

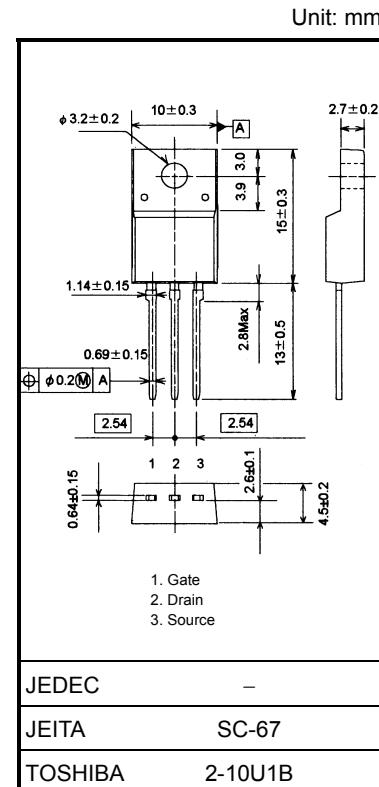
2SK3935

Switching Regulator Applications

- Low drain-source ON resistance : $R_{DS(\text{ON})} = 0.18\Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 10\text{ S}$ (typ.)
- Low leakage current : $ID_{SS} = 100\text{ }\mu\text{A}$ (max) ($V_{DS} = 450\text{ V}$)
- Enhancement model : $V_{th} = 2.0$ to 4.0 V
 $(V_{DS} = 10\text{ V}, ID = 1\text{ mA})$

Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V _{DSS}	450	V
Drain-gate voltage ($R_{GS} = 20\text{ k}\Omega$)	V _{DGR}	450	V
Gate-source voltage	V _{GSS}	± 30	V
Drain current	I _D	17	A
	I _{DP}	68	A
Drain power dissipation	P _D	50	W
Single pulse avalanche energy (Note 2)	E _{AS}	918	mJ
Avalanche current	I _{AR}	17	A
Repetitive avalanche energy (Note 3)	E _{AR}	5	mJ
Channel temperature	T _{ch}	150	°C
Storage temperature range	T _{stg}	-55~150	°C



Weight: 1.7 g (typ.)

Thermal Characteristics

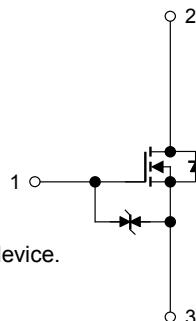
Characteristic	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th} \text{ (ch-c)}$	2.5	°C / W
Thermal resistance, channel to ambient	$R_{th} \text{ (ch-a)}$	62.5	°C / W

Note 1: Ensure that the channel temperature does not exceed 150°C during use of the device.

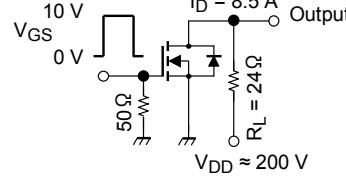
Note 2: $V_{DD} = 90$ V, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 5.3$ mH, $R_G = 25\Omega$, $I_{AR} = 17$ A

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

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



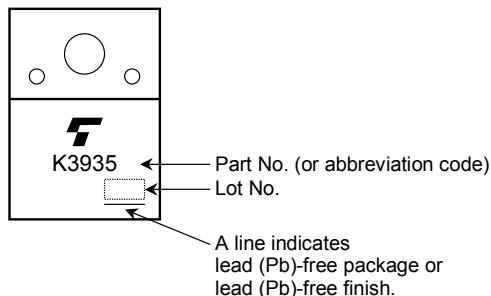
Electrical Characteristics (Ta = 25°C)

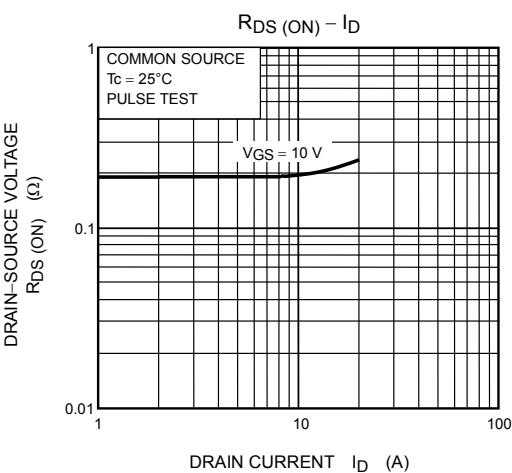
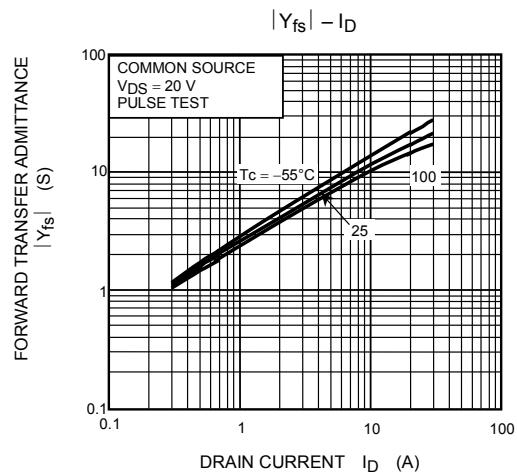
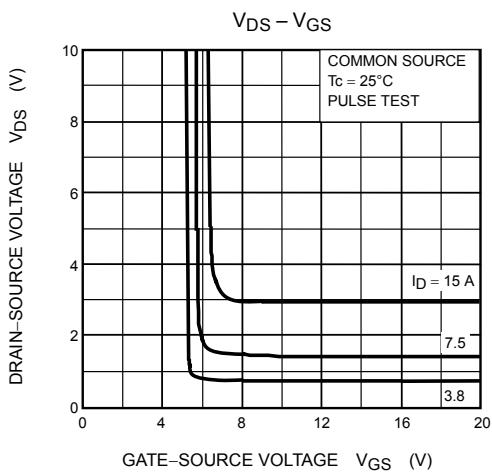
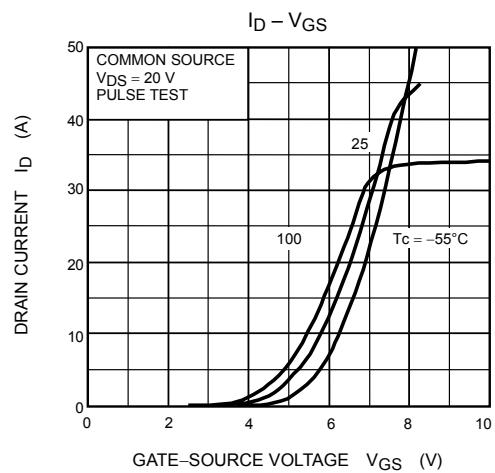
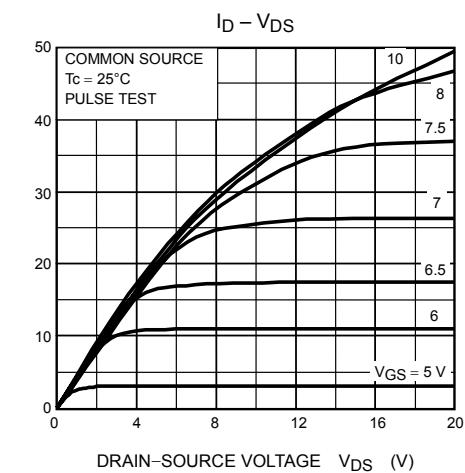
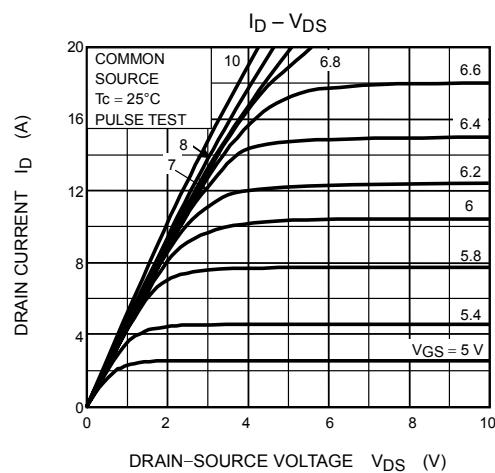
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I _{GSS}	V _{GS} = ±25 V, V _{DS} = 0 V	—	—	±10	μA
Drain-source breakdown voltage	V _{(BR) GSS}	I _G = ±10 μA, V _{GS} = 0 V	±30	—	—	V
Drain cutoff current	I _{DSS}	V _{DS} = 450 V, V _{GS} = 0 V	—	—	100	μA
Drain-source breakdown voltage	V _{(BR) DSS}	I _D = 10 mA, V _{GS} = 0 V	450	—	—	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 = 8.5 A	—	0.18	0.25	Ω
Forward transfer admittance	Y _{fs}	V _{DS} = 10 V, I _D = 8.5 A	2.5	9.5	—	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	—	70	—
	Turn-on time	t _{on}		—	130	—
	Fall time	t _f		—	70	—
	Turn-off time	t _{off}		—	280	—
Total gate charge (gate-source plus gate-drain)	Q _g	V _{DD} ≈ 360 V, V _{GS} = 10 V, I _D = 17 A	—	62	—	nC
Gate-source charge	Q _{gs}		—	40	—	
Gate-drain ("Miller") charge	Q _{gd}		—	22	—	

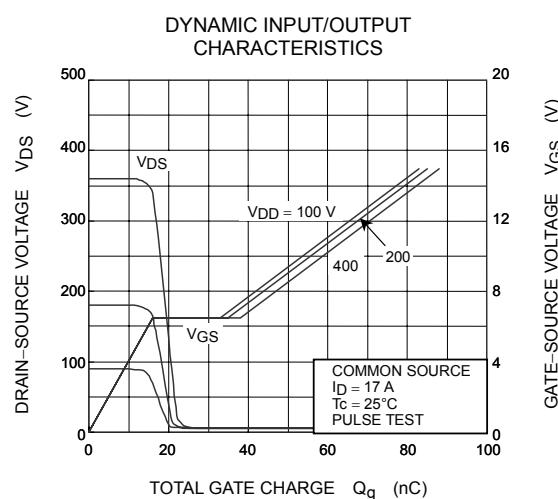
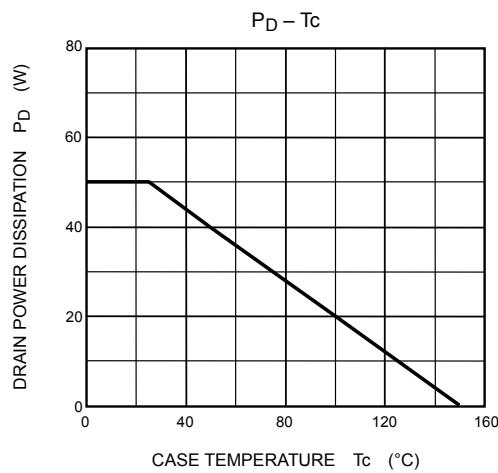
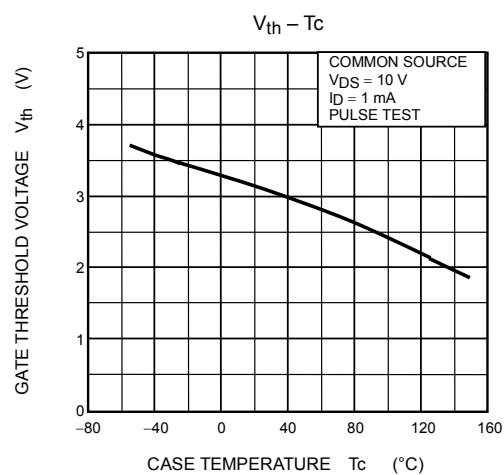
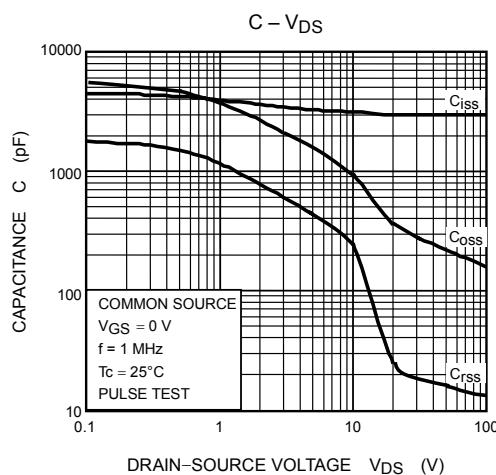
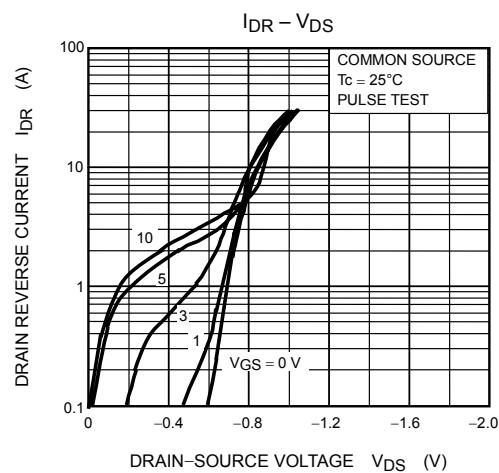
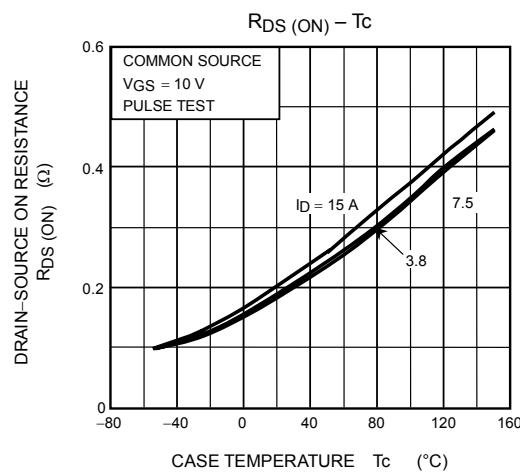
Source-Drain Ratings and Characteristics (Ta = 25°C)

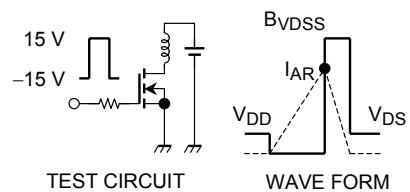
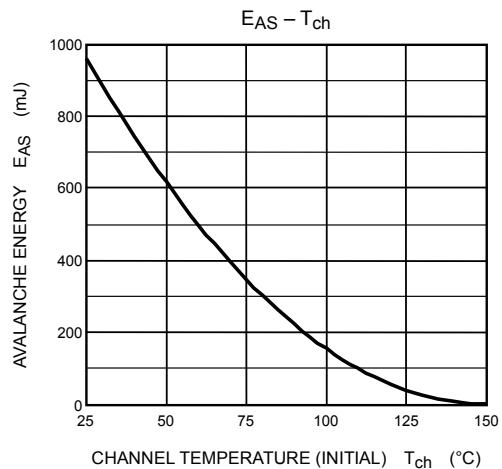
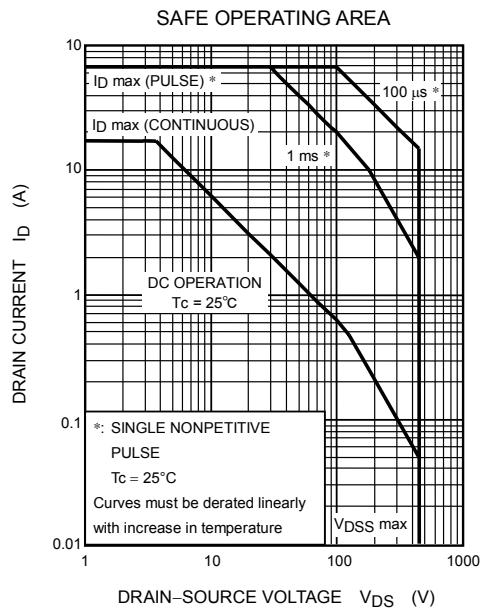
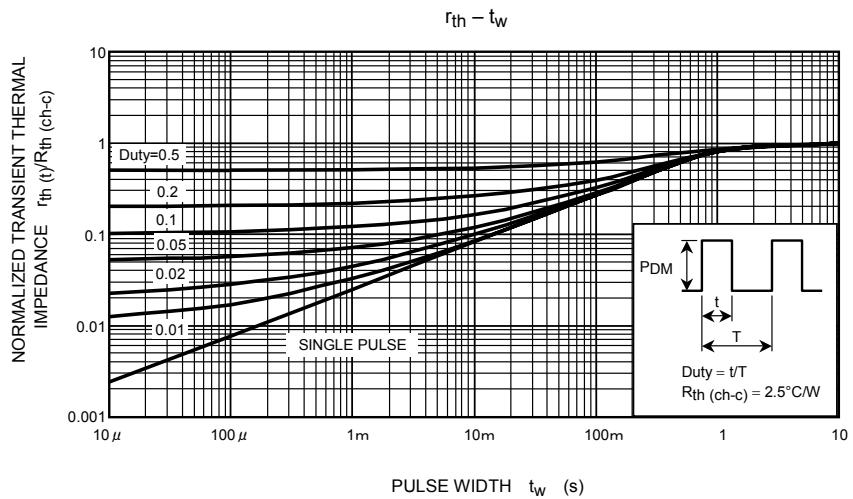
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	—	—	—	17	A
Pulse drain reverse current (Note 1)	I _{DRP}	—	—	—	68	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 17 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse recovery time	t _{rr}	I _{DR} = 17 A, V _{GS} = 0 V dI _{DR} / dt = 100 A / μs	—	1400	—	ns
Reverse recovery charge	Q _{rr}	I _{DR} = 17 A, V _{GS} = 0 V dI _{DR} / dt = 100 A / μs	—	21	—	μC

Marking









$$R_G = 25\ \Omega$$

$$V_{DD} = 90\ \text{V}, L = 5.3\ \text{mH}$$

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

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