

## N-CHANNEL DMOS FET SWITCH VIDEO TRANSISTOR

**B2520/B2515**  
Series

### Description

The B2520 series consists of enhancement-mode MOSFETs designed for high speed low-glitch switching in audio, video, and high-frequency applications. The B2520 is optimized as a  $\pm 7V$  Switch driver. The B2515 is optimized as an Analog Switch with a 20V Source to Body breakdown and low Drain Leakage.

The B2500 series uses Bay Linear ULTRA REL DMOS Process for reliability and robust performance.

These MOSFETs utilize lateral construction to achieve low capacitance and ultra-fast switching speeds. An integrated Zener diode provides ESD protection.

### Features

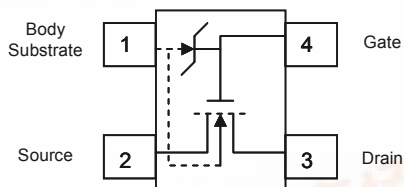
- **High Input to Output Isolation – 120dB typical**
- **Low feed through and feedback transients**
- **Low Inter-electrode Capacitances**
- **25V Drain-to Source breakdown for B2520**

### Application

- **High Frequency Drivers**
- **Video Switches**
- **A to D Converters**

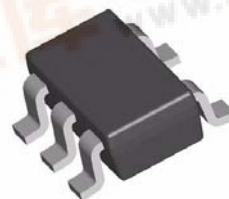
### Pin Connection

**SOT-143 Package**  
**Lead Code Identification**  
(top view)



### Ordering Information

Package	Part No.
SOT-143	B2520K4 -X.X
SOT-143	B2515K4-XX

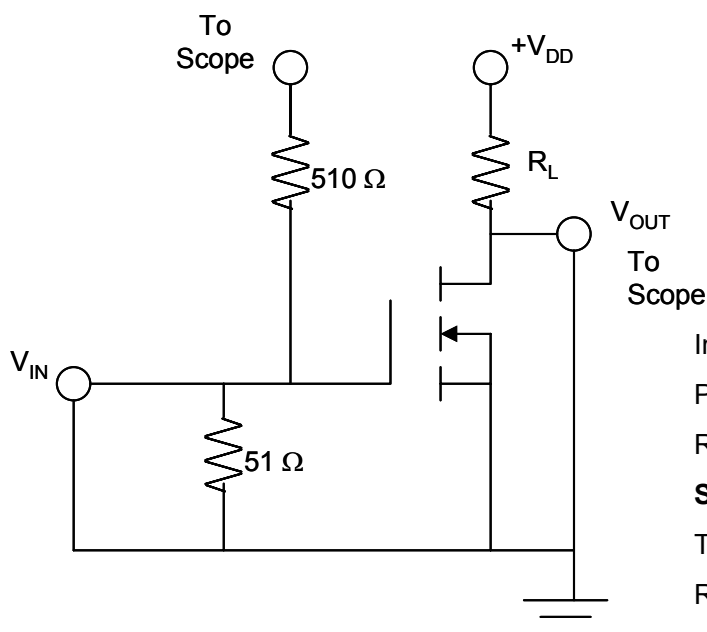


Electrical Specifications ( $T_C = +25^\circ\text{C}$  unless otherwise noted)

	Parameter	Symbol	Test Conditions	B2520			B2515			Units
				Min	Typ	Max	Min	Typ	Max	
STATIC	Drain-Source Breakdown Voltage	$BV_{DS}$ $BV_{DS}$	$I_D=10\ \mu\text{A}$ $V_{GS}=V_{BS}=0$ $I_D=50\ \text{nA}$ $V_{GS}=V_{BS}=0$	25	30					V
	Source-Drain Breakdown Voltage	$BV_{SD}$	$I_S=50\ \text{nA}$ $V_{GD}=V_{BD}=-5$	10	25		15			V
	Drain-Substrate Breakdown Voltage	$BV_{DB}$	$I_D=50\ \text{nA}$ , $V_{GB}=0$ Source Open	15			20			V
	Source-Substrate Breakdown Voltage	$BV_{SB}$	$I_D=10\ \mu\text{A}$ , $V_{GB}=0$ Drain Open	15			20			V
	Drain-Source Leakage	$I_{D(OFF)}$	$V_{GS/BS}=-5$ $V_{DS}=10\text{V}$		1	50				nA
			$V_{DS}=20\text{V}$					1	50	nA
	Source - Drain Leakage	$I_{S(OFF)}$	$V_{GD/BS}=-5$ $V_{DS}=10\text{V}$		1	50				nA
			$V_{DS}=20\text{V}$					1	50	nA
	Gate Leakage	$I_{GBS}$	$V_{DB/SB}=0$ $V_{GS}=20\text{V}$		1	10		1	10	$\mu\text{A}$
	Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=1\ \mu\text{A}$ $V_{SB}=0$	0.5	1.0	2.0	0.1	1.0	2.0	V
	Drain-Source ON Resistance	$r_{DS(ON)}$	$I_D=1\ \text{mA}$ $V_{GS}=5\text{V}$		50	70		50	70	Ohm
			$V_{SB}=0\text{V}$ $V_{GS}=10\text{V}$		30	45		30	45	Ohm

Parameter		Symbol	Test Conditions	B2520			B2515			Units
				Min	Typ	Max	Min	Typ	Max	
DYNAMIC	Common-Source Forward Transconductance	gfS	VDS= 10V ID= 20mA f = 1MHz, VSB=0 Pulsed	10	15		10	15		V
	Gate Node Capacitance	C(gs+gd+gb)	VDS= 10V VGS=VBS= -15V f = 1MHz		2.4	3.5		2.4	3.5	pF
	Drain Node Capacitance	C(gd+db)			1.3	1.5		1.3	1.5	pF
	Source Node Capacitance	C(gs+sb)			3.5	4.0		3.5	4.0	pF
	Reverse Transfer Capacitance	C(dg)			0.3	0.5		0.3	0.5	pF
	Turn On Delay Time	td(on)	V∞= 10V VG(on)= 10V RL= 680 Ω RG= 51Ω CL = 1.5pF		0.7	1.0		0.7	1.0	ns
	Rise Time	tr			0.8	1.0		0.8	1.0	ns
	Turn Off Delay Time	Td(off)			1.5			1.5		ns

## Switching Time Test Circuit



Input Pulse:  $t_d, t_r < 1\text{ ns}$

Pulse width: 100 ns

Rep rate: 1 MHz

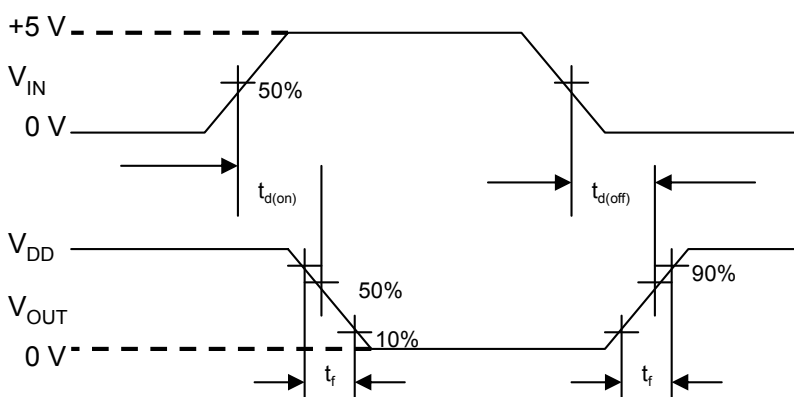
**Sampling Scope**

$T_r < 360\text{ ps}$

$R_{IN} = 1\text{ M}\Omega$

$C_{IN} = 2\text{ pF}$

BW = 500 MHz



**Absolute Maximum Ratings,  $T_c = +25^\circ\text{C}$** 

Parameter	Unit	Absolute Maximum <sup>[1]</sup>
		<b>SOT-143</b>
Drain-Source Voltage	V	+30 / +20
Gate-Source Voltage	V	-15 / +20
Gate-Drain Voltage	V	-25 / +20
Continuous Drain Current	mA	50
Power dissipation $T_c=25$	mW	300
Linear Derating Factor	mW/C	3
Junction Temperature	$^\circ\text{C}$	-55 to +125
Storage Temperature	$^\circ\text{C}$	-55 to +125

## Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device
2.  $T_c = +25^\circ\text{C}$ , where  $T_c$  is defined to be the temperature at the package pins where contact is made to the circuit board.

**ESD WARNING: Handling Precautions Should Be Taken To Avoid Static Discharge.**

**Advance Information-** These data sheets contain descriptions of products that are in development. The specifications are based on the engineering calculations, computer simulations and/ or initial prototype evaluation.

**Preliminary Information-** These data sheets contain minimum and maximum specifications that are based on the initial device characterizations. These limits are subject to change upon the completion of the full characterization over the specified temperature and supply voltage ranges.

The application circuit examples are only to explain the representative applications of the devices and are not intended to guarantee any circuit design or permit any industrial property right to other rights to execute. Bay Linear takes no responsibility for any problems related to any industrial property right resulting from the use of the contents shown in the data book. Typical parameters can and do vary in different applications. Customer's technical experts must validate all operating parameters including "Typical" for each customer application.

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