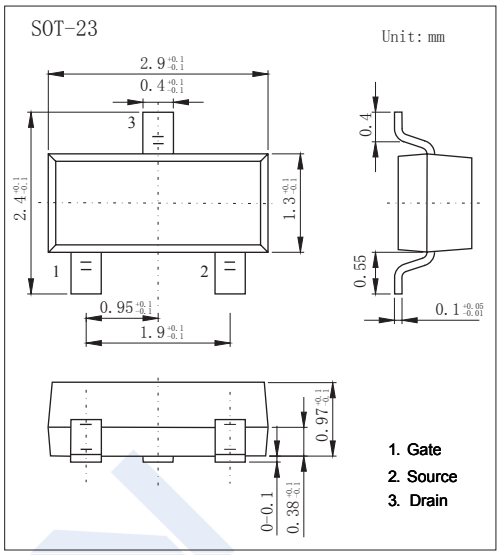
Silicon N-Channel Power MOSFET (Depletion Mode)

F501

■ Features

- $V_{DS\ (V)}$ = 500V
- I_D = 0.03 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 850 Ω (V_{GS} = 10V)
- $R_{DS(ON)}$ < 750 Ω (V_{GS} = 0V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	500	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	TA=25℃	I_D	0.03	A
	TA=70℃		0.024	
Pulsed Drain Current		I_{DM}	0.12	
Power Dissipation	TA=25℃	P_D	0.5	W
Peak Diode Recovery dv/dt		dv/dt	5	V/ns
Thermal Resistance.Junction- to-Ambient		$R_{\theta JA}$	250	℃/W
MaximumTemperature for Soldering		T_L	300	℃
Junction Temperature		T_J	150	
Storage Temperature Range		T_{stg}	-55 to 150	

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSX}	I_D=250μA, V_{GS}=-5V	500			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=25V, V_{GS}=0V	1			mA
Gate-Body Leakage Current	I_{GSS}	VDS=0V, VGS=±20V			±100	nA
Off-state Drain to Source Current	$I_{D(off)}$	V_{DS} =500V, V_{GS}= -5V			0.1	μA
		V_{DS} =400V, V_{GS}= -5V,Ta=125°C			10	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=3V , I_D=8μA	-2.7		-1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=0V, I_D=3mA			750	Ω
		V_{GS}=10V, I_D=16mA			850	
Forward Transconductance	g_{FS}	V_{DS}=50V, I_D=0.01A	0.008			S
Input Capacitance	C_{iss}	V_{GS}=-5V, V_{DS}=25V, f=1MHz		50		pF
Output Capacitance	C_{oss}			4.53		
Reverse Transfer Capacitance	C_{rss}			1.08		
Total Gate Charge	Q_g	V_{GS}=-5V to 5V, V_{DS}=400V, I_D=0.01A		1.14		nC
Gate Source Charge	Q_{gs}			0.5		
Gate Drain Charge	Q_{gd}			0.37		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-5…7V, V_{DS}=300V,I_D =0.01A, R_{GEN}=6Ω		9.9		ns
Turn-On Rise Time	t_r			55.8		
Turn-Off DelayTime	$t_{d(off)}$			56.4		
Turn-Off Fall Time	t_f			136		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 0.01A, dI/dt= 100A/us,V_R=300V		243		
Body Diode Reverse Recovery Charge	Q_{rr}			636		nC
Maximum Body-Diode Continuous Current	I_S	Ta=25°C			0.025	A
Maximum Pulsed Current	I_{SM}				0.1	
Diode Forward Voltage	V_{SD}	I_F=16mA,V_{GS}=-5V			1.2	V

■ Marking

Marking	F501

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■ Typical Characterisitics

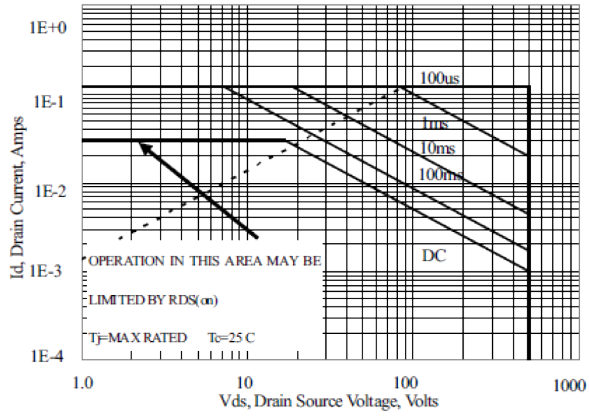

Figure 1 Maximum Forward Bias Safe Operating Area

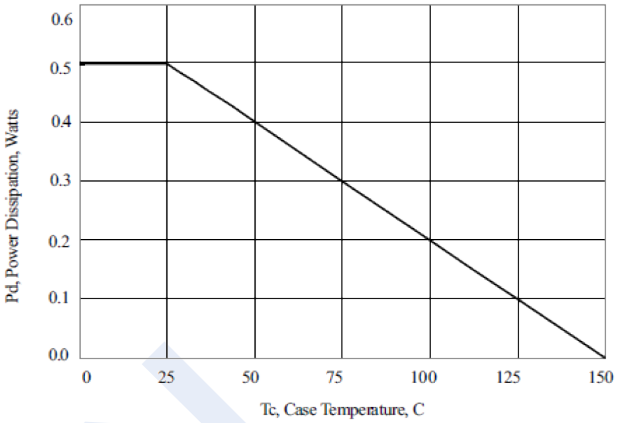

Figure 2 Maximum Power Dissipation vs Case Temperature

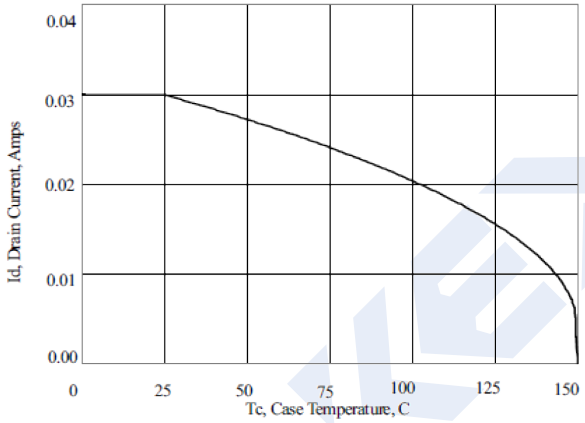

Figure 3 Maximum Continuous Drain Current vs Case Temperature

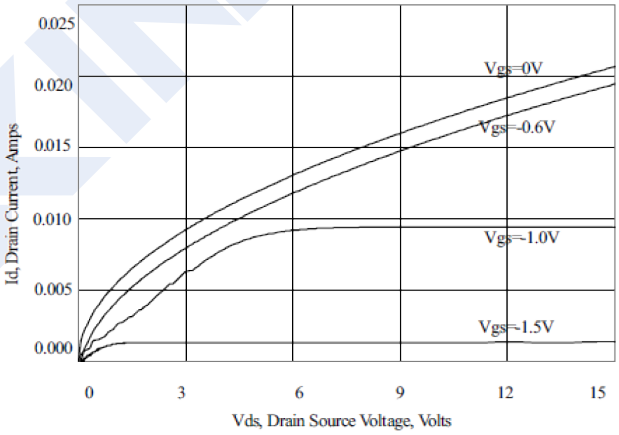

Figure 4 Typical Output Characteristics

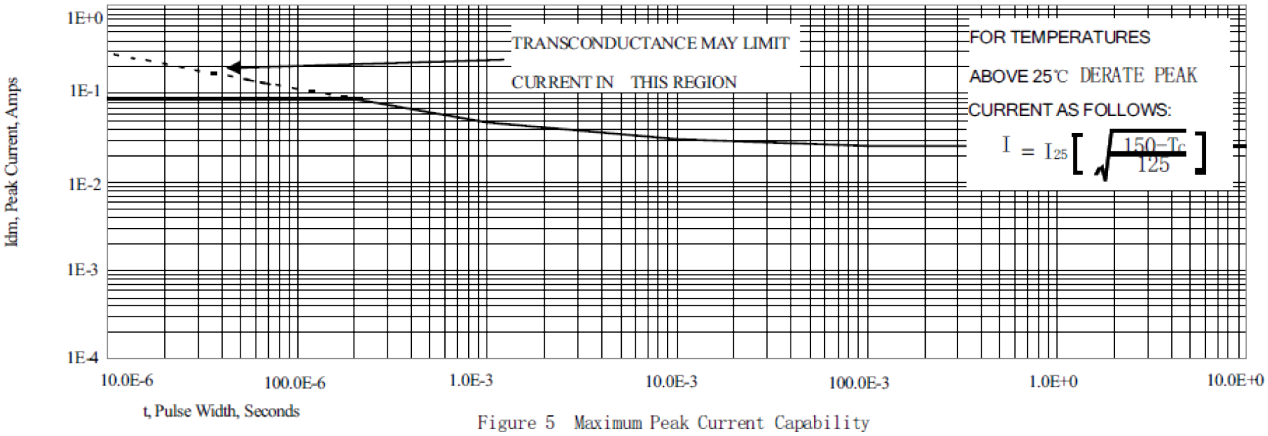

Figure 5 Maximum Peak Current Capability

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■ Typical Characterisitics

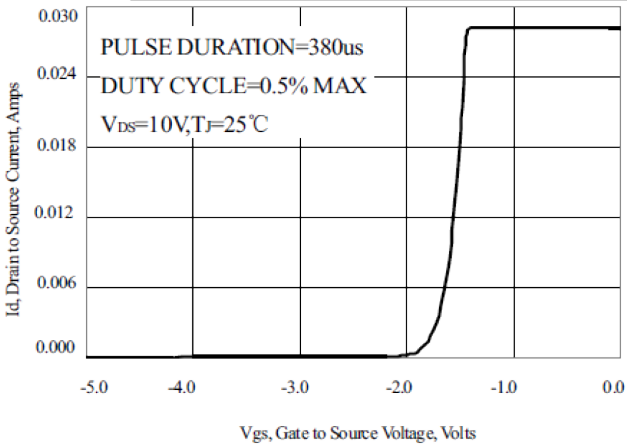

Figure 6 Typical Transfer Characteristics

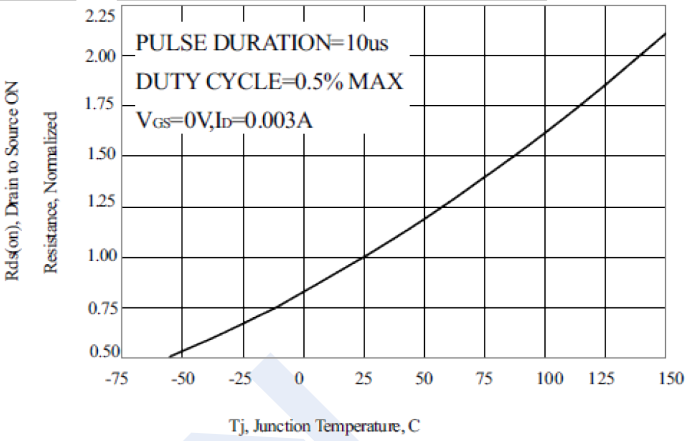

Figure 7 Typical Drain to Source ON Resistance vs Junction Temperature

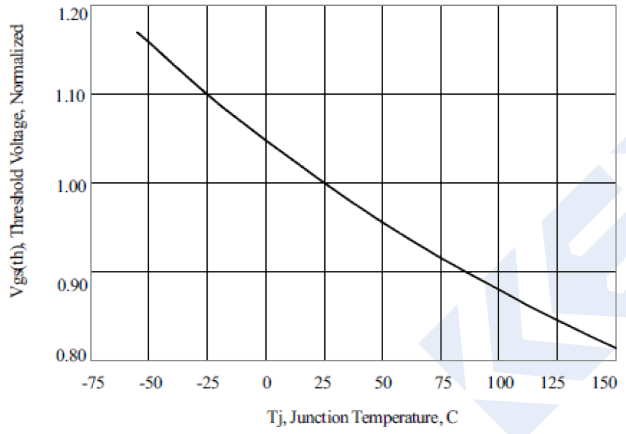

Figure 8 Typical Threshold Voltage vs Junction Temperature

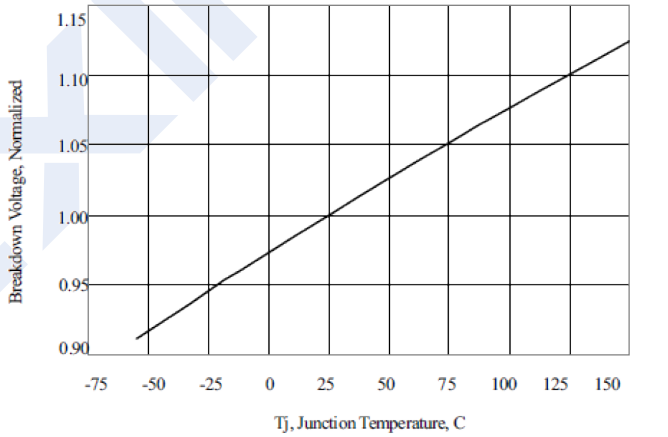

Figure 9 Typical Breakdown Voltage vs Junction Temperature

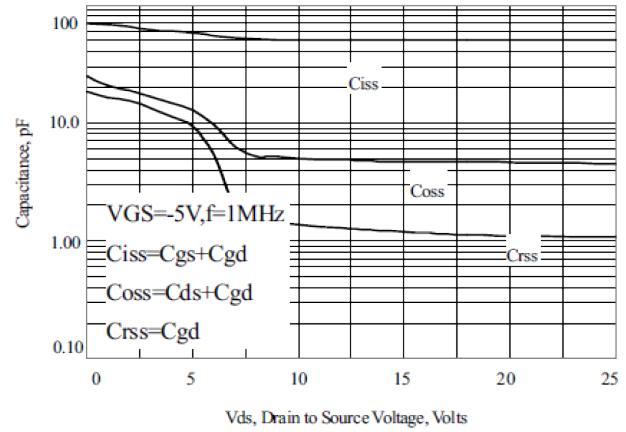

Figure 10 Typical Capacitance vs Drain to Source Voltage

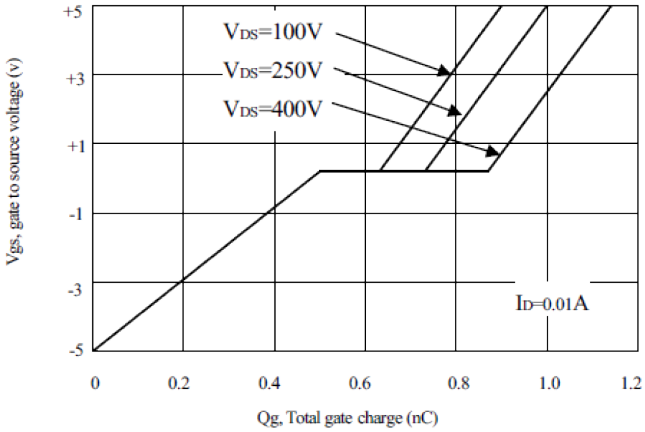

Figure 11 Typical Gate Charge vs Gate to Source Voltage

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■ Typical Characterisitics

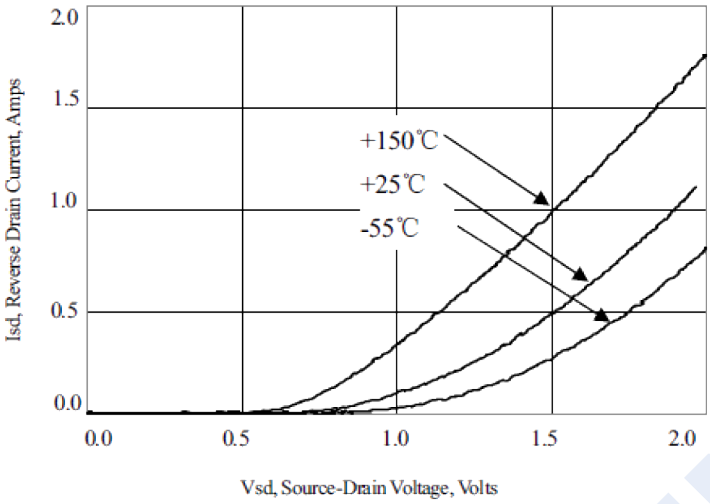

Figure 12 Typical Body Diode Transfer Characteristics