

Depletion-Mode Power MOSFET

General Features

- Depletion Mode (Normally On)
- Proprietary Advanced Planar Technology
- Rugged Polysilicon Gate Cell Structure
- ➤ RoHS Compliant
- Halogen-free Available

$\mathbf{BV}_{\mathbf{DSX}}$	R _{DS(ON) (Max.)}	I_D
550V	70Ω	0.09A

SOT-89





Applications

- > Transient Protect
- Start-up
- Converters
- Normally On Switches
- ➤ LED Drive Circuits
- Power Supplies
- Current Source
- Voltage Source

Ordering Information

Part Number	Package	Marking	Remark
DMX5530E	SOT-89	5530	Halogen Free

Absolute Maximum Ratings

T_A=25°C unless otherwise specified

Symbol	Parameter	DMX5530E	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	550	V
V_{DGX}	Drain-to-Gate Voltage ^[1]	550	V
I_D	Continuous Drain Current	0.09	Δ
I_{DM}	Pulsed Drain Current ^[2]	0.36	A
P_{D}	Power Dissipation	1	W
V_{GS}	Gate-to-Source Voltage	±20	V
T_{L}	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	J
T_J and T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	DMX5530E	Unit	
$R_{ heta JC}$	Thermal Resistance, Junction-to-Case	125	°C/W	



Electrical Characteristics

OFF Characteristics

 $T_A = 25$ °C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	550			V	V_{GS} =-10V, I_D =250 μ A
I _{D(OFF)}	Drain-to-Source Leakage Current			2	μA	$V_{DS} = 550 V$, $V_{GS} = -10 V$
Ţ	Cata to Course Leakage Current			10	μΑ	$V_{GS} = +20V, V_{DS} = 0V$
I_{GSS}	Gate-to-Source Leakage Current			-10		V_{GS} =-20V, V_{DS} =0V

ON Characteristics

T_A =25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)} \\$	Static Drain-to-Source On-Resistance			70	Ω	$V_{GS}=0V, I_D=50mA^{[3]}$
$V_{\text{GS(OFF)}}$	Gate-to-Source Cut-off Voltage	-1.5		-3.8	V	$V_{DS}=3V$, $I_D=8\mu A$
gfs	Forward Transconductance		60.3		mS	V _{DS} =10V, I _D =50mA ^[3]

Dynamic Characteristics

Essentially independent of operating temperature

Dynamic Characteristics Essen					Essent	rany mue _l	bendent of operating temperature
5	Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
	C_{iss}	Input Capacitance		58.5			$\begin{array}{c} V_{GS}\text{=-}10V \\ V_{DS}\text{=-}25V \\ \text{f=}1.0\text{MHZ} \end{array}$
	C_{oss}	Output Capacitance		13.8		pF	
	C_{rss}	Reverse Transfer Capacitance		3.9			
	Q_{g}	Total Gate Charge		215.4		nC	$V_{GS}\text{=-}10V\text{-}0V$ $V_{DD}\text{=-}25V$ $I_{D}\text{=-}50\text{mA}$
	$Q_{gs} \\$	Gate-to-Source Charge		35.8			
	\mathbf{Q}_{gd}	Gate-to-Drain (Miller) Charge		112			

Resistive Switching Characteristics

Essentially independent of operating temperature

2100100110 21110011118 011011000						sendent of operating temperature
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time		5.9		ns	$V_{GS}\text{=-}10V\text{$\sim$}0V$ $V_{DD}\text{=-}25V$ $I_{D}\text{=-}50\text{mA}$ $R_{G}\text{=-}10~\Omega$
t_{rise}	Rise Time		8.8			
$t_{d(off)}$	Turn-off Delay Time		16.5			
t_{fall}	Fall Time		305			

Source-Drain Diode Characteristics

T_A=25°C unless otherwise specified

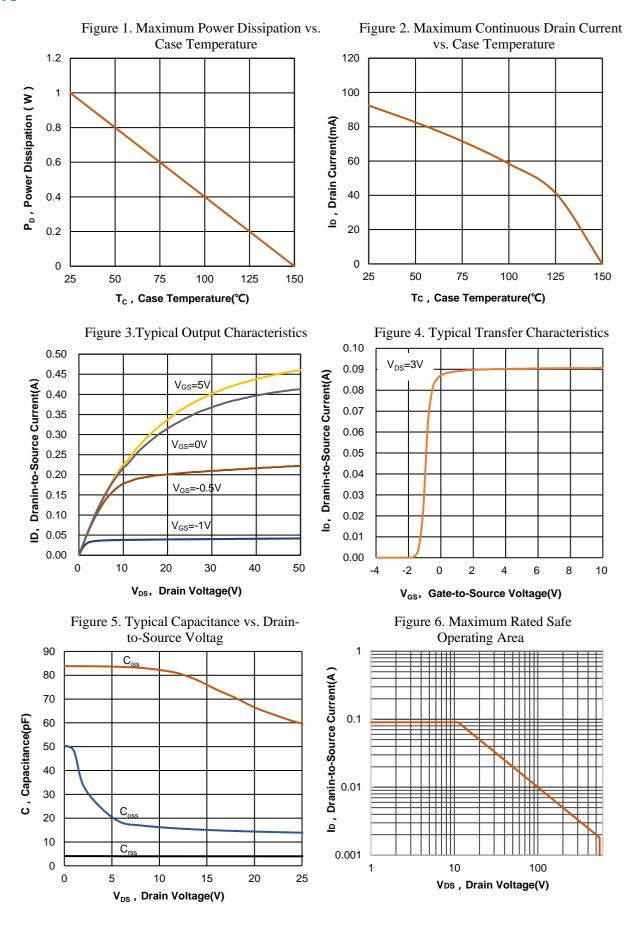
Symbol	Parameter	Min	Тур.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage		0.8	1.5	V	$I_{SD}=50\text{mA}^{[3]}, V_{GS}=-10\text{V}$

NOTE:

- [1] $T_J = +25^{\circ}C$ to $+150^{\circ}C$
- [2] Repetitive rating, pulse width limited by maximum junction temperature.
- [3] Pulse width \(380\mu s; \) duty cycle \(\le 2\% \).



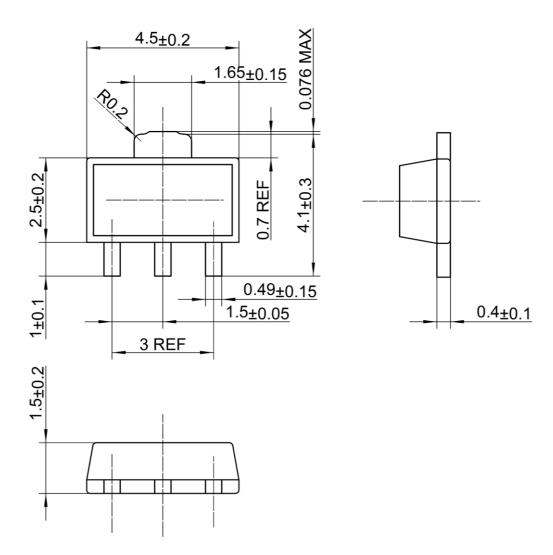
Typical Characteristics





Package Dimensions

SOT-89





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