

POWER MOSFET 2SK2843

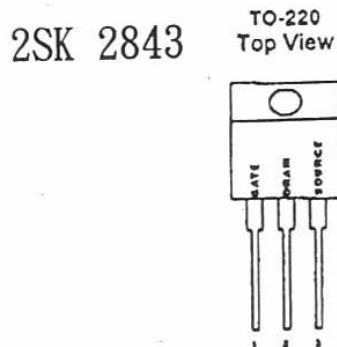
GENERAL DESCRIPTION

This high voltage MOSFET uses an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation modes. The new energy efficient design also offers a drain-to-source diode with a fast recovery time. Designed for high voltage, high speed switching applications in power supplies, converters and PWM motor controls, these devices are particularly well suited for bridge circuits where diode speed and commutating safe operating areas are critical and offer additional and safety margin against unexpected voltage transients.

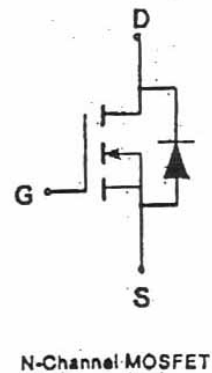
FEATURES

- ◆ Robust High Voltage Termination
- ◆ Avalanche Energy Specified
- ◆ Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- ◆ Diode is Characterized for Use in Bridge Circuits
- ◆ I_{oss} and $V_{GS(on)}$ Specified at Elevated Temperature

PIN CONFIGURATION



SYMBOL



ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current – Continuous	I_D	10	A
– Pulsed	I_{DM}	35	
Gate-to-Source Voltage – Continue	V_{GS}	± 20	V
– Non-repetitive	V_{GSM}	± 30	V
Total Power Dissipation	P_D	201	W
Derate above 25°C		1.61	W/°C
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Single Pulse Drain-to-Source Avalanche Energy – $T_J = 25^\circ\text{C}$ ($V_{DS} = 100\text{V}, V_{GS} = 10\text{V}, I_L = 10\text{A}, L = 8\text{mH}, R_G = 25\Omega$)	E_{AS}	400	mJ
Repetitive Avalanche Energy	E_{AR}	14	
Thermal Resistance – Junction to Case	θ_{JC}	0.62	°C/W
– Junction to Ambient	θ_{JA}	62.5	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	°C

ORDERING INFORMATION

Part Number	Package
2SK 2843	T0-220

ELECTRICAL CHARACTERISTICS

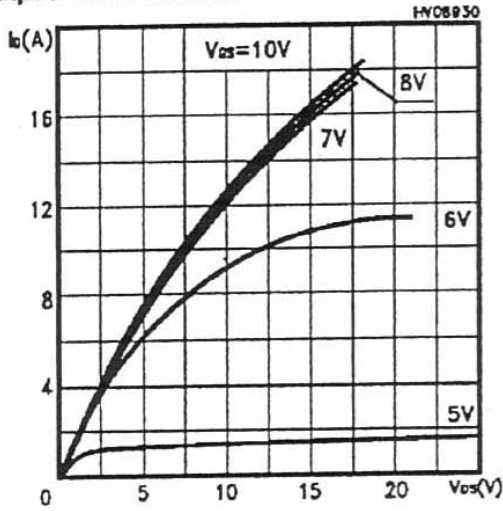
Unless otherwise specified, $T_J = 25^\circ\text{C}$.

		2SK 2843			
Characteristic	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage ($V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$)	$V_{(BR)DS}$	600			V
Drain-Source Leakage Current ($V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$) ($V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$)	I_{DSS}			0.01 0.1	mA
Gate-Source Leakage Current-Forward ($V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$)	I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse ($V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$)	I_{GSSR}			100	nA
Gate Threshold Voltage ($V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$)	$V_{GS(th)}$	2.0	2.8	4.0	V
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ V}, I_D = 5\text{A}$) *	$R_{DS(on)}$			0.75	Ω
Drain-Source On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 10\text{ A}$)	$V_{DS(on)}$			10.0	V
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 5\text{A}$) *	g_{fs}	3.0	9.0		mhos
Input Capacitance	$(V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz})$	C_{iss}	3300	4620	pF
Output Capacitance		C_{oss}	190	270	pF
Reverse Transfer Capacitance		C_{rss}	4.0	10	pF
Turn-On Delay Time	$(V_{GS} = 300\text{ V}, I_D = 10\text{ A}, V_{GS} = 10\text{ V}, R_G = 9.1\Omega)^*$	$t_{d(on)}$	20	40	ns
Rise Time		t_r	28	60	ns
Turn-Off Delay Time		$t_{d(off)}$	58	120	ns
Fall Time		t_f	36	70	ns
Total Gate Charge		$(V_{DS} = 400\text{ V}, I_D = 10\text{ A}, V_{GS} = 10\text{ V})^*$	Q_g	41	60
Gate-Source Charge	Q_{gs}		13		nC
Gate-Drain Charge	Q_{gd}		6.8		nC
Internal Drain Inductance (Measured from the drain lead 0.25" from package to center of die)	L_D		4.5		nH
Internal Drain Inductance (Measured from the source lead 0.25" from package to source bond pad)	L_S		7.5		nH
SOURCE-DRAIN DIODE CHARACTERISTICS					
Forward On-Voltage(1)	$(I_S = 10\text{A}, V_{GS} = 0\text{ V}, d_{sp}/d_t = 100\text{A}/\mu\text{s})$	V_{SD}	0.83	1.0	V
Forward Turn-On Time		t_{on}	**		ns
Reverse Recovery Time		t_r	485		ns

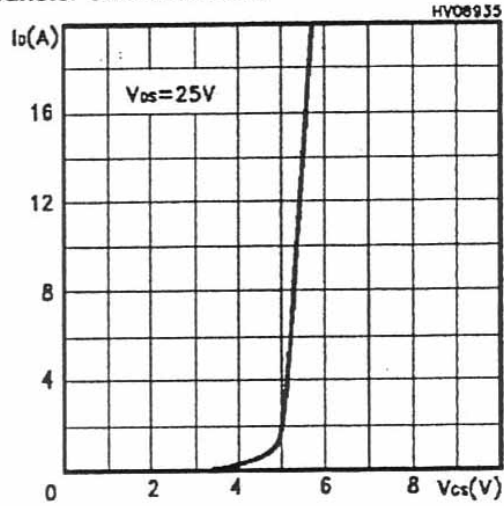
* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
 ** Negligible, Dominated by circuit inductance

TYPICAL ELECTRICAL CHARACTERISTICS

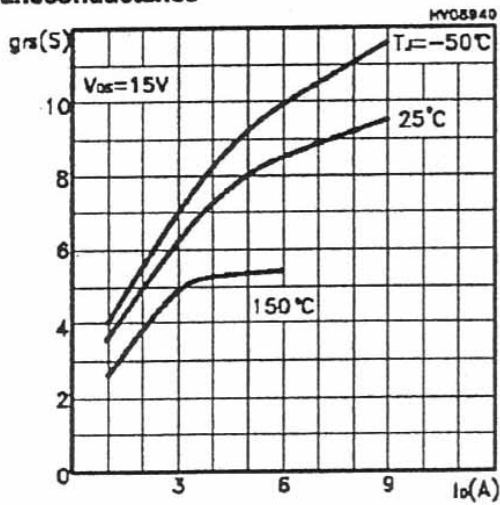
Output Characteristics



Transfer Characteristics



Transconductance



Static Drain-source On Resistance

