

40V N+P-Channel Enhancement Mode MOSFET

N-channel

 $V_{DS}(V)=40V$
 $I_D=6A$
 $R_{DS(ON)} < 31m\Omega (V_{GS}=10V)$
 $R_{DS(ON)} < 45m\Omega (V_{GS}=4.5V)$

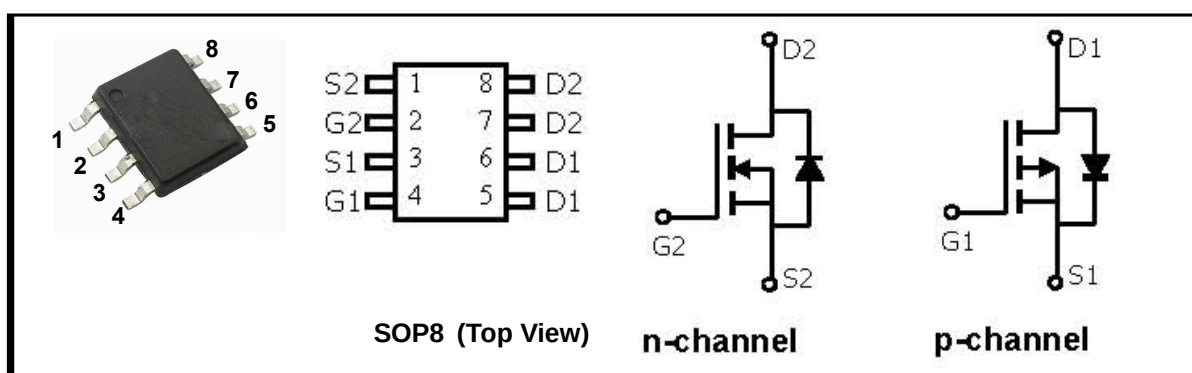
P-channel

 $V_{DS}(V)=-40V$
 $I_D=-5A$
 $R_{DS(ON)} < 45m\Omega (V_{GS}=-10V)$
 $R_{DS(ON)} < 63m\Omega (V_{GS}=-4.5V)$

Features

Advanced trench process technology

High Density Cell Design For Ultra Low On-Resistance



Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Rating		Unit
			N-channel	P-channel	
Drain-Source Voltage		V_{DSS}	40	-40	V
Gate-Source Voltage		V_{GSS}	± 20		V
Continuous Drain Current	$T_A=25^\circ C$	I_D	6	-5	A
	$T_A=70^\circ C$	I_D	5	-4	A
Pulsed Drain Current		I_{DM}	20	-20	A
Power Dissipation	$T_A=25^\circ C$	P_D	2	2	W
	$T_A=70^\circ C$	P_D	1.28	1.28	W
Maximum Junction-to-Ambient	$t \leq 10s$	$R_{\theta JA}$	62.5	62.5	$^\circ C/W$
	Steady-State	$R_{\theta JA}$	110	110	$^\circ C/W$
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	50	50	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150		$^\circ C$

N-CHANNEL Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	40	44		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V$ $V_{GS}=0V$			1.0	μA
		$V_{DS}=40V$ $V_{GS}=0V$ $T_J=55^\circ C$			5.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1	1.6	3	V
On state drain current	$I_{D(on)}$	$V_{DS}=10V$ $V_{GS}=5.0V$	20			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=6A$		17.5	31	m Ω
		$V_{GS}=4.5V$ $I_D=5.0A$		22.8	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5.0V$ $I_D=6.0A$		14		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$		0.73	1.0	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		1200		pF
Output Capacitance	C_{oss}			310		pF
Reverse Transfer Capacitance	C_{rss}			65		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		9.5		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=6A$		8.3		nC
Total Gate Charge(4.5V)				4.2		nC
Gate-Source Charge	Q_{gs}			1.3		nC
Gate-Drain Charge	Q_{gd}			2.3		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=20V$ $V_{GS}=10V$ $R_L=3.3\Omega$ $R_{GEN}=3\Omega$		4.2		ns
Turn-On Rise Time	t_r			3.3		ns
Turn-Off Delay Time	$t_{d(off)}$			15.6		ns
Turn-Off Fall Time	t_f			3		ns

N-CHANNEL Electrical Characteristic Curve

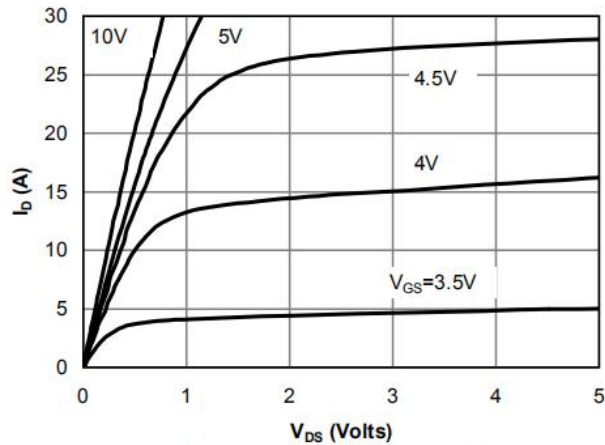


Fig 1: On-Region Characteristics

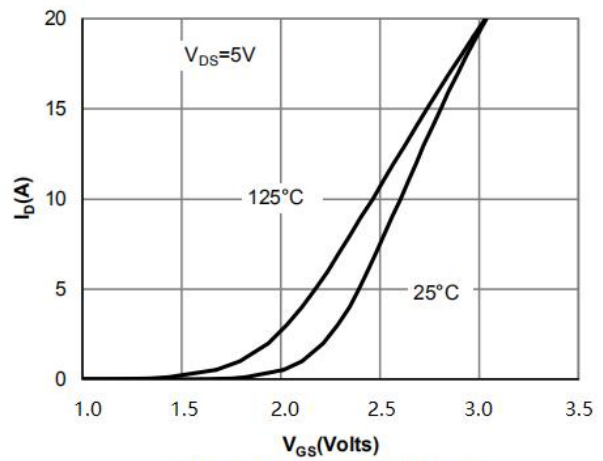


Figure 2: Transfer Characteristics

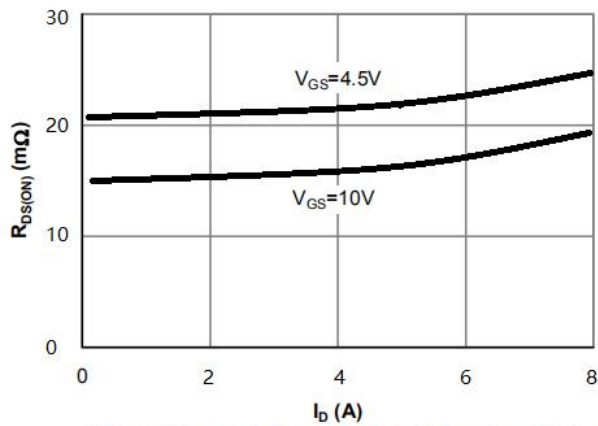


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

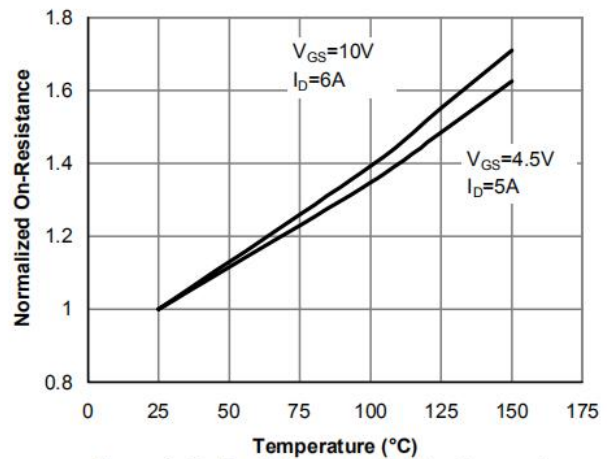


Figure 4: On-Resistance vs. Junction Temperature

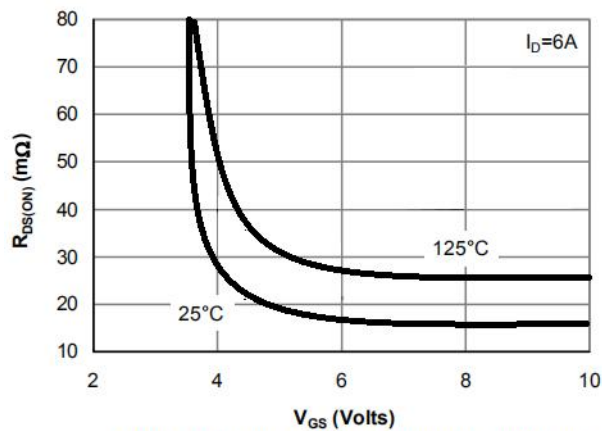


Figure 5: On-Resistance vs. Gate-Source Voltage

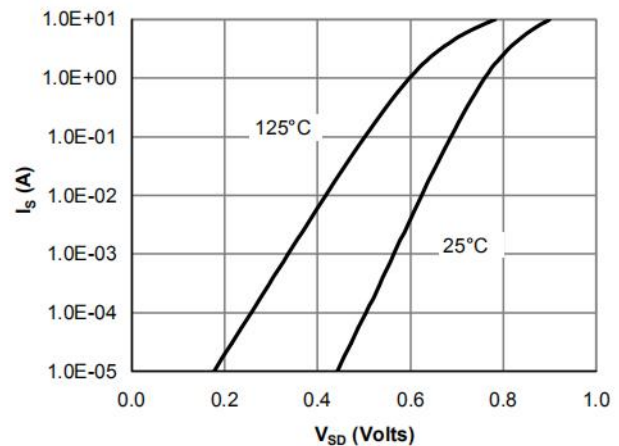


Figure 6: Body-Diode Characteristics

N-CHANNEL Electrical Characteristic Curve

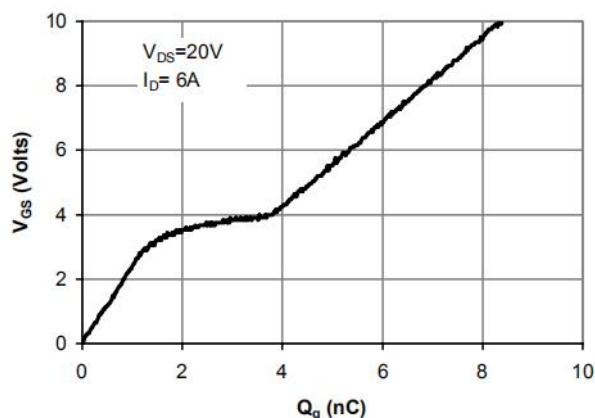


Figure 7: Gate-Charge Characteristics

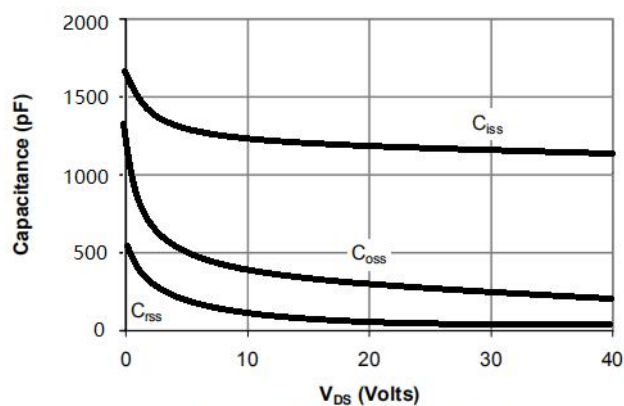


Figure 8: Capacitance Characteristics

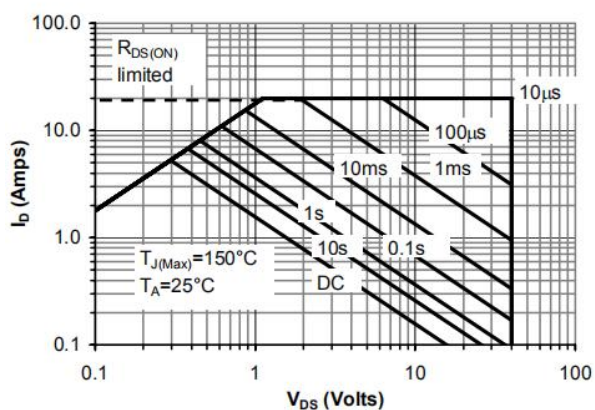


Figure 9: Maximum Forward Biased Safe Operating Area

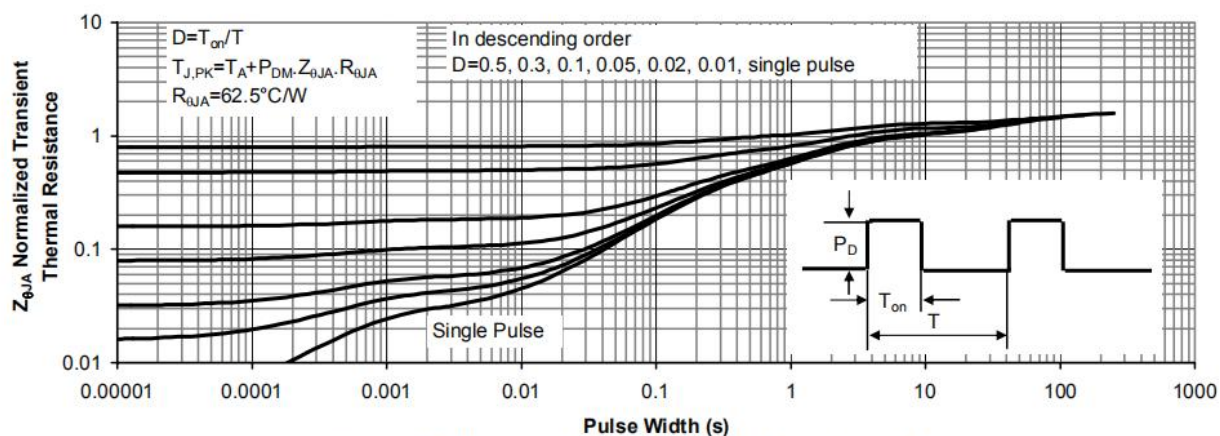


Figure 10: Normalized Maximum Transient Thermal Impedance

N-CHANNEL Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-40	-46		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V$ $V_{GS}=0V$			-1.0	μA
		$V_{DS}=-40V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.6	-3.0	V
On state drain current	$I_{D(on)}$	$V_{DS}=-5V$ $V_{GS}=-10V$	6			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-5.0A$		38	45	m Ω
		$V_{GS}=-4.5V$ $I_D=-2.0A$		49	63	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5.0V$ $I_D=-4.8A$		13		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$		-0.76	-1.0	V
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		710		pF
Output Capacitance	C_{oss}			61		pF
Reverse Transfer Capacitance	C_{rss}			14		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		2.1		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=-10V$ $V_{DS}=-20V$ $I_D=-5.0A$		13.6		nC
Total Gate Charge(4.5V)				6.8		nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			3.9		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-20V$ $V_{GS}=-10V$ $R_L=4\Omega$ $R_{GEN}=3\Omega$		7.5		ns
Turn-On Rise Time	t_r			6.7		ns
Turn-Off Delay Time	$t_{d(off)}$			26		ns
Turn-Off Fall Time	t_f			11.2		ns

N-CHANNEL Electrical Characteristic Curve

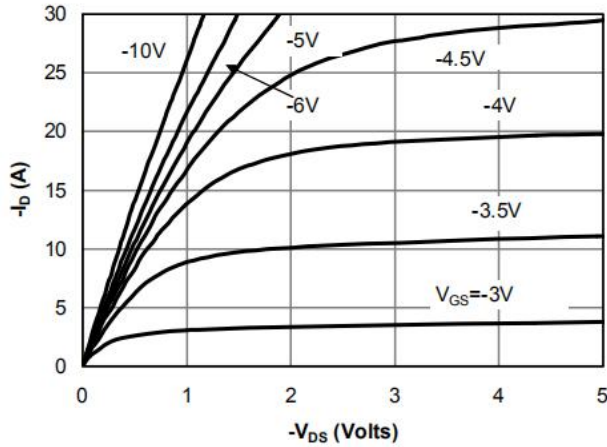


Fig 1: On-Region Characteristics

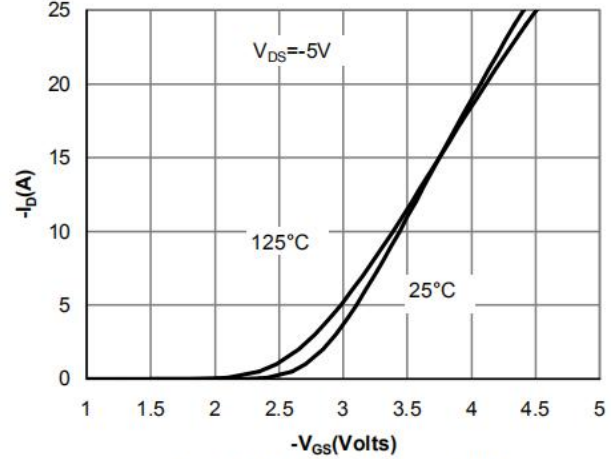


Figure 2: Transfer Characteristics

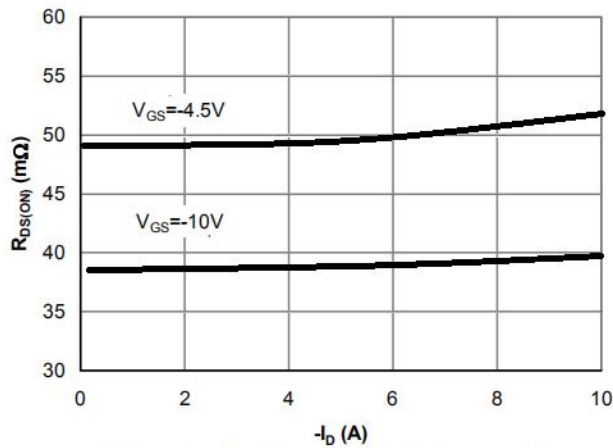


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

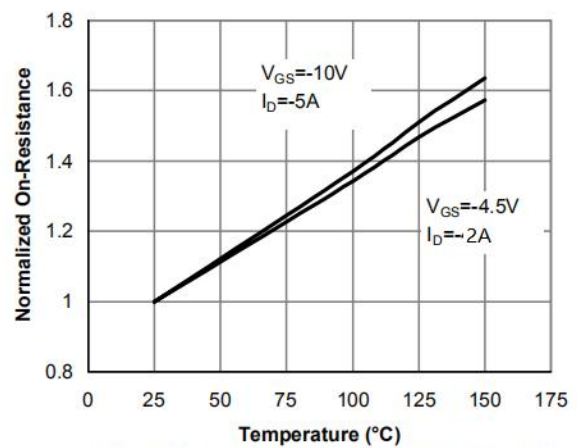


Figure 4: On-Resistance vs. Junction Temperature

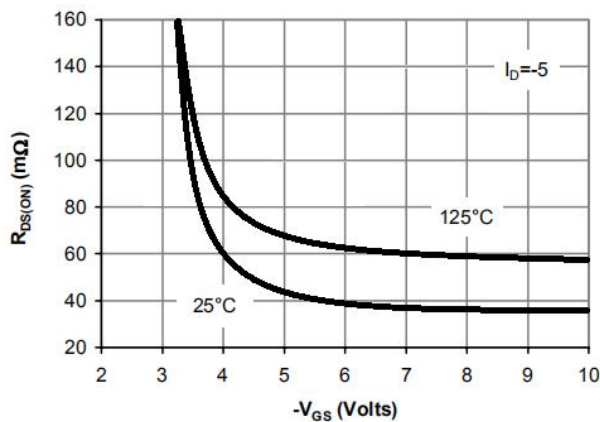


Figure 5: On-Resistance vs. Gate-Source Voltage

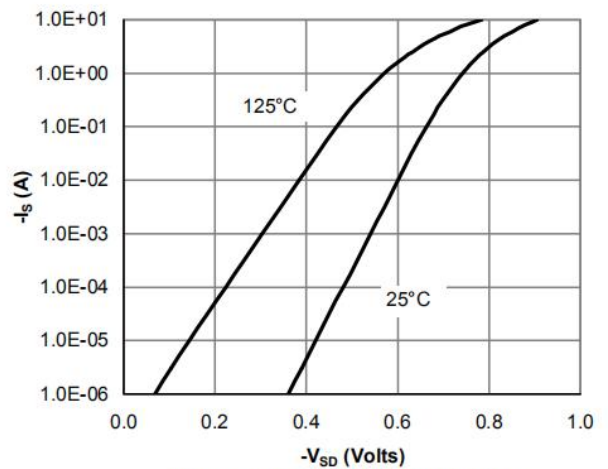


Figure 6: Body-Diode Characteristics

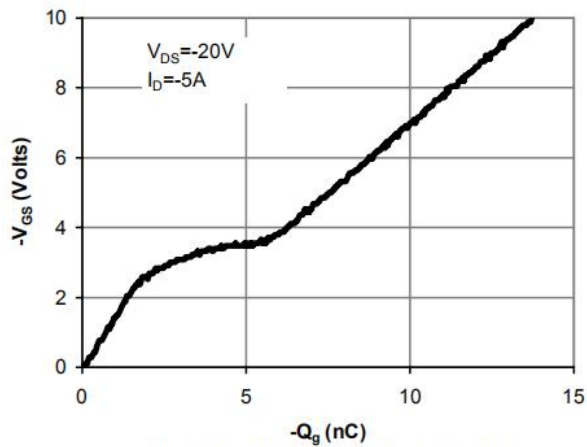


Figure 7: Gate-Charge Characteristics

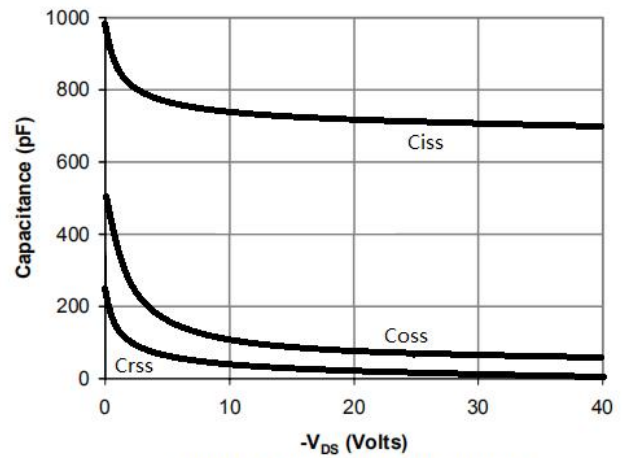


Figure 8: Capacitance Characteristics

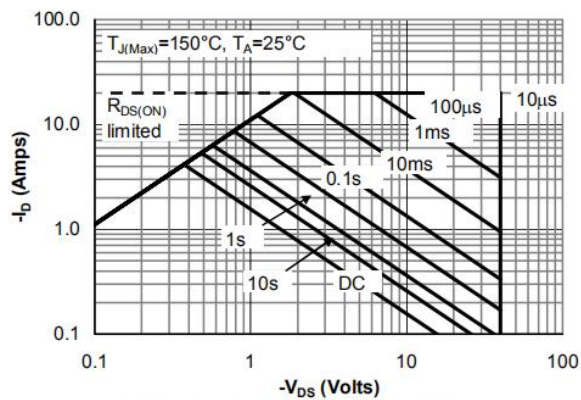


Figure 9: Maximum Forward Biased Safe Operating Area

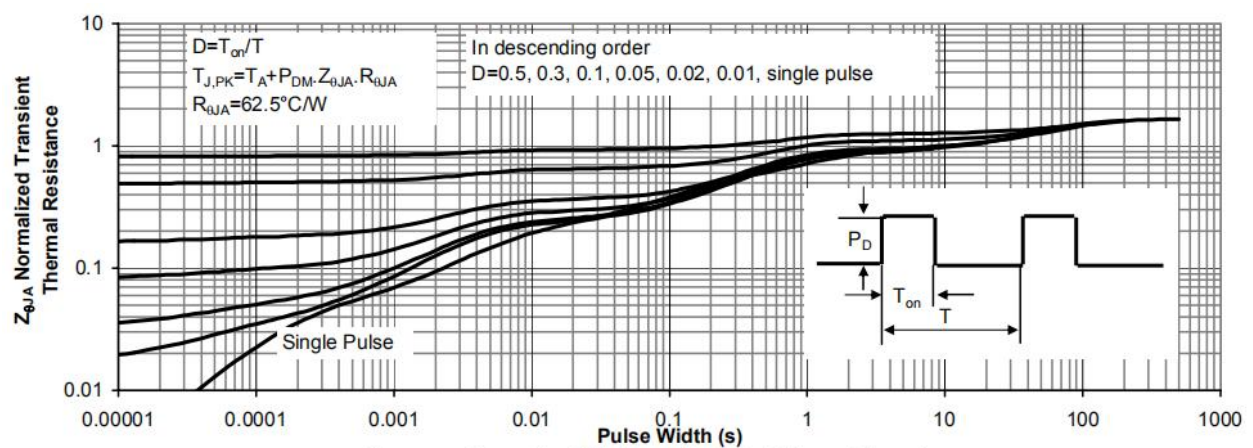


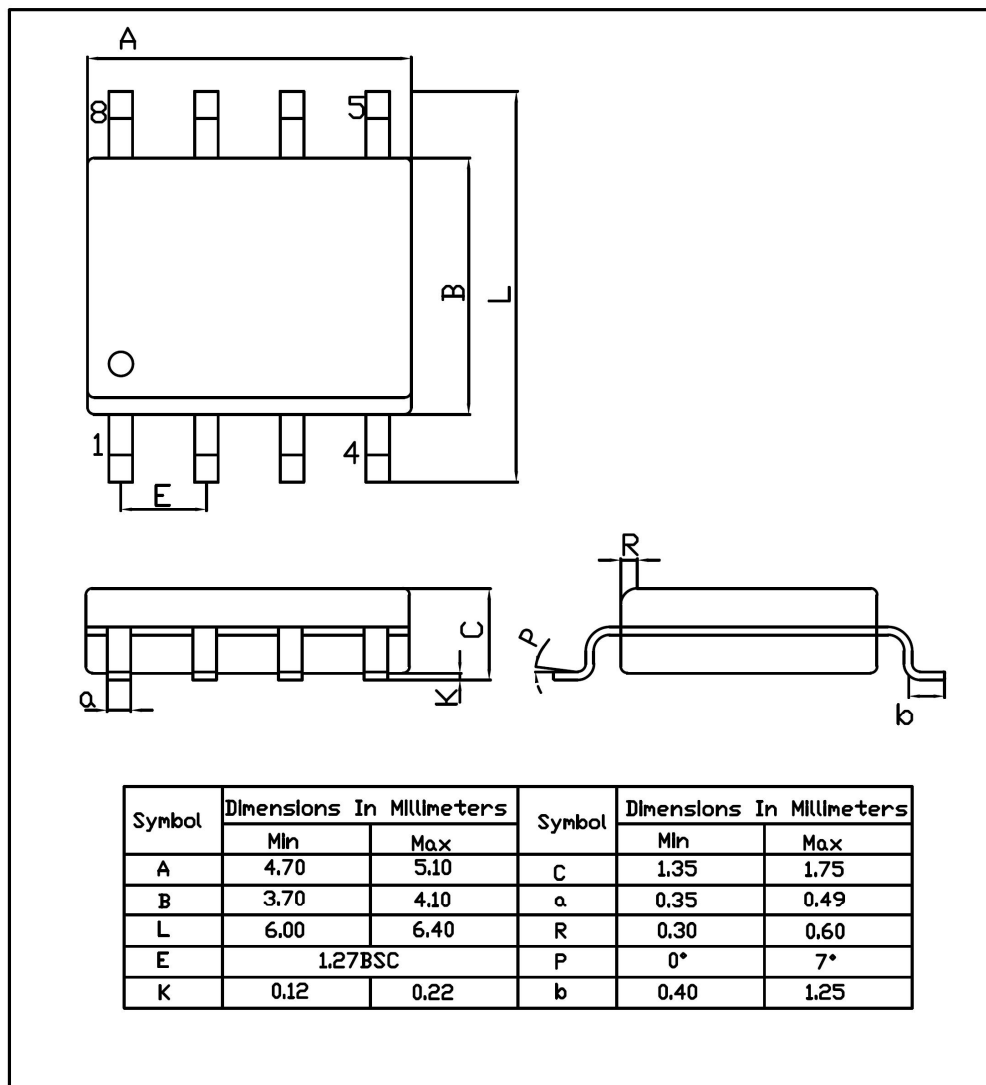
Figure 10 : Normalized Maximum Transient Thermal Impedance

Dimension outline

Unit:mm

SOP-8

Unit:mm



Suggested Pad Layout UNIT: mm

