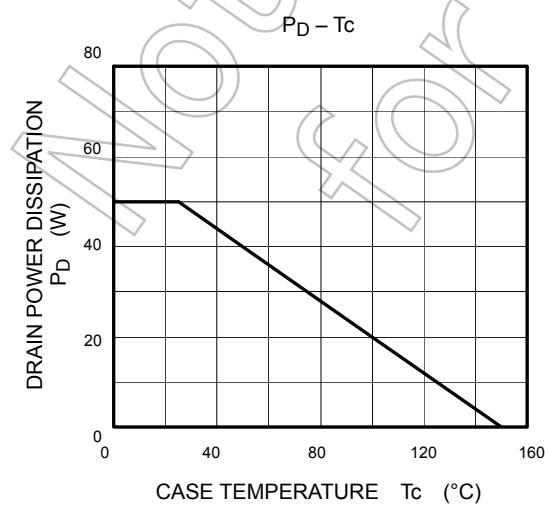
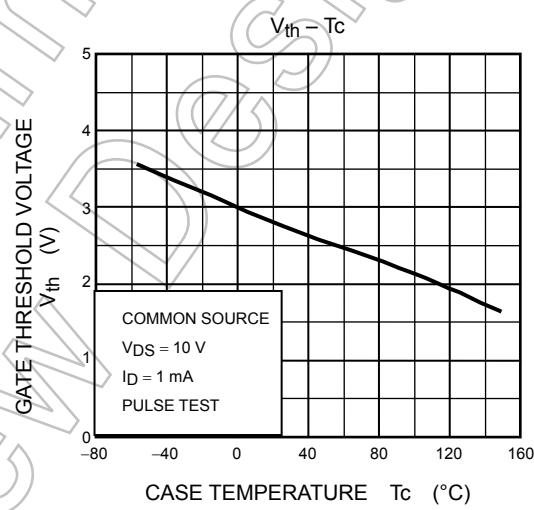
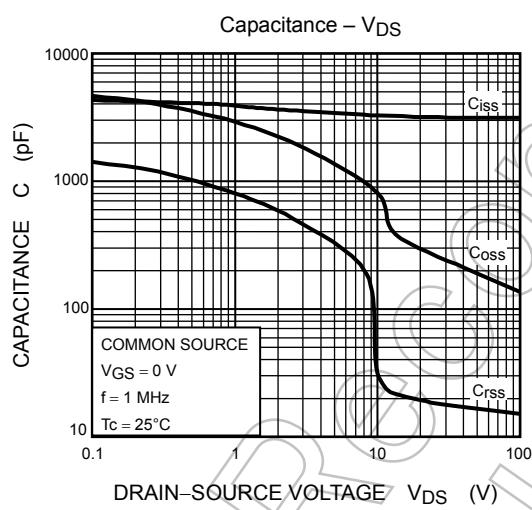
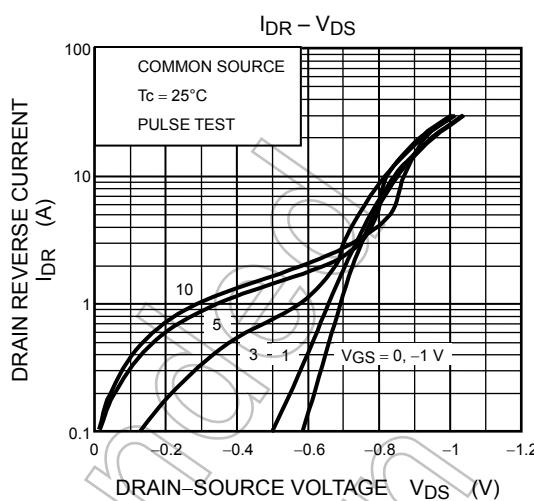
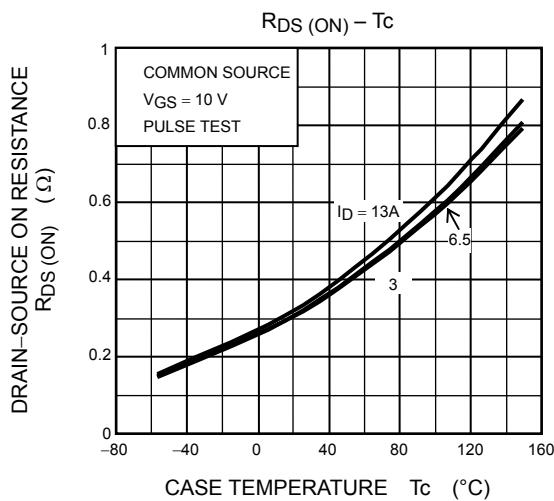
Note 4: A line under a Lot No. identifies the indication of product Labels.

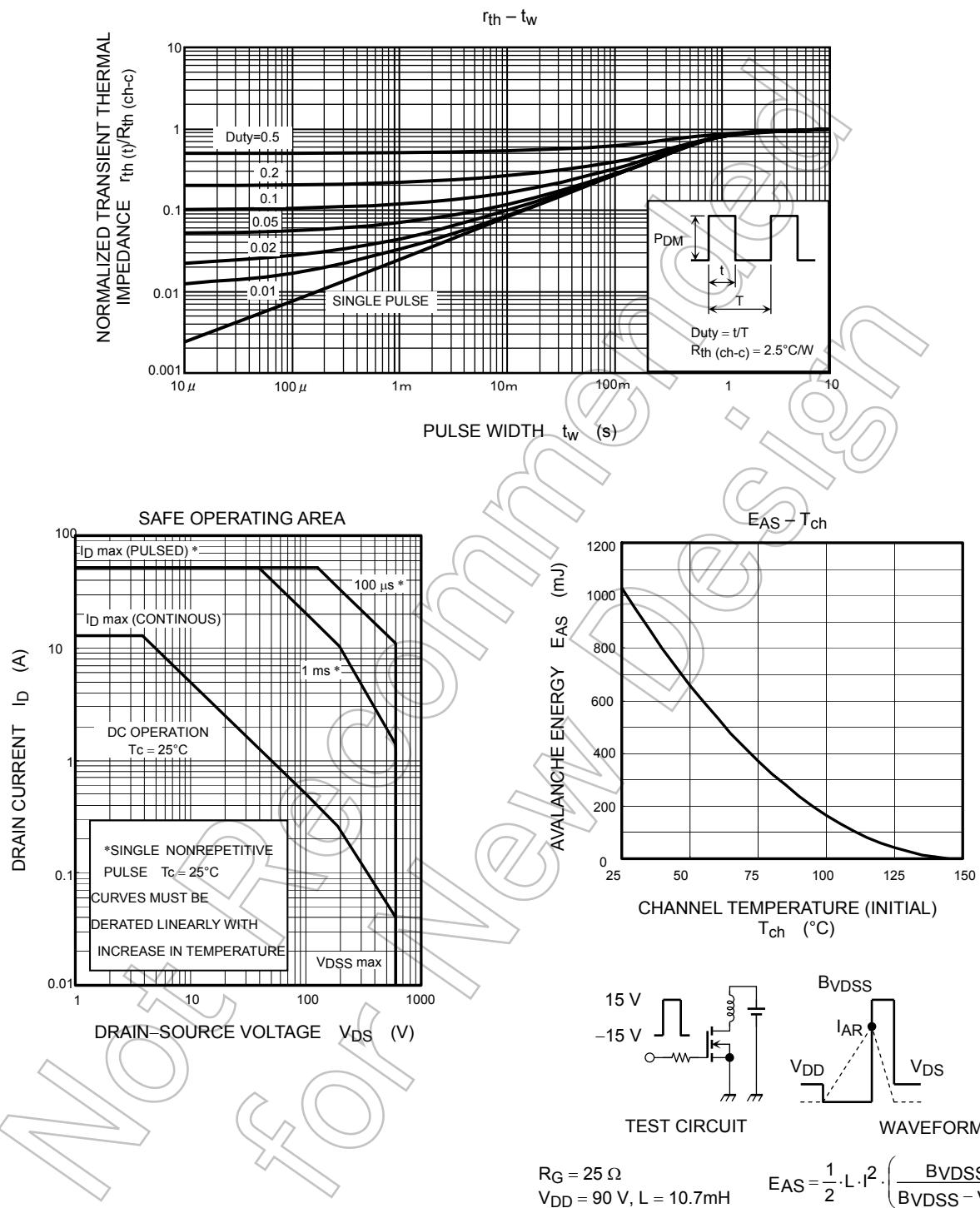
Not underlined: [[Pb]]/INCLUDES > MCV

Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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