



20V N+P Dual Channel MOSFETs

General Description

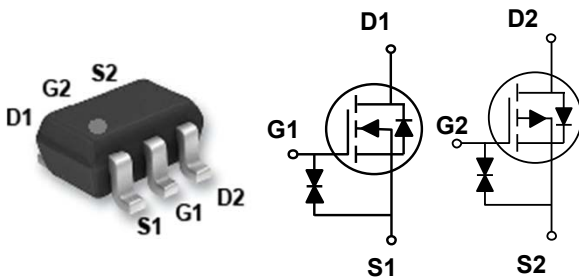
These N+P dual Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications

BV _{DSS}	R _{DS(ON)}	I _D
20 V	350 mΩ	0.72 A
-20 V	600 mΩ	-0.53 A

Features

- ESD Protection
- Green Device Available
- Reliable and Rugged

SOT-363 Pin Configuration



Applications

- Power Supply Converter Circuits
- Load / Power Switches

Absolute Maximum Ratings T_J=25°C unless otherwise noted

Symbol	Parameter	Rating		Units
V _{DS}	Drain-Source Voltage	20	-20	V
V _{GS}	Gate-Source Voltage	±8	±8	V
I _D	Drain Current - Continuous (T _A =25°C)	0.72	-0.53	A
	Drain Current - Continuous (T _A =70°C)	0.57	-0.42	A
I _{DM}	Drain Current - Pulsed (NOTE 1)	0.9	-0.9	A
P _D	Power Dissipation (T _A =25°C)	250		mW
T _J	Operating Junction Temperature Range	-55 to 150		°C
T _{STG}	Storage Temperature Range	-55 to 150		°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	---	500	°C/W



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N Channel Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	---	±10	uA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =0.2A	---	---	350	mΩ
		V _{GS} =2.5V, I _D =0.2A	---	---	460	
		V _{GS} =1.8V, I _D =0.1A	---	---	900	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.48	---	1.0	V

Dynamic and switching Characteristics (NOTE 4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =0.72A	---	1	---	nC
Q _{gs}	Gate-Source Charge		---	0.3	---	
Q _{gd}	Gate-Drain Charge		---	0.1	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =10V, V _{GS} =4.5V, R _{GEN} =6Ω, I _D =0.72A	---	1.2	---	nS
T _r	Rise Time		---	24.5	---	
T _{d(off)}	Turn-Off Delay Time		---	13.6	---	
T _f	Fall Time		---	14.6	---	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	40	---	pF
C _{oss}	Output Capacitance		---	17	---	
C _{rss}	Reverse Transfer Capacitance		---	9.9	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =0.3A	---	---	1.1	V



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Characteristics Curves

FIG. 1- Gate Threshold Voltage

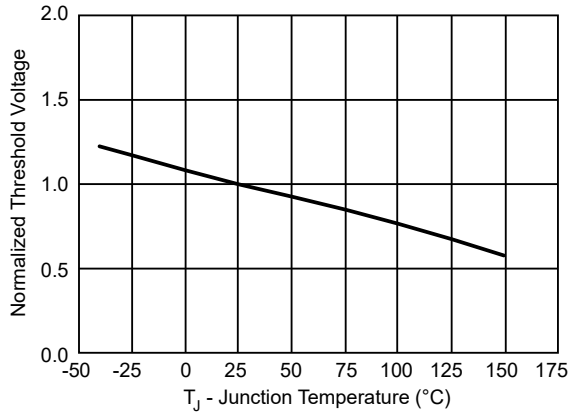


FIG. 2- Drain-Source On-Resistance

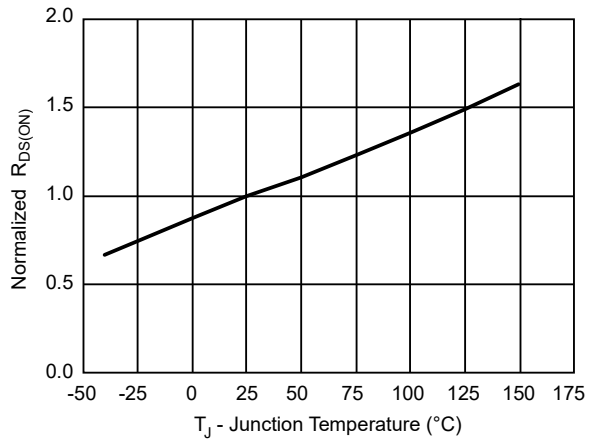


FIG. 3- Source-Drain Diode Forward

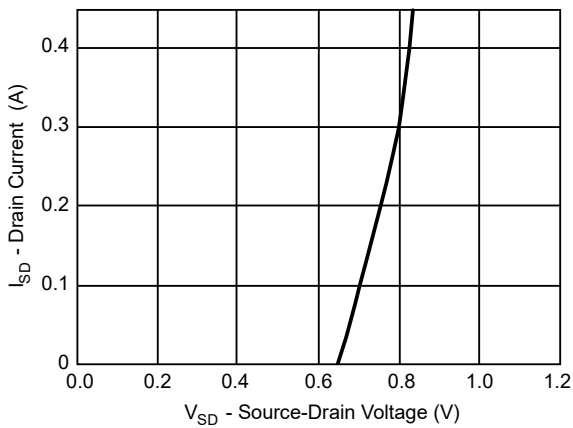


FIG. 4- Power Dissipation

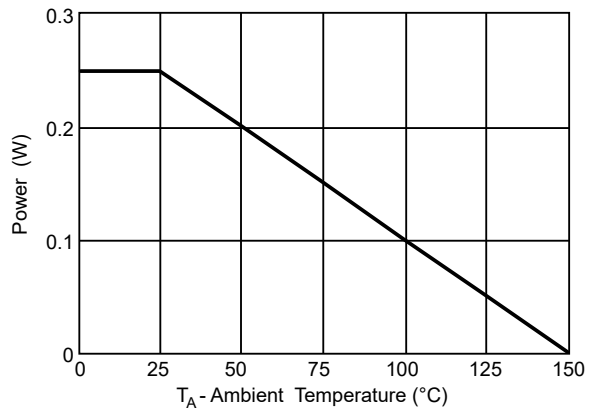
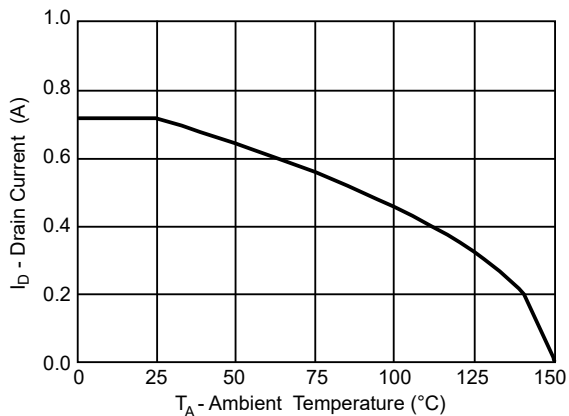


FIG. 5- Drain Current





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P Channel Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V , I _D = -250uA	-20	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = -16V , V _{GS} = 0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±8V , V _{DS} = 0V	---	---	±10	A

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = -4.5V , I _D = -0.2A	---	---	600	mΩ
		V _{GS} = -2.5V , I _D = -0.2A	---	---	850	
		V _{GS} = -1.8V , I _D = -0.1A	---	---	1200	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-0.48	---	-1.0	V

Dynamic and switching Characteristics (NOTE 4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} = -10V , V _{GS} = -4.5V , I _D = -0.43A	---	1	---	nC
Q _{gs}	Gate-Source Charge		---	0.17	---	
Q _{gd}	Gate-Drain Charge		---	0.18	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} = -10V , V _{GS} = -4.5V , R _{GEN} =6Ω , I _D = -0.43A	---	0.4	---	nS
T _r	Rise Time		---	0.03	---	
T _{d(off)}	Turn-Off Delay Time		---	0.04	---	
T _f	Fall Time		---	1.1	---	
C _{iss}	Input Capacitance	V _{DS} = -10V , V _{GS} = 0V , F= 1MHz	---	57.8	---	pF
C _{oss}	Output Capacitance		---	5.6	---	
C _{rss}	Reverse Transfer Capacitance		---	4.3	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S = -0.22A	---	---	-1.1	V

NOTES :

1. Max. current is limited by bonding wire.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.
4. Guaranteed by design, not subject to production testing.



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Characteristics Curves

FIG. 6- On-Resistance vs. V_{GS}

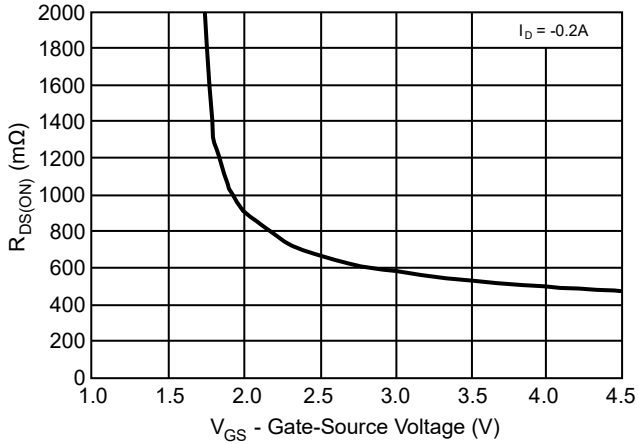


FIG. 7- Gate Threshold Voltage

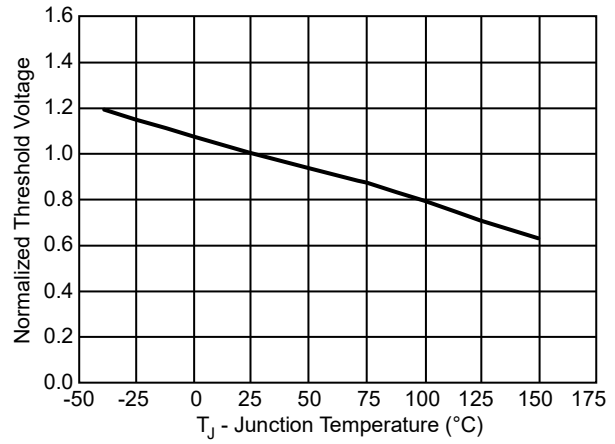


FIG. 8- Drain-Source On-Resistance

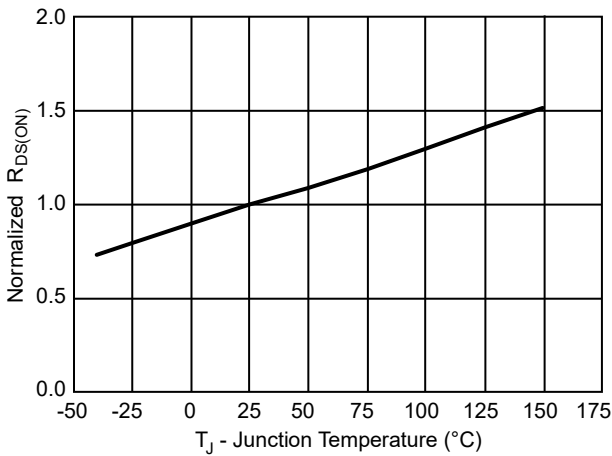
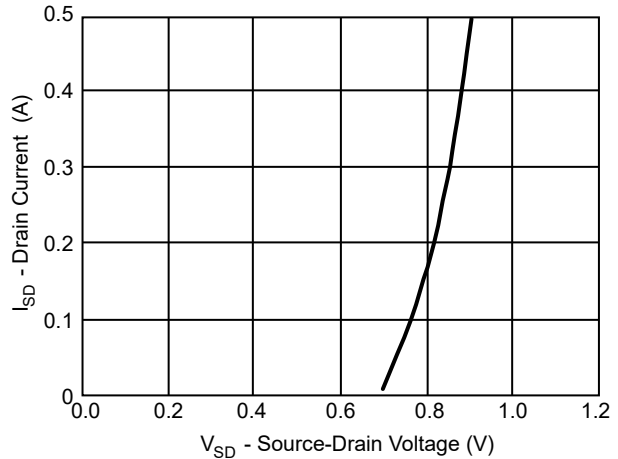
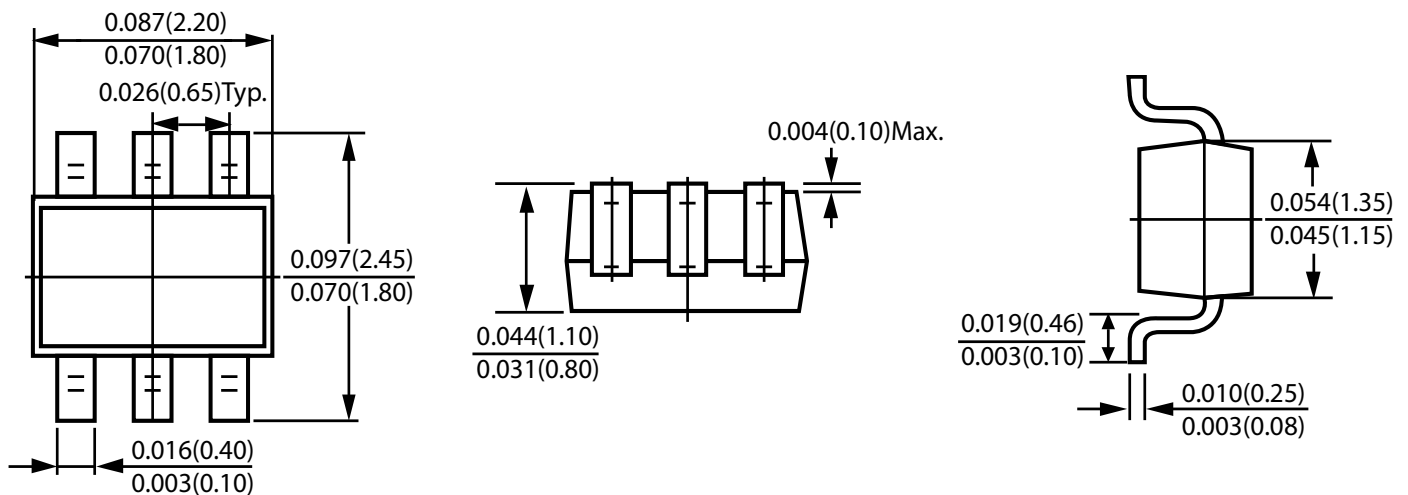


FIG. 9- Source-Drain Diode Forward



Package Outline Dimensions



SOT-363

Dimensions in inches and (millimeters)



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