GSM4599C

60V N & P Pair Enhancement Mode MOSFET

Product Description

These miniature surface mount MOSFETs utilize High Cell Density process. Low $R_{DS(ON)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry.

Typical applications are PWM DC-DC converters, power management in portable and battery powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

Features

N-Channel

- 60V, 4.5A, $R_{DS(ON)}$=58mΩ@V_{GS}=10V
- 60V, 4.0A, $R_{DS(ON)}$=85mΩ@V_{GS}=4.5V

P-Channel

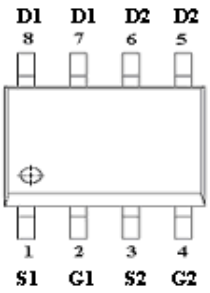
- -60V, -3.5A, $R_{DS(ON)}$=90mΩ@V_{GS}=-10V
- -60V, -3.0A, $R_{DS(ON)}$=135mΩ@V_{GS}=-4.5V
- Fast switching speed
- SOP-8 package design

Applications

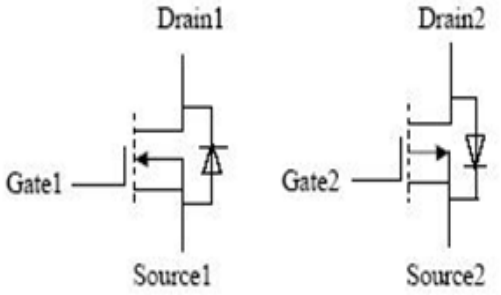
- Power Management in Note
- Portable Equipment / LCD Display inverter
- Battery Powered System / Load Switch

Packages & Pin Assignments

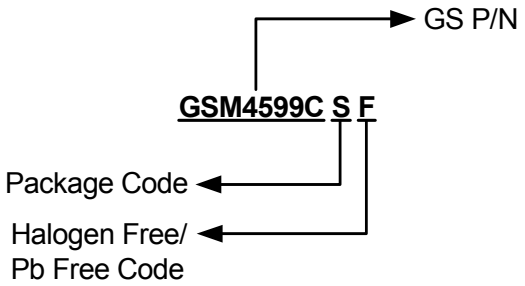
GSM4599CSF (SOP-8)

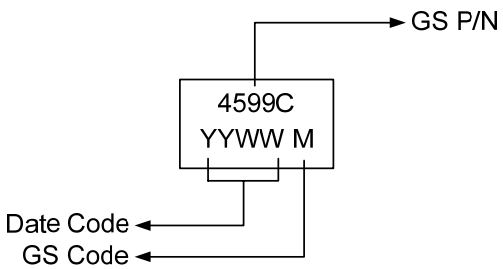


Pin	Description	Pin	Description
1	Source1	5	Drain2
2	Gate1	6	Drain2
3	Source2	7	Drain1
4	Gate2	8	Drain1



Ordering & Marking Information





Part Number	Package	Quantity Reel
GSM4599CSF	SOP-8	4000 PCS

Absolute Maximum Ratings (N-Channel)

(T_A=25ºC unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (*1)	T_A=25ºC	4.5	A
		T_A=70ºC	4	
I_{DM}	Pulsed Drain Current (*2)		20	A
I_S	Continuous Source Current (Diode Conduction) (*1)		1.3	A
P_D	Power Dissipation (*1)	T_A=25ºC	2	W
		T_A=70ºC	1.3	
T_J	Operating Junction Temperature Range		-55 to 150	ºC
T_{STG}	Storage Temperature Range		-55 to 150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient (*1)		62.5	ºC/ W

Note 1: Surface Mounted on 1" x 1" FR4 Board.

Note 2: Pulse width limited by maximum junction temperature.

Electrical Characteristics (N-Channel)

(T_A=25ºC unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1	1.5	2.5	
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V,V_{GS}=0V			1	uA
$I_{D(on)}$	On-State Drain Current (*3)	V_{DS}≧5V,V_{GS}=10V	20			A
$R_{DS(on)}$	Drain-Source On-Resistance (*3)	V_{GS}=10V,I_D=4.5A		40	58	mΩ
		V_{GS}=4.5V,I_D=4A		55	85	
g_{FS}	Forward Transconductance (*3)	V_{DS}=10V,I_D=4.5A		14		S
Dynamic						
Q_g	Total Gate Charge	V_{DS}=0.5$V_{(BR)DSS}$, V_{GS}=10V,I_D=4.5A		12		nC
Q_{gs}	Gate-Source Charge			2.4		
Q_{gd}	Gate-Drain Charge			2.6		
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, I_D=1A,V_{GS}=10V, R_G=6Ω		11		ns
T_r				8		
$t_{d(off)}$	Turn-Off Time			19		
T_f				6		

Note 3: Pulse test: PW≦300usec, duty cycle≦2%.

Absolute Maximum Ratings (P-Channel)

(T_A=25ºC unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (*1)	T_A=25ºC	-3.5	A
		T_A=70ºC	-3	
I_{DM}	Pulsed Drain Current (*2)		-20	A
I_S	Continuous Source Current (Diode Conduction) (*1)		-1.3	A
P_D	Power Dissipation (*1)	T_A=25ºC	2	W
		T_A=70ºC	1.3	
T_J	Operating Junction Temperature Range		-55 to 150	ºC
T_{STG}	Storage Temperature Range		-55 to 150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient (*1)		62.5	ºC/ W

Note 1: Surface Mounted on 1" x 1" FR4 Board.
Note 2: Pulse width limited by maximum junction temperature.

Electrical Characteristics (P-Channel)

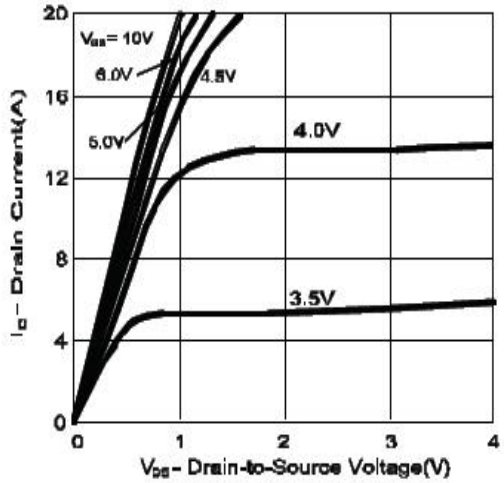
(T_A=25ºC unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1	-1.5	-2.5	
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-48V,V_{GS}=0V			-1	uA
$I_{D(on)}$	On-State Drain Current (*3)	V_{DS}≦-5V,V_{GS}=-10V	-20			A
$R_{DS(on)}$	Drain-Source On-Resistance (*3)	V_{GS}=-10V,I_D=-3.5A		70	90	mΩ
		V_{GS}=-4.5V,I_D=-3A		100	135	
g_{FS}	Forward Transconductance (*3)	V_{DS}=-5V,I_D=-3.5A		9		S
Dynamic						
Q_g	Total Gate Charge	V_{DS}=-0.5$V_{(BR)DSS}$, V_{GS}=-10V,I_D=-3.5A		11		nC
Q_{gs}	Gate-Source Charge			2.1		
Q_{gd}	Gate-Drain Charge			2.5		
$t_{d(on)}$	Turn-On Time	V_{DD}=-30V, I_D=-1A,V_{GS}=-10V, R_G=6Ω		6		ns
T_r				8		
$t_{d(off)}$	Turn-Off Time			17		
T_f				11		

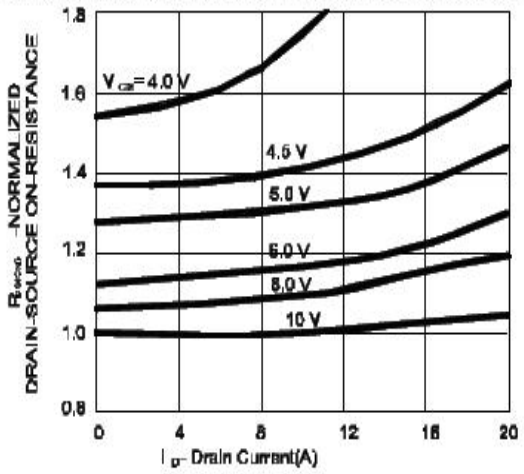
Note 3: Pulse test: PW≦300usec, duty cycle≦2%.

Typical Performance Characteristics (N-Channel)

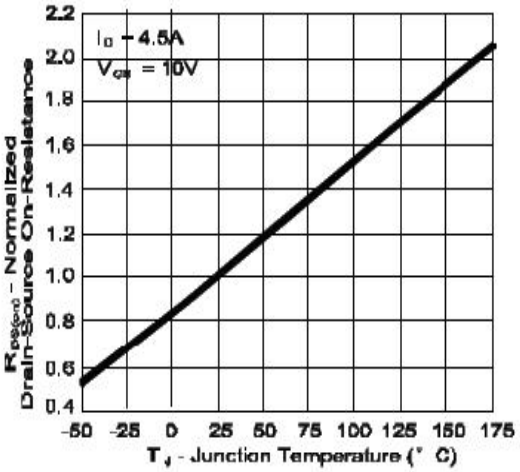
On-Region Characteristics



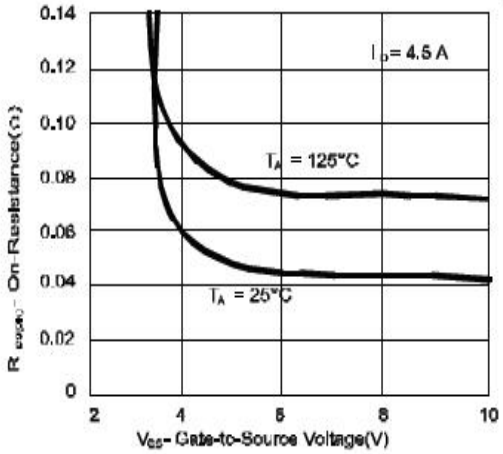
On-Resistance Variation with Drain Current and Gate Voltage



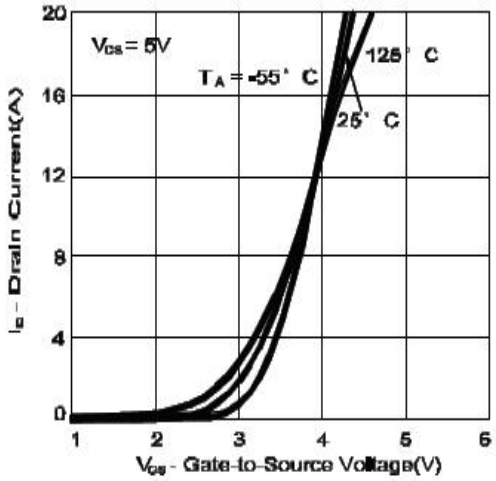
On-Resistance Variation with Temperature



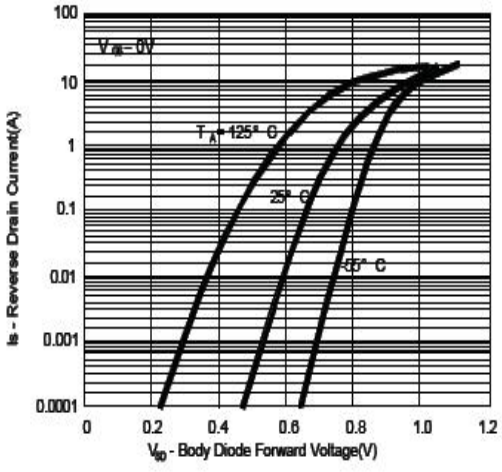
On-Resistance Variation with Gate-to-Source Voltage



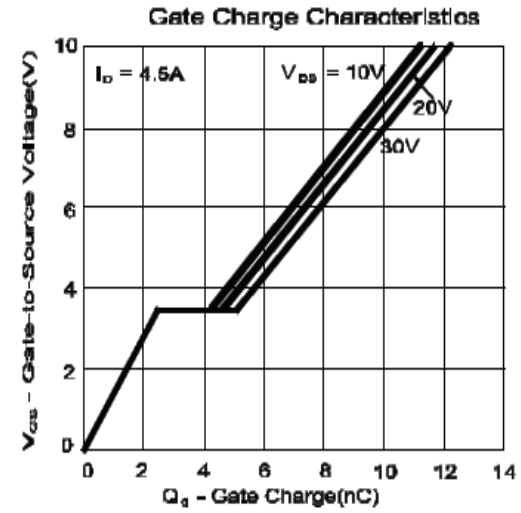
Transfer Characteristics

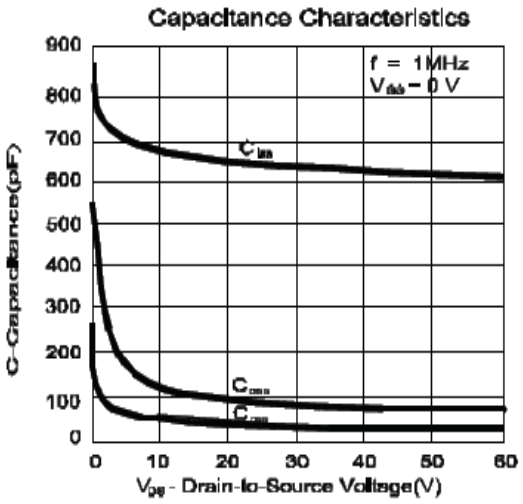


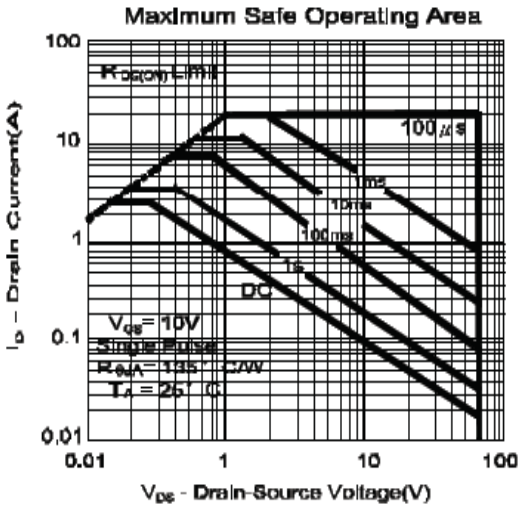
Body Diode Forward Voltage Variation with Source Current and Temperature

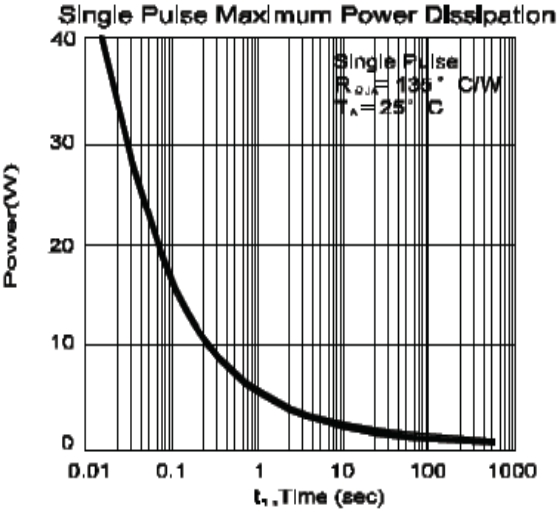


Typical Performance Characteristics (N-Channel)



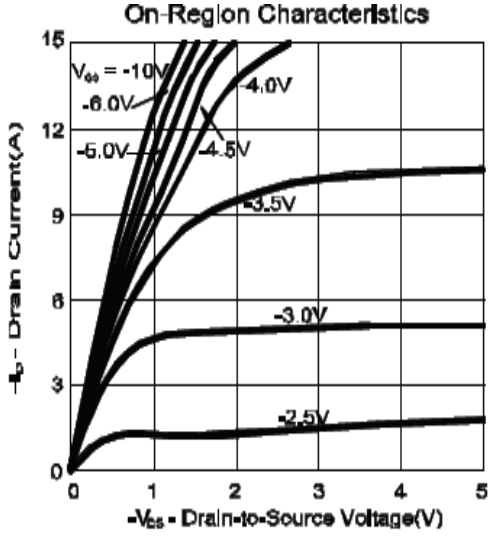




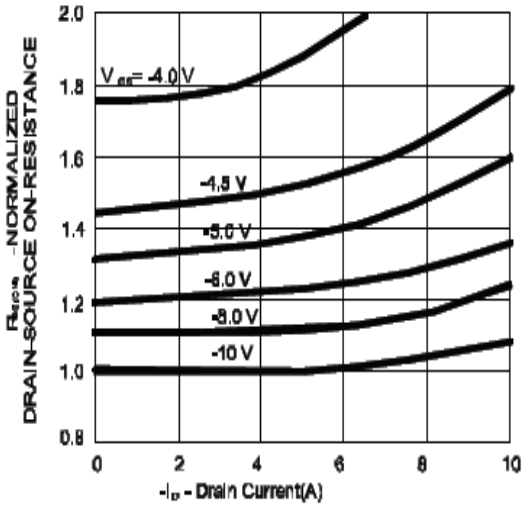


Typical Performance Characteristics (P-Channel)

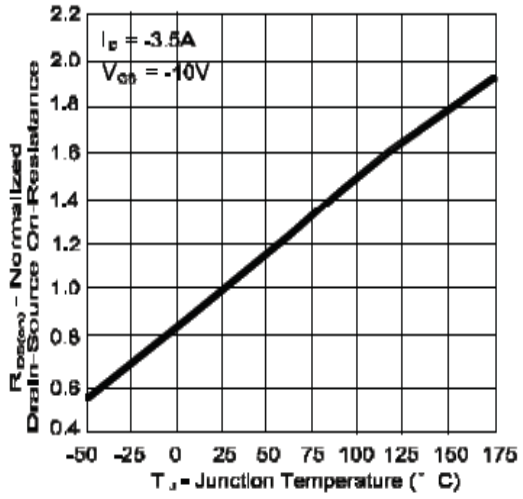
On-Region Characteristics



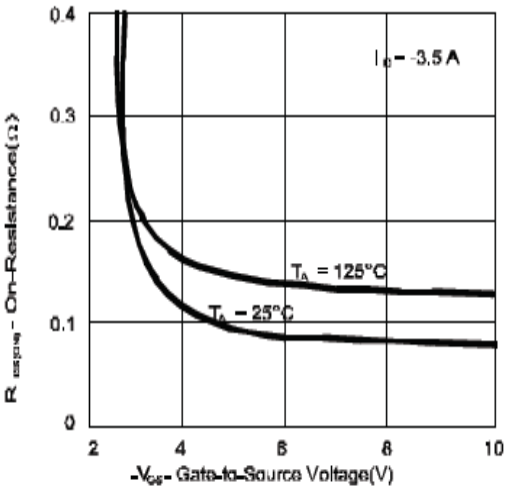
On-Resistance Variation with Drain Current and Gate Voltage



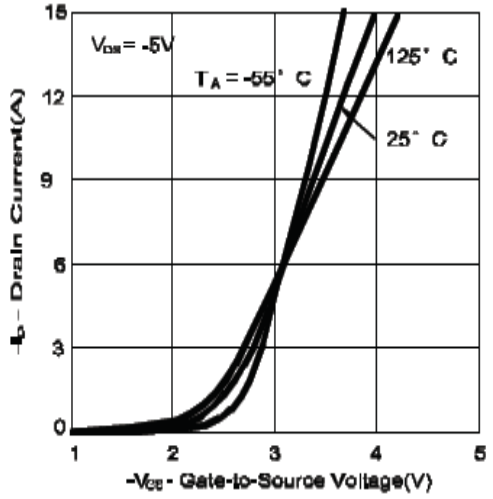
On-Resistance Variation with Temperature



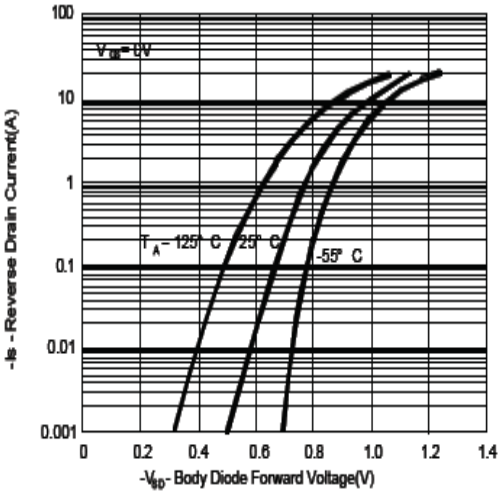
On-Resistance Variation with Gate-to-Source Voltage



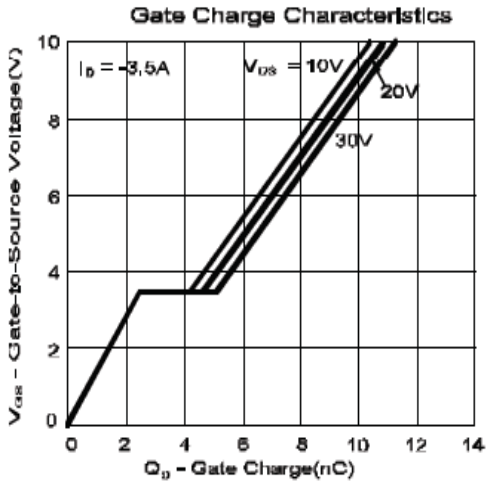
Transfer Characteristics

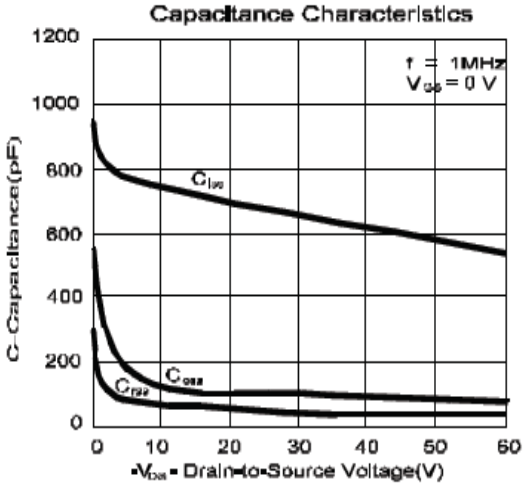


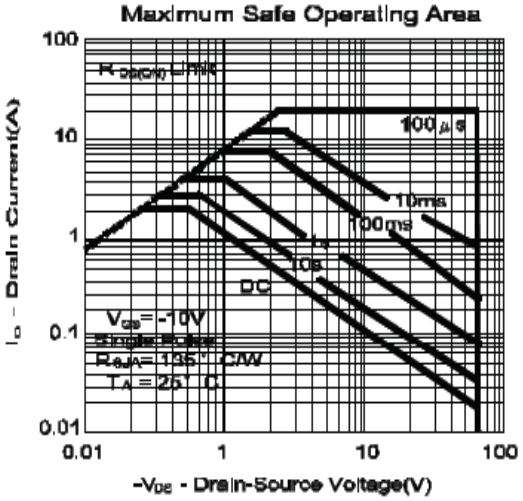
Body Diode Forward Voltage Variation with Source Current and Temperature

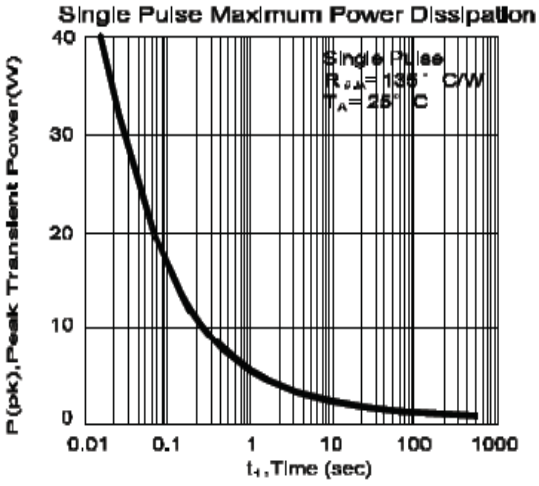


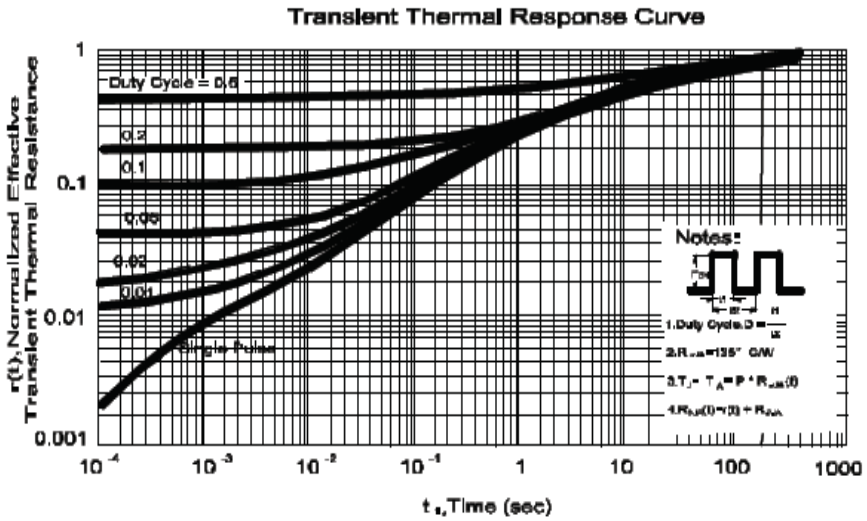
Typical Performance Characteristics (P-Channel)





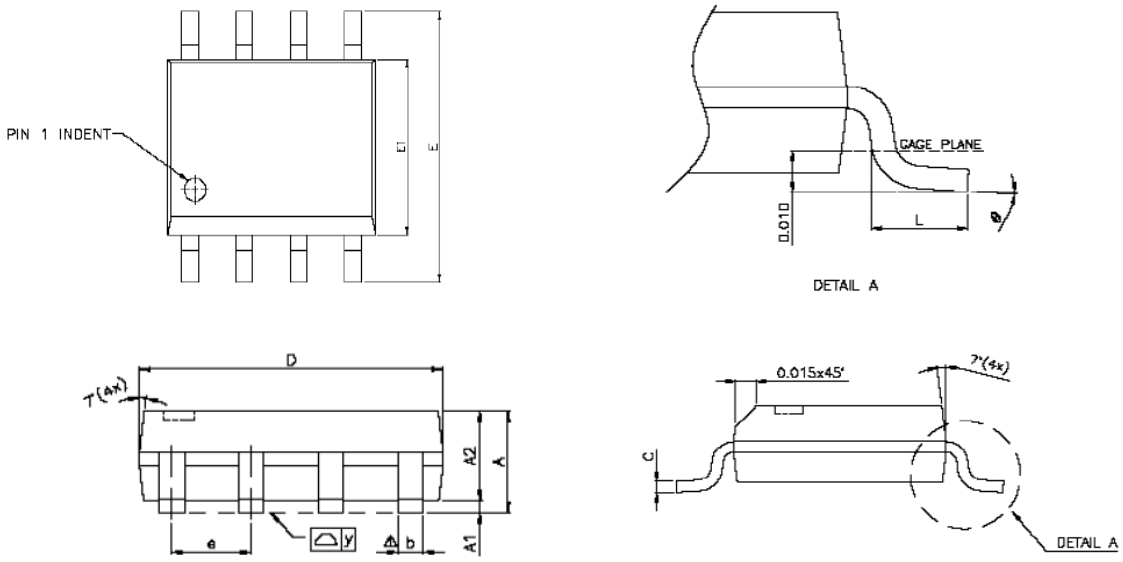






Package Dimension

SOP-8



Dimensions						
SYMBOL	Millimeters			Inches		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	-	0.25	0.004	-	0.010
A2	-	1.45	-	-	0.057	-
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	-	1.27	-	-	0.050	-
L	0.38	0.71	1.27	0.015	0.028	0.050
②y	-	-	0.076	-	-	0.003
θ	0°	-	8°	0°	-	8°

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