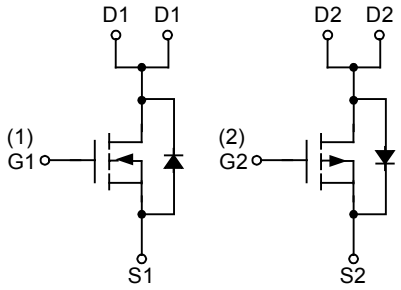
■ PRODUCT CHARACTERISTICS

N-CHANNEL		P-CHANNEL	
V_{DSS}	40V	V_{DSS}	-40V
$R_{DS(ON)}$Typ(@V_{GS}=10V)	23mΩ	$R_{DS(ON)}$Typ(@V_{GS}=-10V)	45mΩ
$R_{DS(ON)}$Typ(@V_{GS}=4.5V)	26mΩ	$R_{DS(ON)}$Typ(@V_{GS}=-4.5V)	55mΩ
I_D	8A	I_D	-6A

Symbol

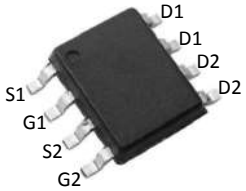


■ APPLICATIONS

* Electronic lamp ballasts based on half bridge
* Load Switching,Quick/Wirelss Charge.
* Motor Driving

■ FEATURE

* Low Gate Charge
* Pb-Free Lead Plating



SOP8

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4656S	SOP8	5000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C,unless otherwise specified)

Parameter	Symbol	N-channel	P-channel	Unit
Drain-Source Voltage	V_{DSS}	40	-40	V
Gate-Source Voltage	V_{GSS}	±20	±20	V
Drain Current Continuous(@V_{GS}=10±V ,T_A=25°C)	I_D	8	-6	A
Drain Current Pulsed	I_{DM}	32	-24	A
Avalanche Energy	E_{AS}	36	42	mJ
Power Dissipation	P_D	3.2		W
Junction Temperature	T_J	+150		°C
Storage Temperature	T_{STG}	-55~ +150		°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Ambient	R_{thJA}	39	°C/W

■ N-MOS ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V	-	-	-1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V,V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V ,V_{DS}=0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=5A	-	23	30	mΩ
		V_{GS}=4.5V,I_D=5A	-	26	32	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	1	1.4	2.5	V
Dynamic characteristics						
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	3.9	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=5V,I_D=5A	-	10	-	S
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1.0MHz	-	790	-	pF
Output Capacitance	C_{oss}		-	60	-	pF
Reverse Transfer Capacitance	C_{rss}		-	40	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DS}=20V, I_D=8A ,R_G=3Ω	-	4	-	ns
Rise Time	t_r		-	3	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	15	-	ns
Fall Time	t_f		-	2	-	ns
Total Gate Charge	Q_g	I_D=8A, V_{DS}=20V V_{GS}=10V	-	12	-	nC
Gate to Source Charge	Q_{gs}		-	3.2	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	3.1	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	8	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	32	A
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V	-	0.76	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=8A, T_J=25°C dI/dt=100A/μs	-	26	-	ns
Reverse Recovery Charge	Q_{rr}		-	15	-	nC

■ P-MOS ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=-250μA	-40	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=-40V,V_{GS}=0V	-	-	-1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V,V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V ,V_{DS}=0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-5A	-	45	51	mΩ
		V_{GS}=-4.5V,I_D=-5A	-	55	60	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-2.5	V
Dynamic characteristics						
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	10	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-5A	-	10	-	S
Input Capacitance	C_{iss}	V_{DS}=-20V,V_{GS}=0V f=1.0MHz	-	775	-	pF
Output Capacitance	C_{oss}		-	60	-	pF
Reverse Transfer Capacitance	C_{rss}		-	50	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	V_{GS}=-10V, V_{DS}=-20V, I_D=-6 A ,R_G=6Ω	-	7.5	-	ns
Rise Time	t_r		-	5.5	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	19	-	ns
Fall Time	t_f		-	7	-	ns
Total Gate Charge	Q_g	I_D=-6 A, V_{DS}=-20V V_{GS}=-10V	-	13	-	nC
Gate to Source Charge	Q_{gs}		-	3.8	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	3.1	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	-6	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	-24	A
Diode Forward Voltage	V_{SD}	I_{SD}=-1A, V_{GS}=0V	-	-0.76	-1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=-6 A, T_J=25°C dI/dt=100A/μs	-	18	-	ns
Reverse Recovery Charge	Q_{rr}		-	10	-	nC

■ N-MOS TYPICAL CHARACTERISTICS

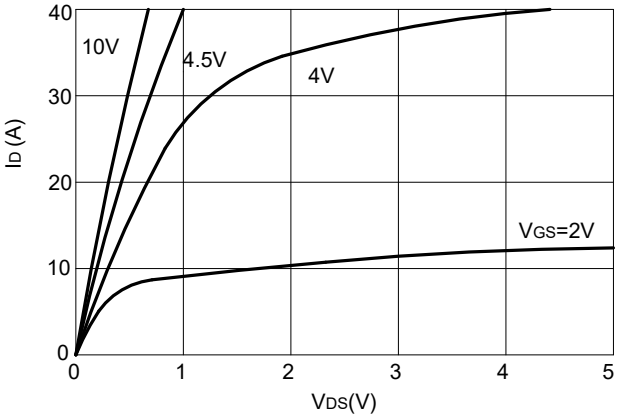


Figure 1: Output Characteristics

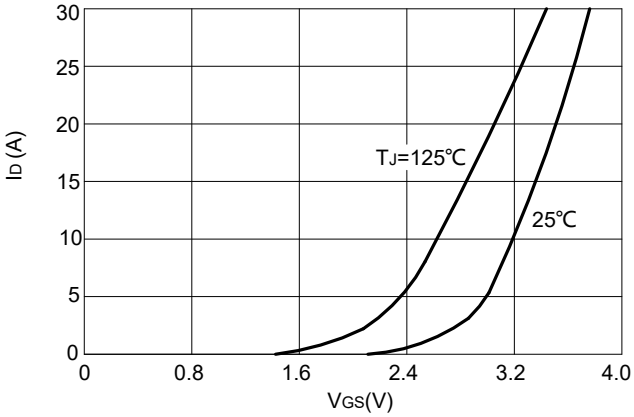


Figure 2: Typical Transfer Characteristics

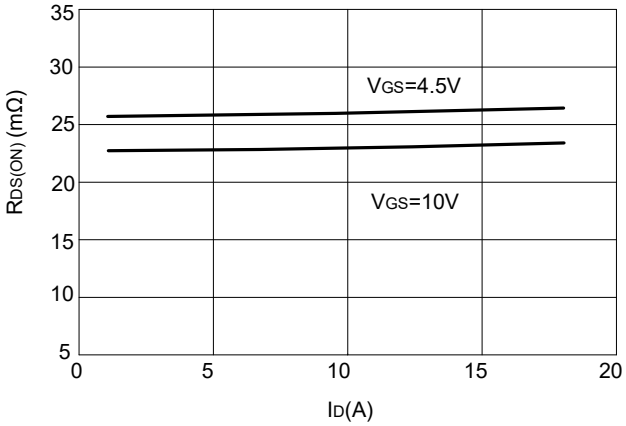


Figure 3: On-resistance vs. Drain Current

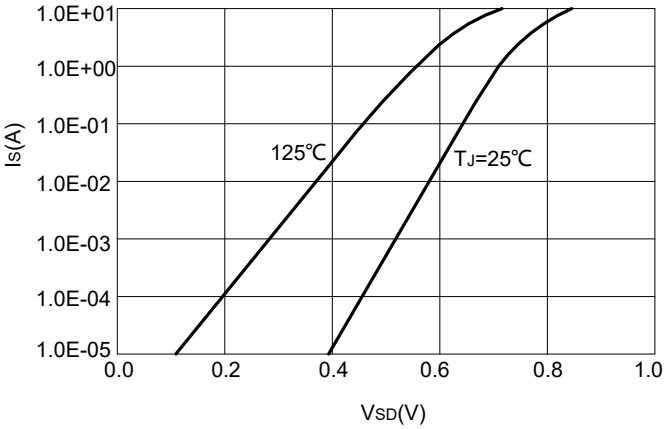


Figure 4: Body Diode Characteristics

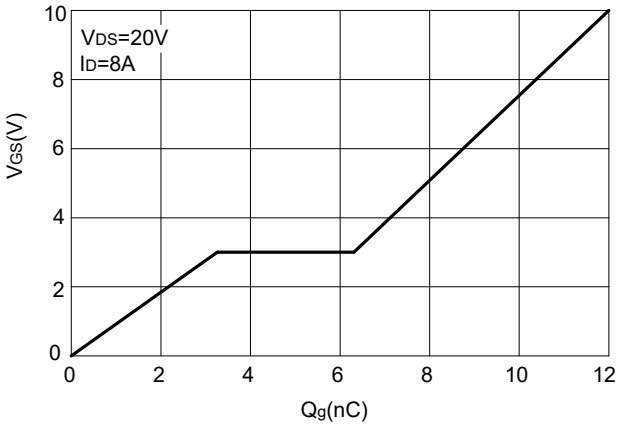


Figure 5: Gate Charge Characteristics

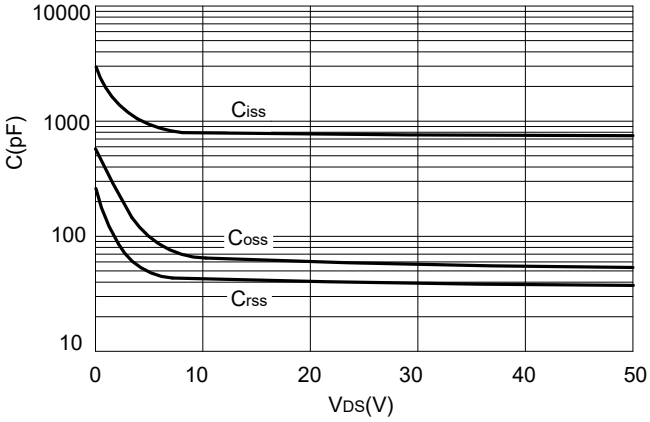


Figure 6: Capacitance Characteristics

■ N-MOS TYPICAL CHARACTERISTICS(Cont.)

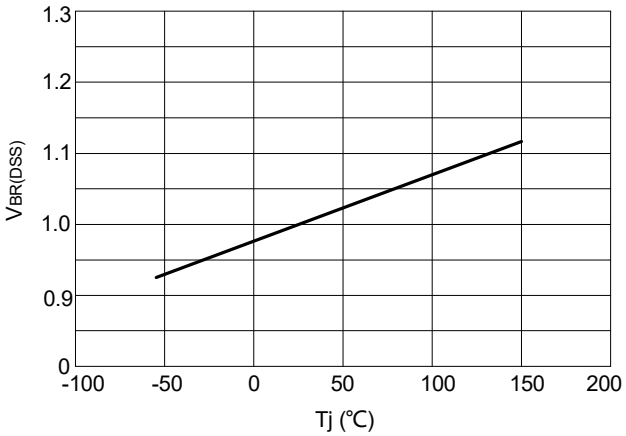


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

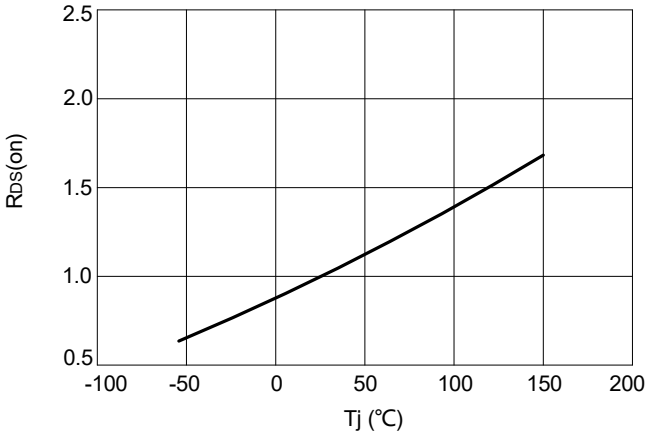


Figure 8: Normalized on Resistance vs. Junction Temperature

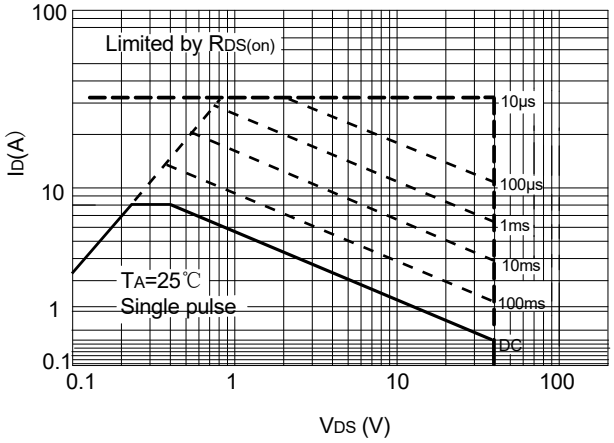


Figure 9: Maximum Safe Operating Area

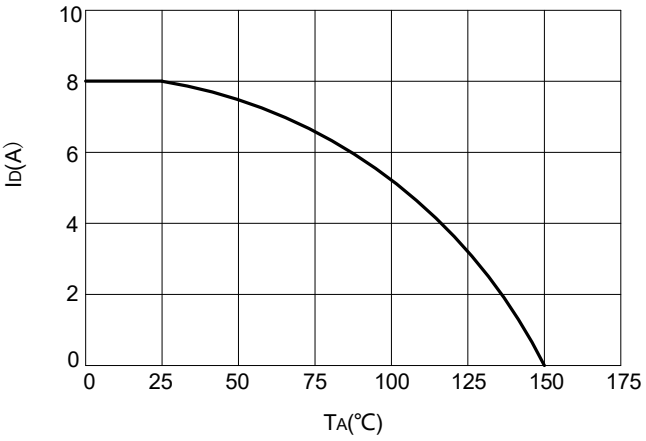


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

■ P-MOS TYPICAL CHARACTERISTICS

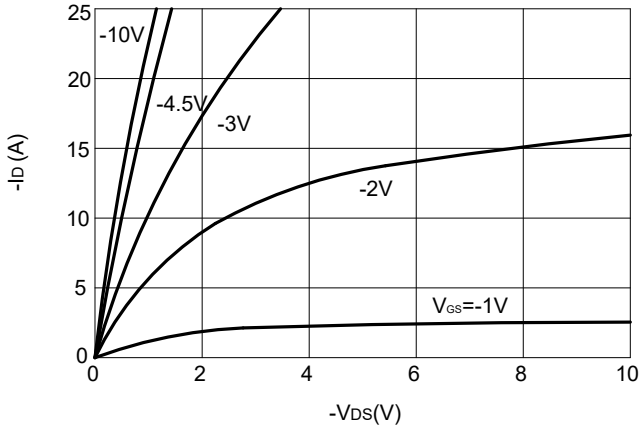


Figure 1: Output Characteristics

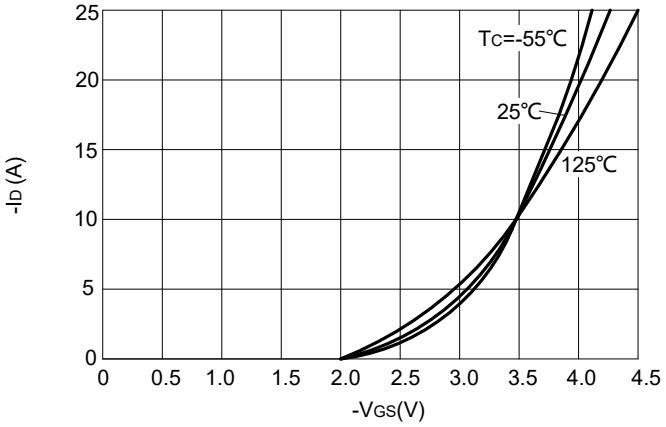


Figure 2: Typical Transfer Characteristics

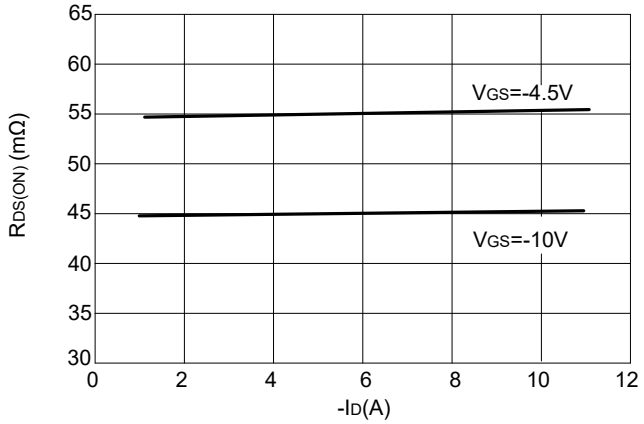


Figure 3: On-resistance vs. Drain Current

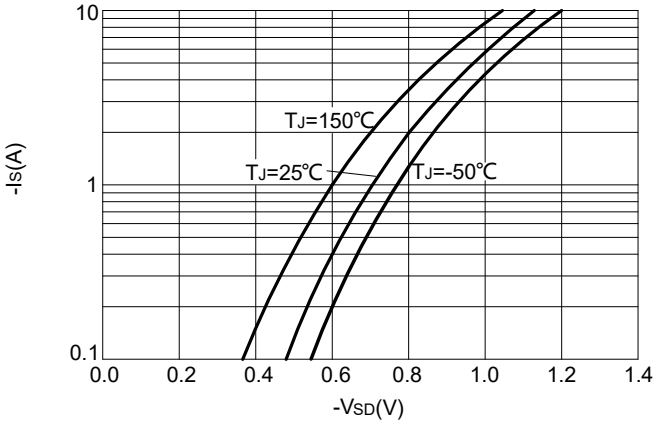


Figure 4:Body Diode Characteristics

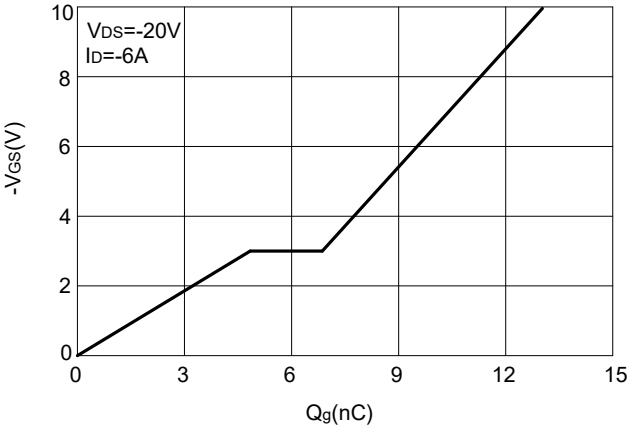


Figure 5: Gate Charge Characteristics

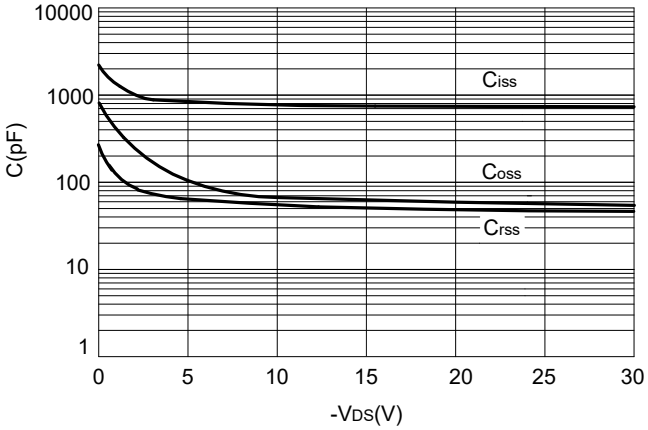


Figure 6: Capacitance Characteristics

■ P-MOS TYPICAL CHARACTERISTICS(Cont.)

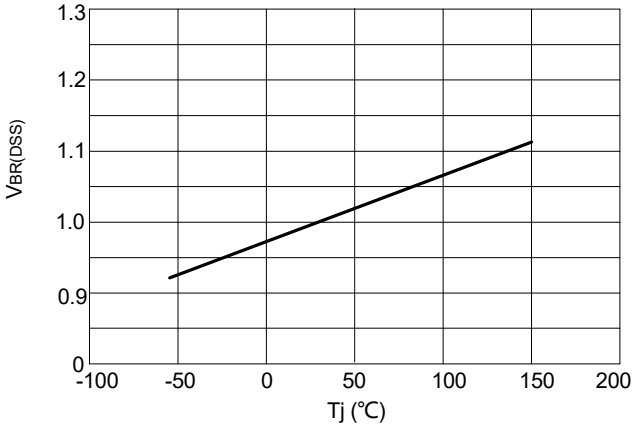


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

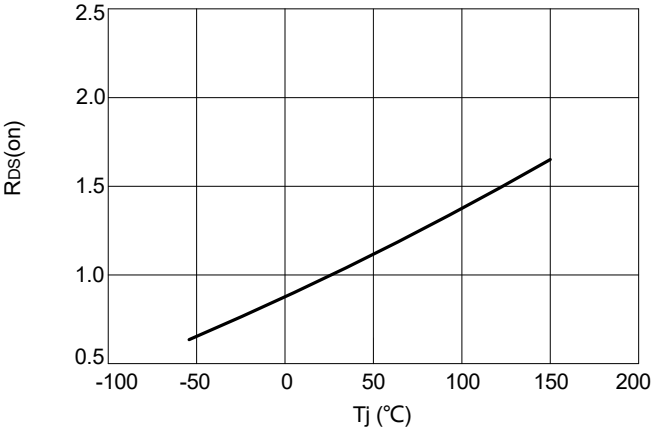


Figure 8: Normalized on Resistance vs. Junction Temperature

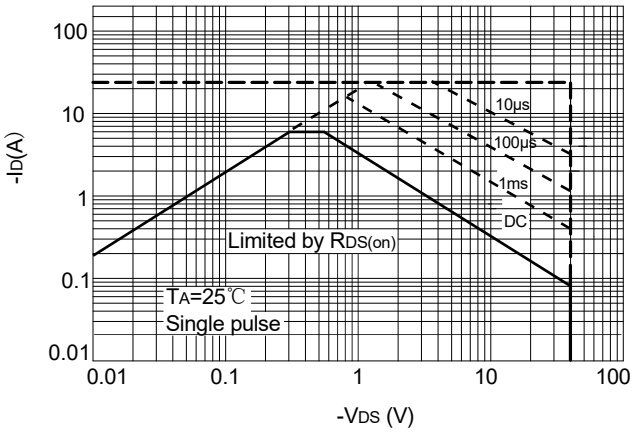


Figure 9: Maximum Safe Operating Area

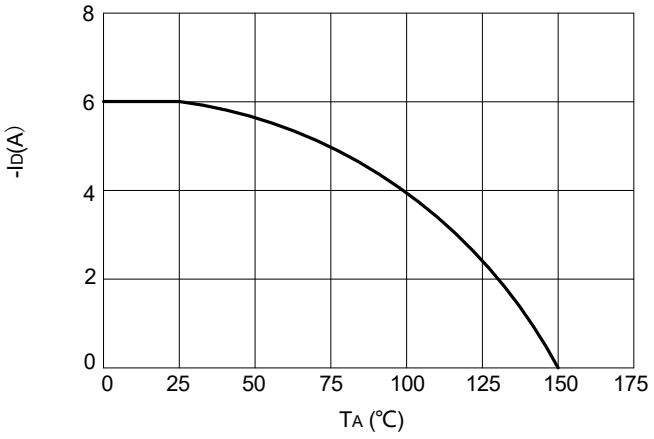
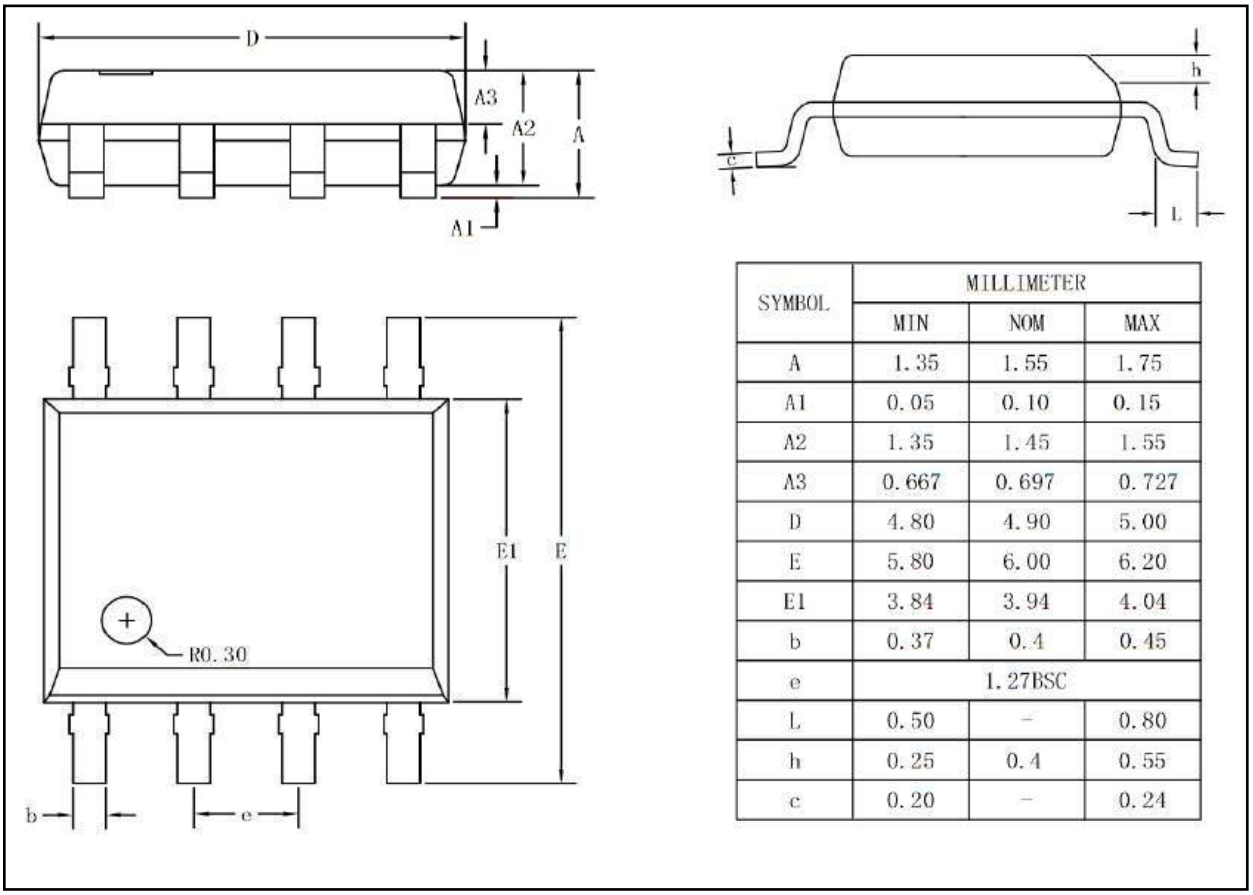


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

■ SOP8 PACKAGE OUTLINE DIMENSIONS



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.05	0.10	0.15
A2	1.35	1.45	1.55
A3	0.667	0.697	0.727
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.84	3.94	4.04
b	0.37	0.4	0.45
e	1.27BSC		
L	0.50	-	0.80
h	0.25	0.4	0.55
c	0.20	-	0.24