SHANGHAI SINO-IC
MICROELECTRONICS CO., LTD.

June 2006

SE4606L

Complementary Enhancement Mode Field Effect Transistor

Revision:A

Features

- n-channel,
  V_{DS} (V) = 20V ,I_D = 7A
  $R_{DS(ON)}$ =20.0mΩ (V_{GS}=4.5V)
- p-channel,
  V_{DS} (V) = -18V ,I_D =- 5A
  $R_{DS(ON)}$ =30mΩ (V_{GS}=-4.5V)

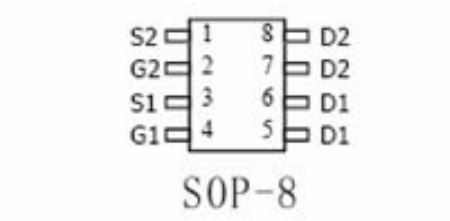
Applications

- Power Management in Desktop or DC/DC Converters

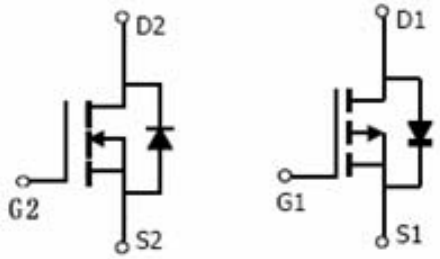
Construction

- Silicon epitaxial planer

External Dimensions: (Unit:mm)



SOP-8



n-channel p-channel

Absolute maximum ratings (Ta=25℃)

Parameter	Symbol		Max n-channel	Max P-channel	Unit
Drain-Source Voltage	V_{DS}		20	-18	V
Gate-Source Voltage	V_{GSS}		±8	±8	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	TA=25°C	7.0	-5	A
		TA=70°C	7.4	-4	
	I_{DM}		50	-30	A
Maximum Power Dissipation	P_D		3	2	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}		-55 To 150	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62.5	62.5	℃/W

N-Channel Electrical Characteristics (TJ=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20			V

Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA		0.65		V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.5A		20	23.5	mΩ
		V_{GS}=2.5V, I_D=-4.1A		25	32	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=5A	10	17		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz		680		PF
Output Capacitance	C_{oss}			102		PF
Reverse Transfer Capacitance	C_{rss}			77		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V, V_{GS}=10V, R_{GEN}=3Ω, R_L=2.2Ω		4.6		nS
Turn-on Rise Time	t_r			4.1		nS
Turn-Off Delay Time	$t_{d(off)}$			20.6		nS
Turn-Off Fall Time	t_f			5.2		nS
Total Gate Charge	Q_g	V_{DS}=15V,I_{DS}=6.9A, V_{GS}=10V		13.8		nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	I_{SD}=1A		0.76	1	V

P-Channel Electrical Characteristics (TJ=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-15			V

Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-12V,V_{GS}=0V			-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	.	-0.65		V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.9A		31	42	mΩ
		V_{GS}=-2.5V, I_D=-5A		36	56	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-12V,I_D=-4.5A	5	10		S
DYNAMIC CHARACTERISTICS (Note4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=-12V, V_{GS}=-10V, R_{GEN}=3Ω, R_L=2.7Ω		12		nS
Turn-on Rise Time	t_r			3		nS
Turn-Off Delay Time	$t_{d(off)}$			22		nS
Turn-Off Fall Time	t_f			4		nS
Total Gate Charge	Q_g	V_{DS}=-12V,I_{DS}=-6A, V_{GS}=-10V		10		nC
Gate-Source Charge	Q_{gs}			3.3		nC
Gate-Drain Charge	Q_{gd}			1.8		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	I_{SD}=-1.7A		-0.8	-1.2	V

N-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

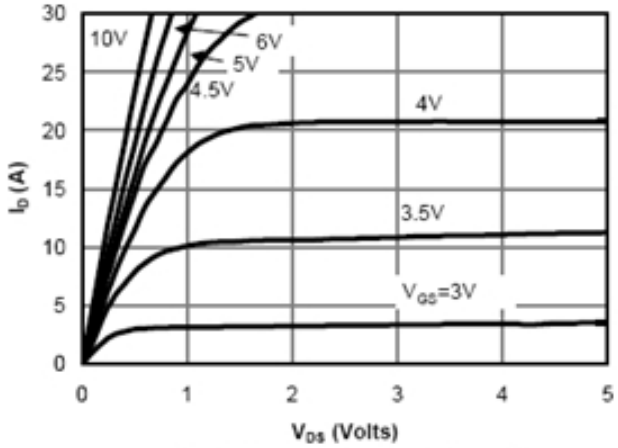


Fig 1: On-Region Characteristics

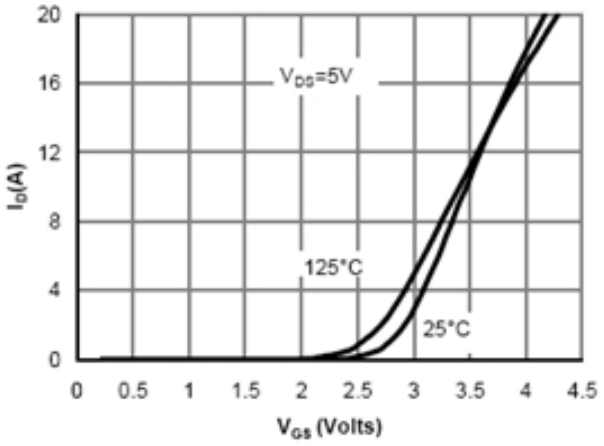


Figure 2: Transfer Characteristics

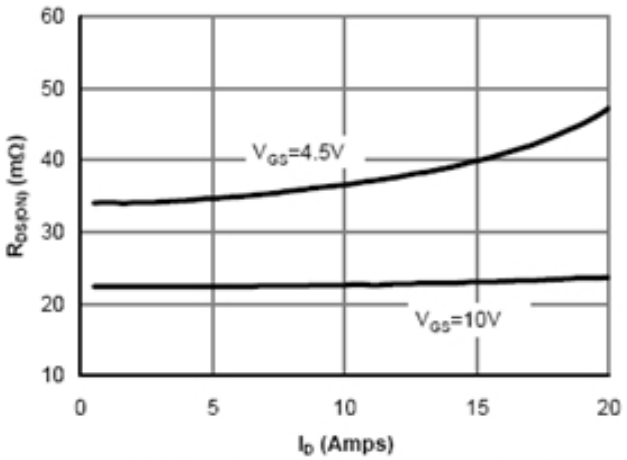


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

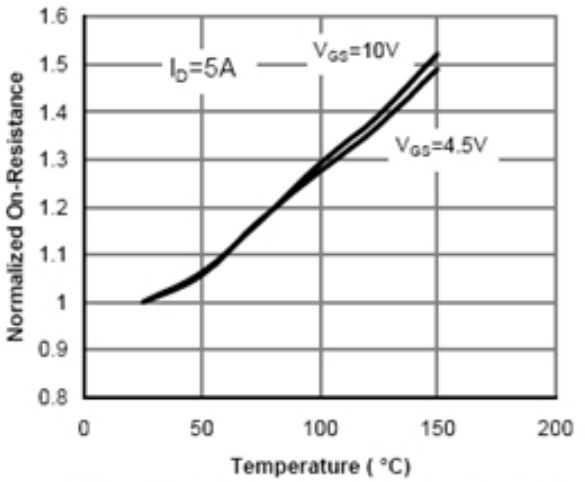


Figure 4: On-Resistance vs. Junction Temperature

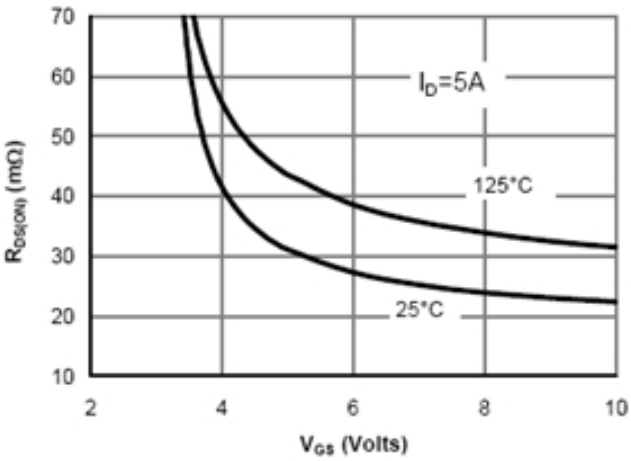


Figure 5: On-Resistance vs. Gate-Source Voltage

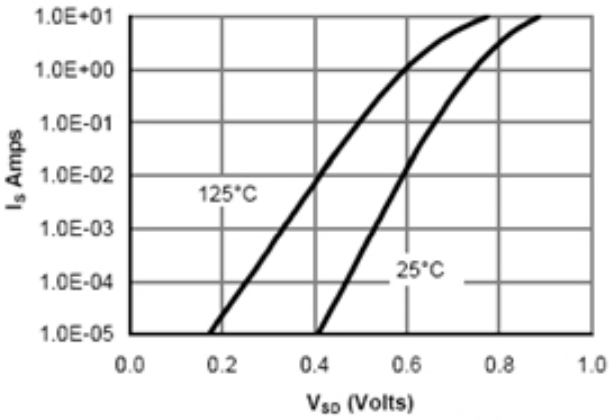


Figure 6: Body diode characteristics

N-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

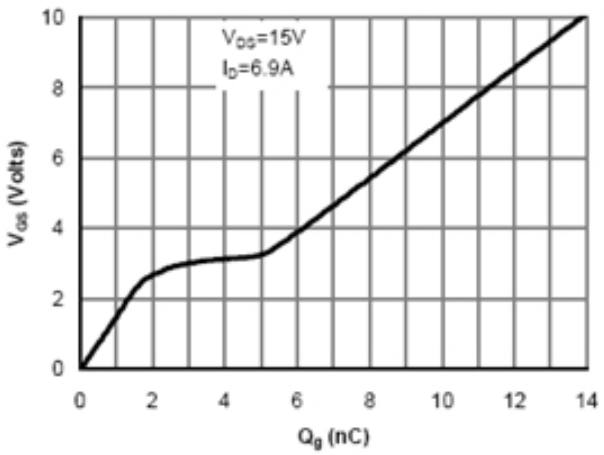


Figure 7: Gate-Charge characteristics

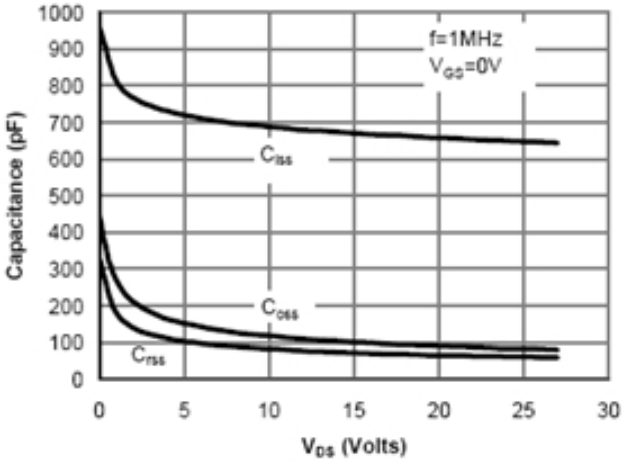


Figure 8: Capacitance Characteristics

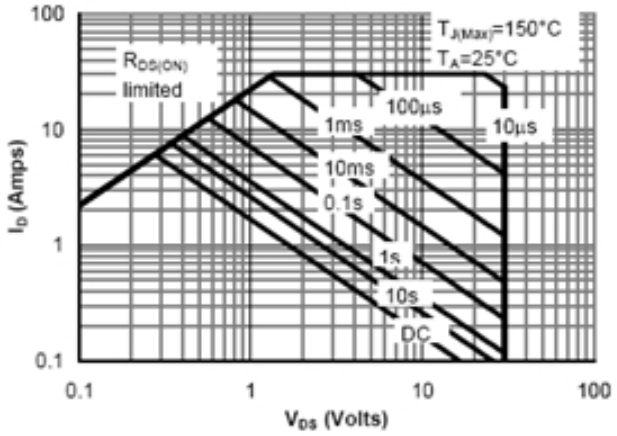


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

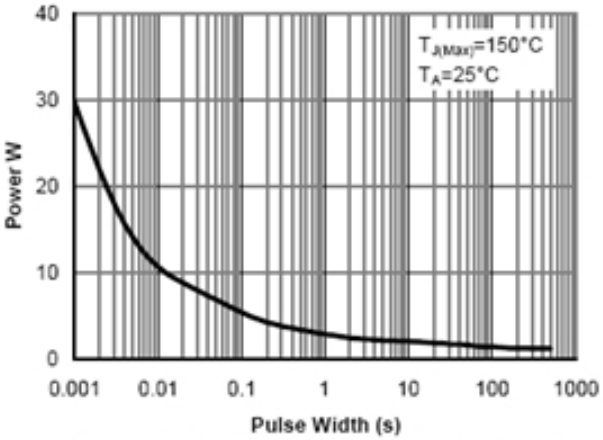


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

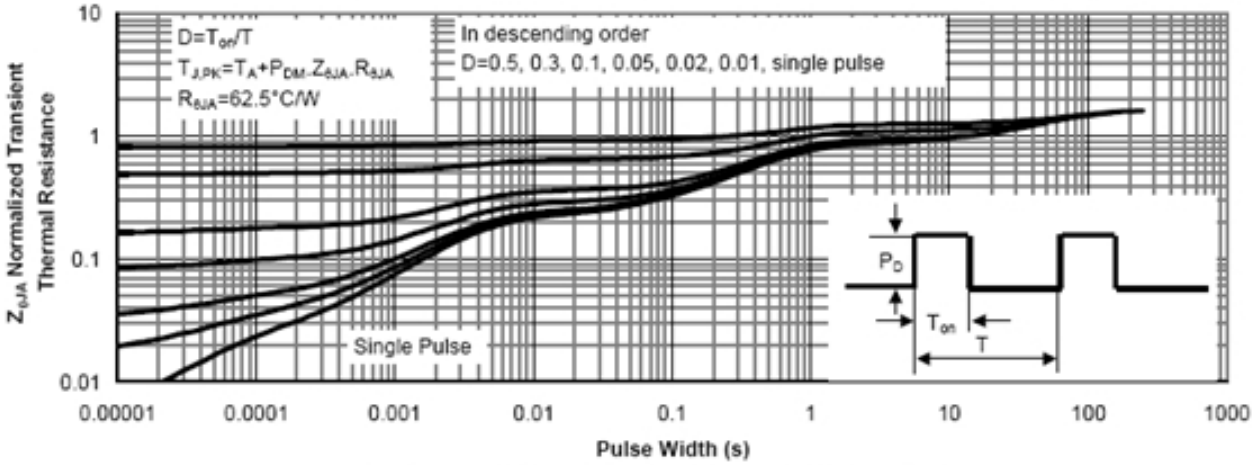


Figure 11: Normalized Maximum Transient Thermal Impedance

P-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

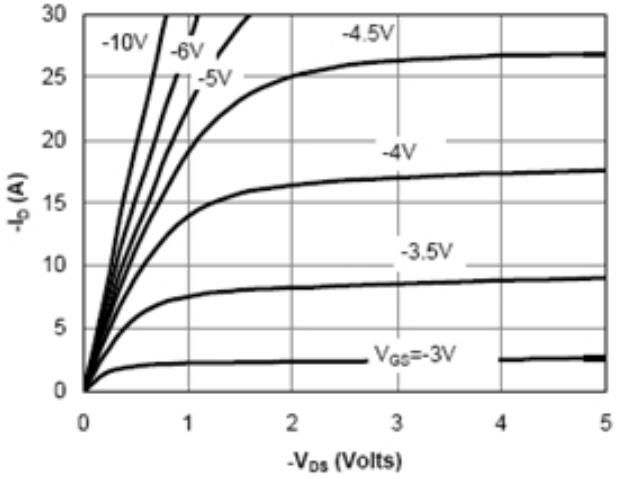


Fig 1: On-Region Characteristics

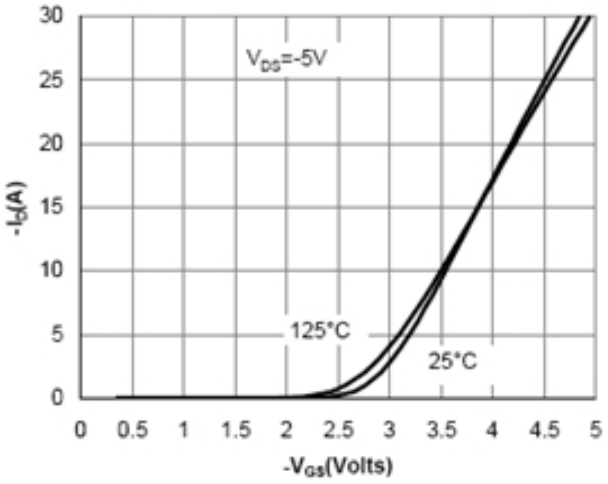


Figure 2: Transfer Characteristics

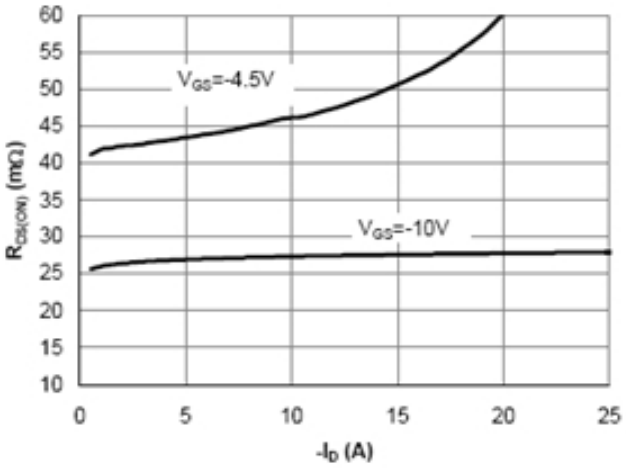


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

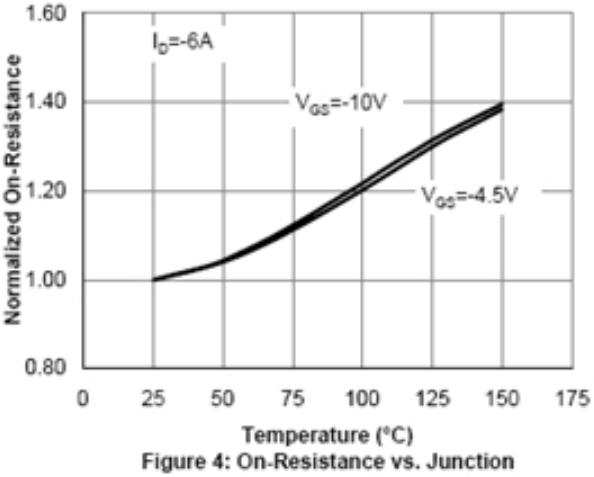


Figure 4: On-Resistance vs. Junction Temperature

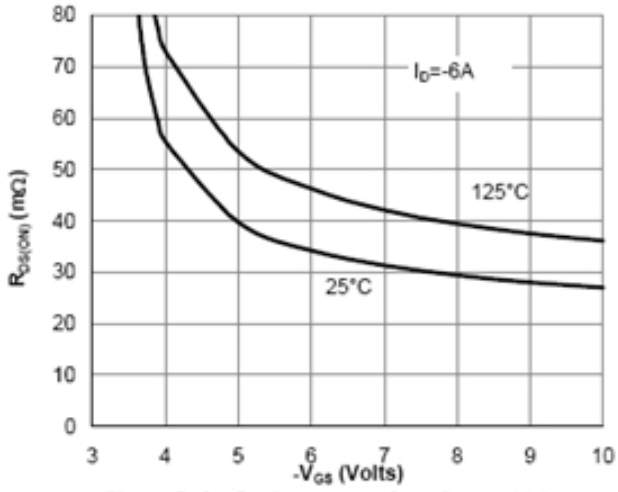


Figure 5: On-Resistance vs. Gate-Source Voltage

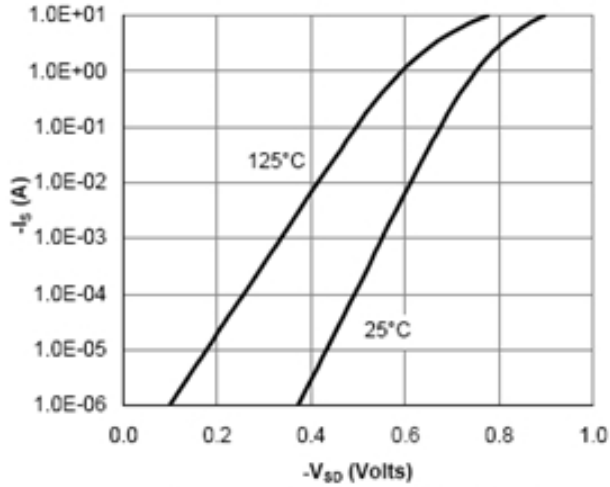


Figure 6: Body-Diode Characteristics

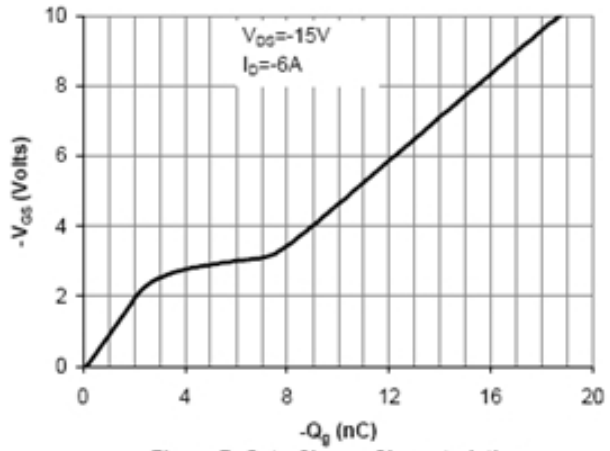


Figure 7: Gate-Charge Characteristics

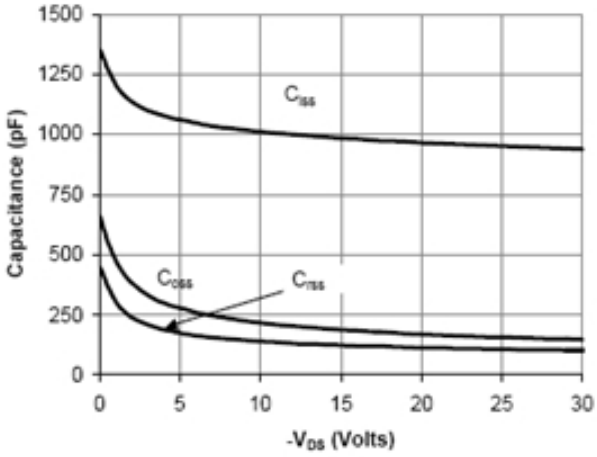
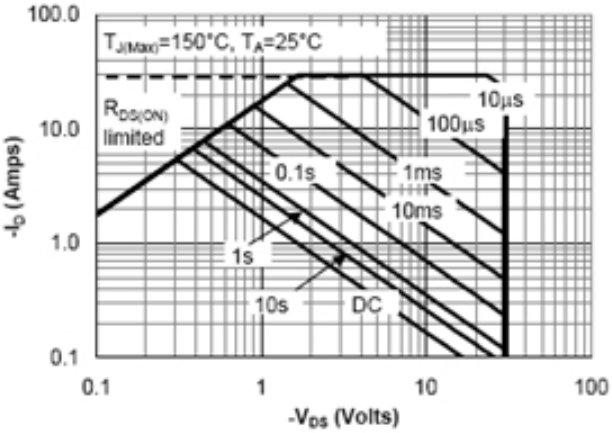


Figure 8: Capacitance Characteristics



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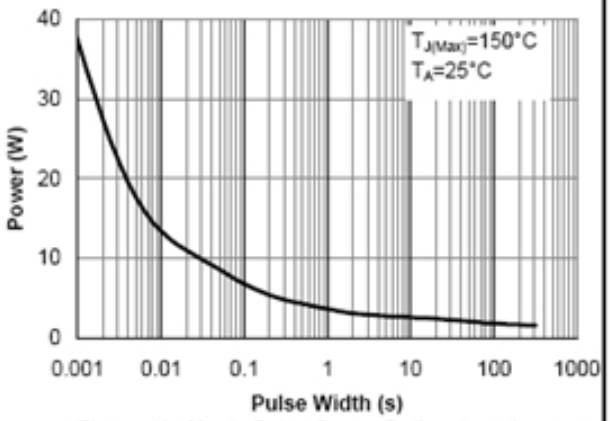


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

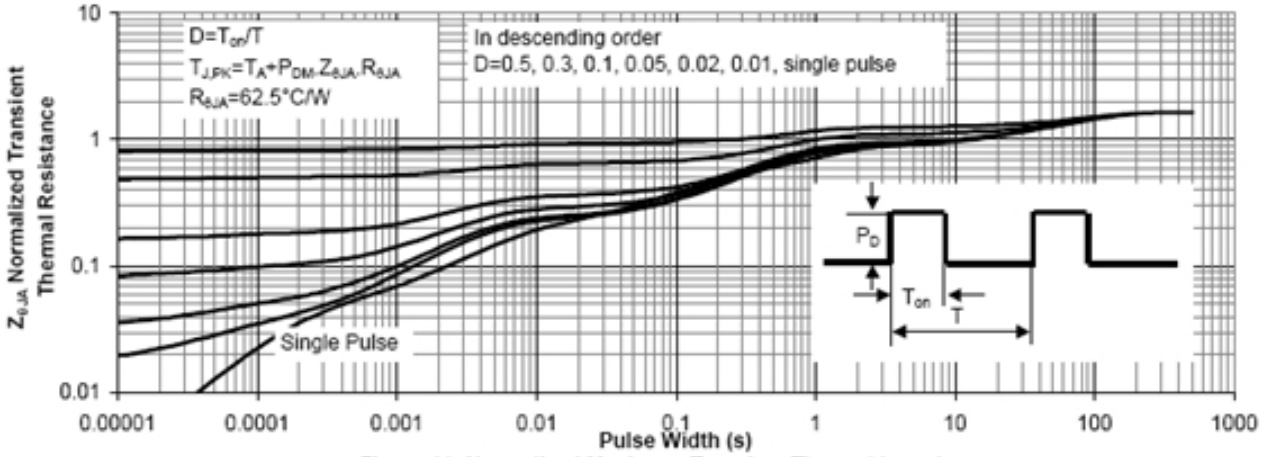
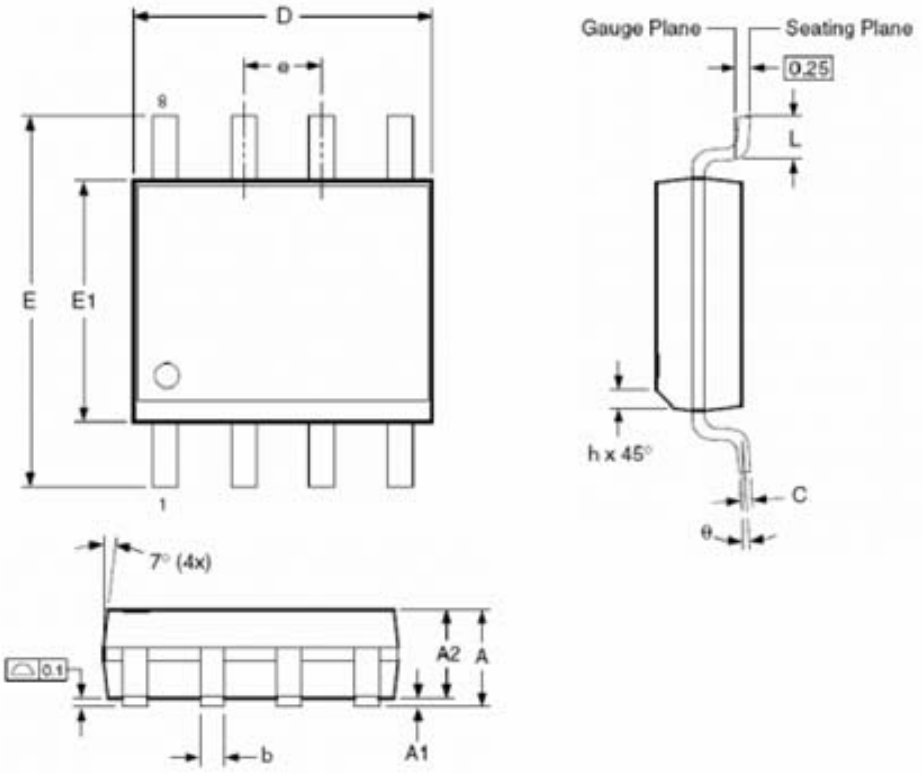


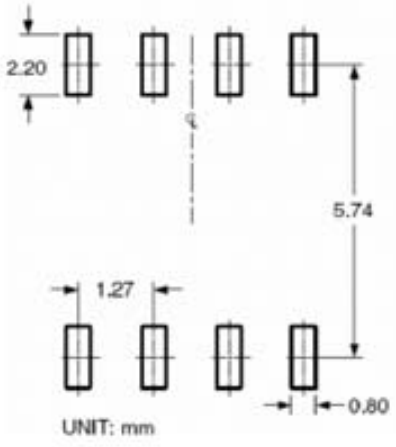
Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	0.228	0.236	0.244
h	0.010	—	0.020
L	0.016	—	0.050
θ	0°	—	8°

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