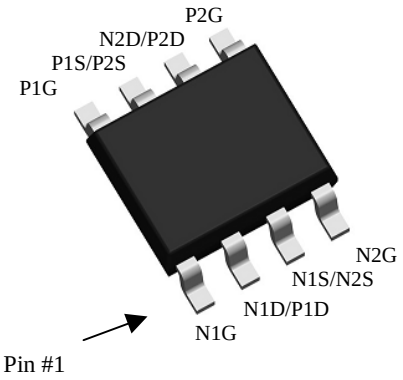
2N- and 2P-Channel Enhancement Mode MOSFET

Features:

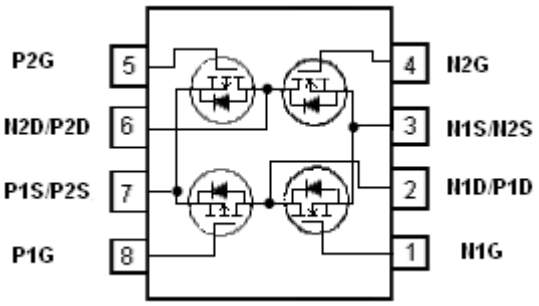
- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

SOP-8



Description :

The KSC9930 consists of two N-channel and two P-channel enhancement-mode MOSFET in a single SOP-8 package, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications.



G：Gate S：Source D：Drain

	N-CH	P-CH
BV_{DSS}	30V	-30V
I_D	6A	-4.4A
$R_{DSON(TYP.)}$	17mΩ	35mΩ

Ordering Information

Device	Package	Shipping
KSC9930	SOP-8 (Pb-free lead plating and halogen-free package)	4000 pcs / tape & reel

Absolute Maximum Ratings (TC=25°C, unless otherwise noted)

Parameter		Symbol	Limits		Unit
			N-channel	P-channel	
Drain-Source Breakdown Voltage		BVDSS	30	-30	V
Gate-Source Voltage		VGS	±25	±25	
Continuous Drain Current (Note 2)	TA=25 °C, VGS=10V (-10V)	ID	6	-4.4	A
	TA=70 °C, VGS=10V (-10V)		4.8	-3.5	
Pulsed Drain Current (Note 1)		IDM	24	-20	
Power Dissipation	TA=25°C	PD	1.38		W
	TA=70°C		0.88		
Operating Junction and Storage Temperature Range		Tj; Tstg	-55~+150		°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	RθJC	36	°C/W
Thermal Resistance, Junction-to-ambient, max	RθJA	90 (Note 2)	

Note : 1.Pulse width limited by maximum junction temperature.
2.Surface mounted on 1 in² copper pad of FR-4 board, pulse width≤10s.

N-Channel Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BVDSS	30	-	-	V	VGS=0V, ID=250μA
VGS(th)	1.0	-	2.5		VDS=VGS, ID=250μA
IGSS	-	-	±100	nA	VGS=±25V, VDS=0V
IDSS	-	-	1	μA	VDS=30V, VGS=0V
	-	-	25		VDS=24V, VGS=0V, Tj=70°C
*RDS(ON)	-	17	24	mΩ	ID=5A, VGS=10V
	-	21	30		ID=3A, VGS=4.5V
*GFS	-	6.7	-	S	VDS=5V, ID=5A
Dynamic					
Ciss	-	496	750	pF	VDS=25V, VGS=0V, f=1MHz
Coss	-	61	-		
Crss	-	47	-		
*td(ON)	-	6.2	-	ns	VDS=15V, ID=1A, VGS=10V, RG=6Ω
*tr	-	17.2	-		
*td(OFF)	-	30.2	-		
*tf	-	7.6	-		
*Qg	-	5.6	9	nC	VDS=15V, ID=6A, VGS=4.5V
*Qgs	-	1.9	-		
*Qgd	-	2.1	-		
Body Diode					
*VSD	-	0.78	1.2	V	VGS=0V, IS=1.2A
*trr	-	7.7	-	ns	IF=5A, dIF/dt=100A/μs
*Qrr	-	3.3	-	nC	

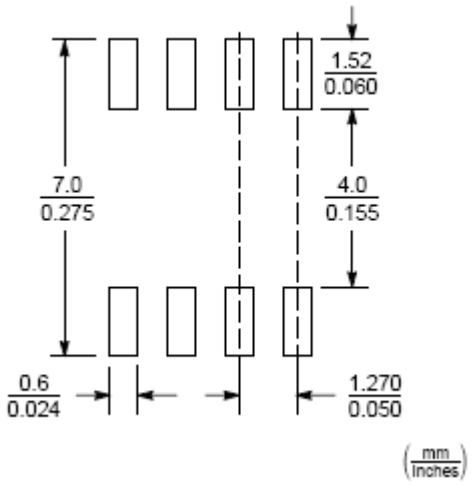
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

P-Channel Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-1.0	-	-2.5		V_{DS}=VGS, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±25V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-30V, V_{GS}=0V
	-	-	-25		V_{DS}=-24V, V_{GS}=0V, Tj=70°C
*$R_{DS(ON)}$	-	35	48	mΩ	I_D=-4A, V_{GS}=-10V
	-	46	70		I_D=-2A, V_{GS}=-4.5V
*G_{FS}	-	7.8	-	S	V_{DS}=-10V, I_D=-5A
Dynamic					
Ciss	-	597	900	pF	V_{DS}=-25V, V_{GS}=0V, f=1MHz
Coss	-	63	-		
Crss	-	51	-		
*$t_{d(ON)}$	-	5.6	-	ns	V_{DS}=-15V, I_D=-1A, V_{GS}=-10V, R_G=6Ω
*tr	-	17.6	-		
*$t_{d(OFF)}$	-	64.4	-		
*tf	-	33.8	-		
*Qg	-	6.7	11	nC	V_{DS}=-15V, I_D=-4.4A, V_{GS}=-4.5V
*Qgs	-	2.2	-		
*Qgd	-	2.5	-		
Body Diode					
*V_{SD}	-	-0.78	-1.2	V	V_{GS}=0V, Is=-1.2A
*trr	-	7.7	-	ns	I_F=-4.5A, dI_F/dt=100A/μs
*Qrr	-	3.0	-	nC	

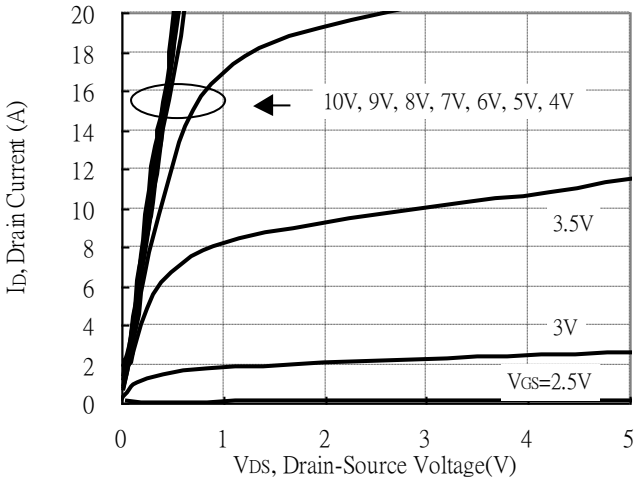
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

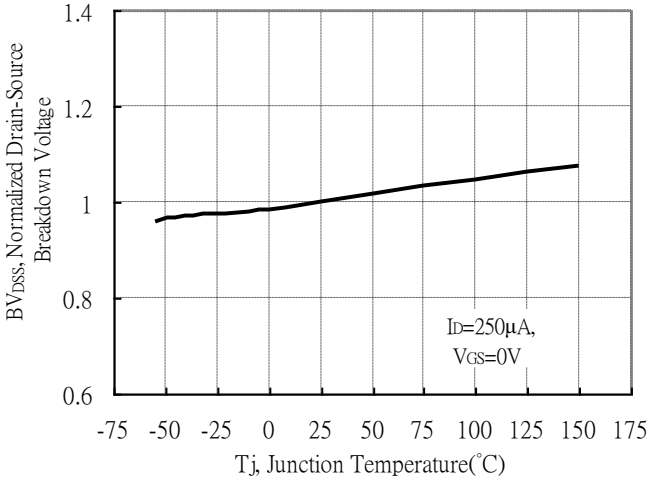


Typical Characteristics : Q1(N-channel)

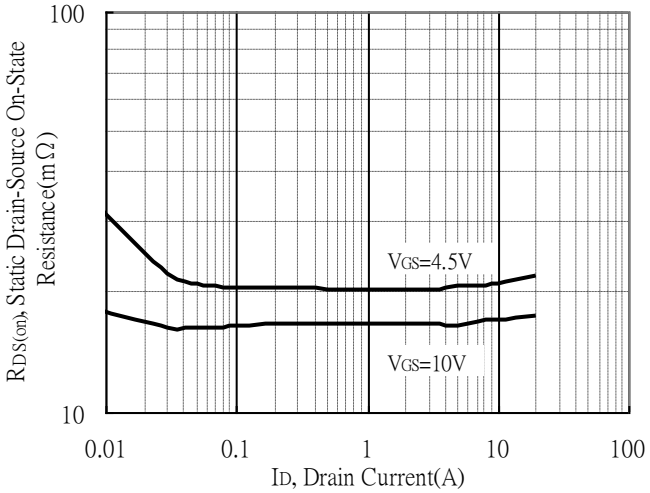
Typical Output Characteristics



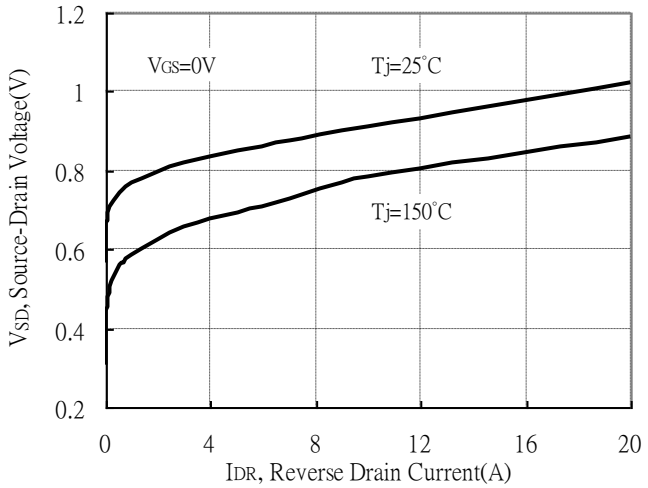
Brekdown Voltage vs Ambient Temperature



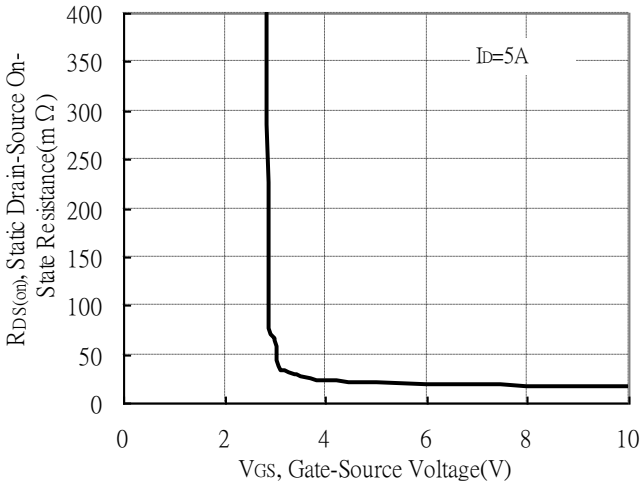
Static Drain-Source On-State resistance vs Drain Current



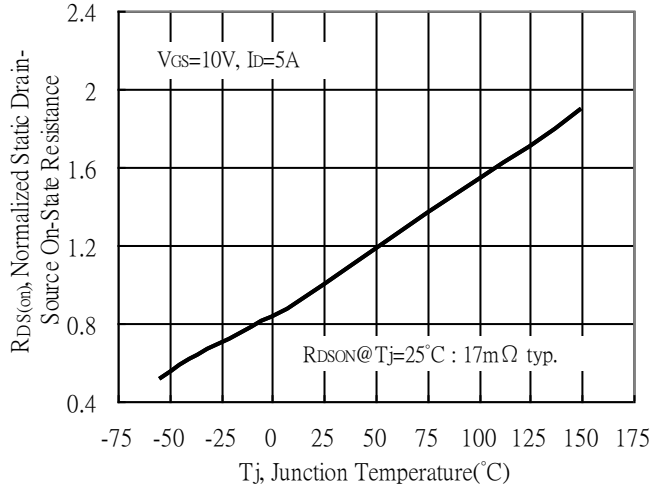
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

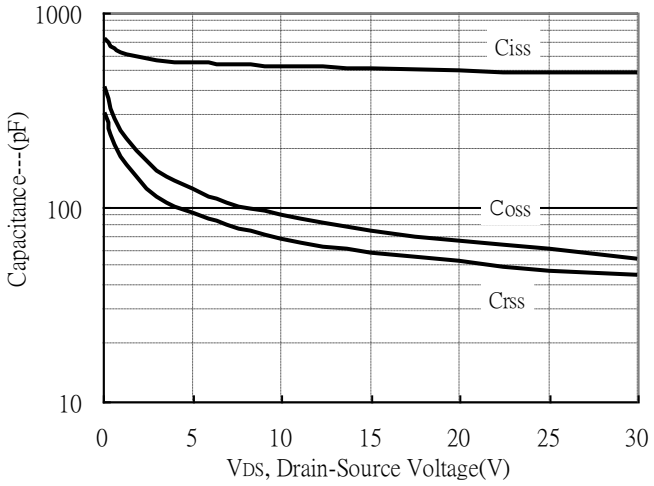


Drain-Source On-State Resistance vs Junction Tempearture

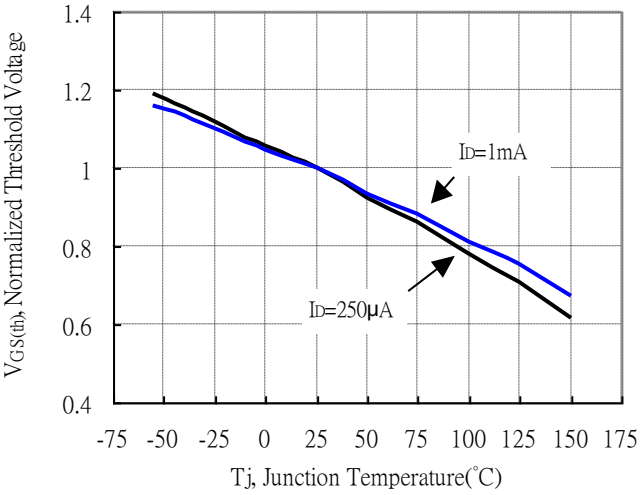


Typical Characteristics(Cont.) : Q1(N-channel)

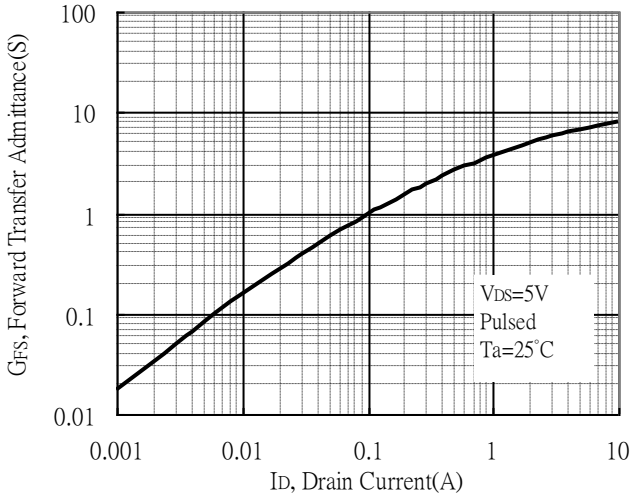
Capacitance vs Drain-to-Source Voltage



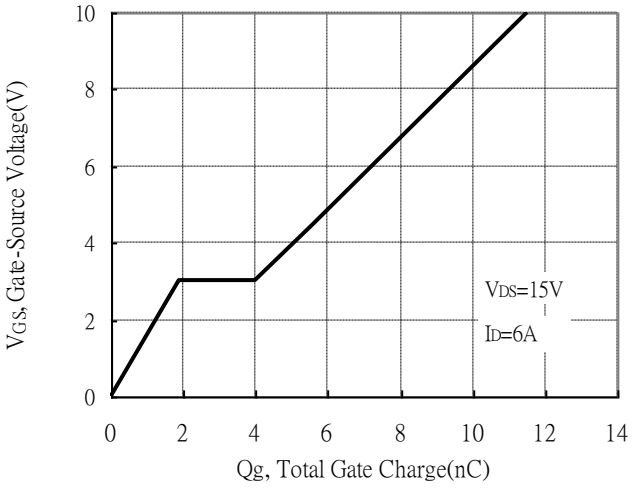
Threshold Voltage vs Junction Tempearture



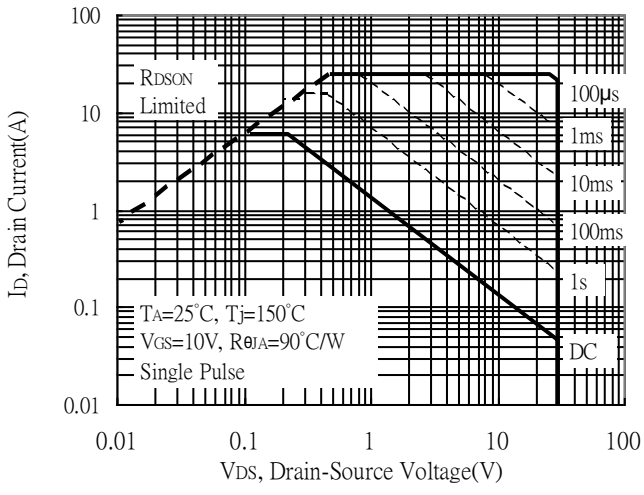
Forward Transfer Admittance vs Drain Current



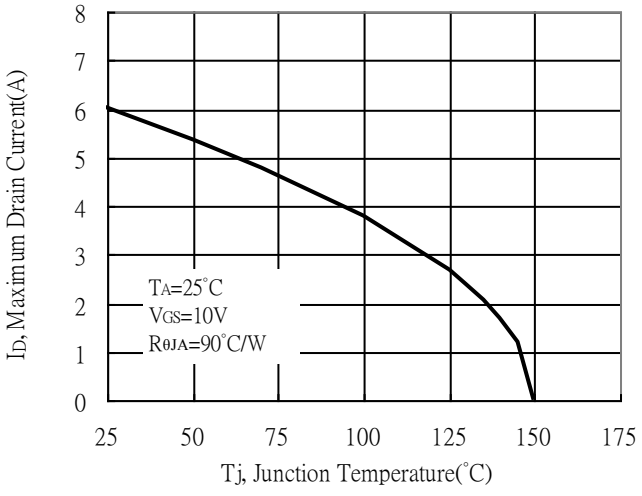
Gate Charge Characteristics



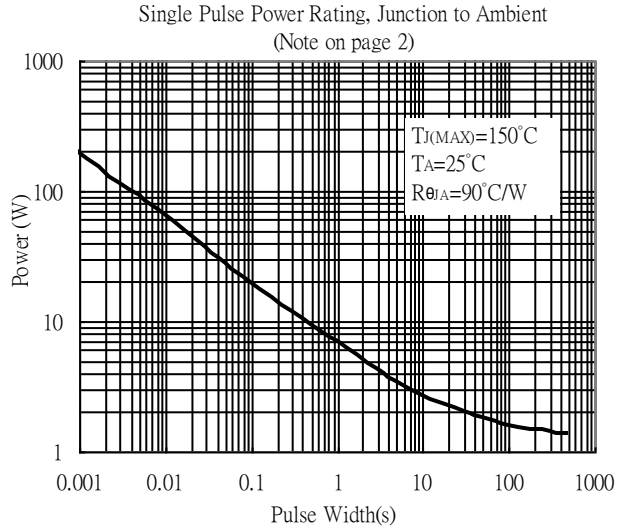
Maximum Safe Operating Area

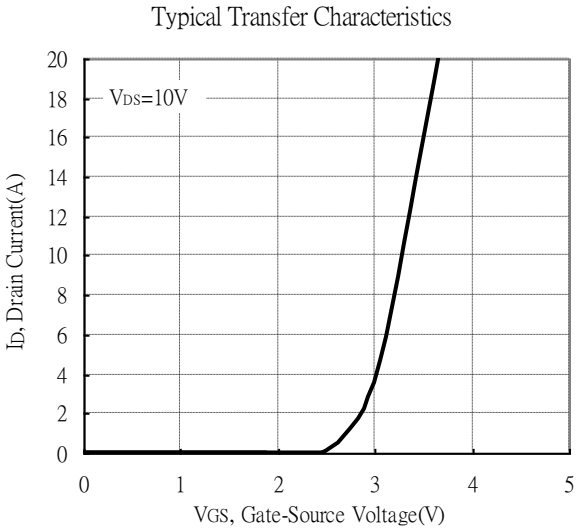


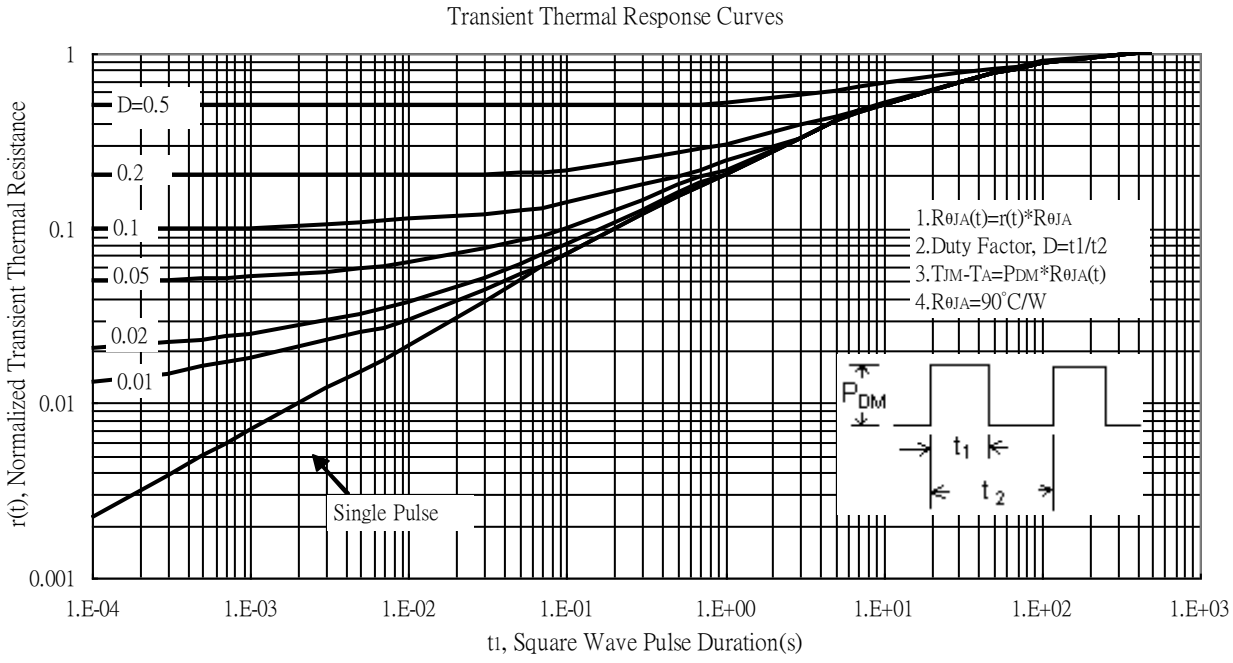
Maximum Drain Current vs Junction Temperature



Typical Characteristics(Cont.) : Q1(N-channel)

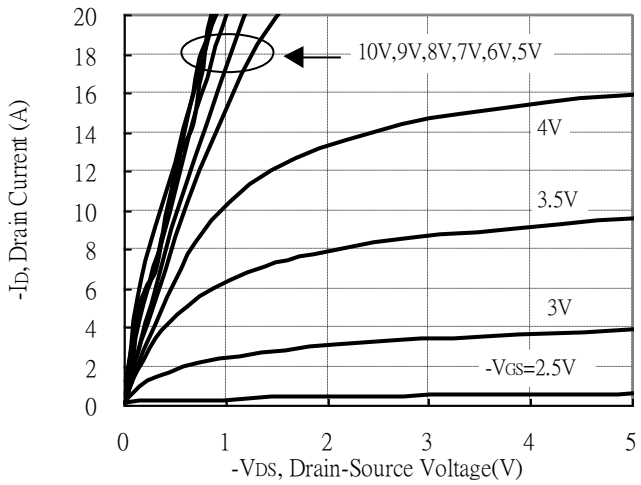




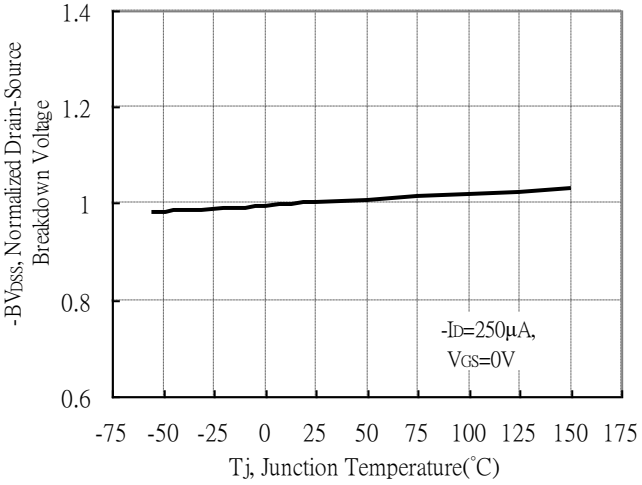


Typical Characteristics : Q2(P-channel)

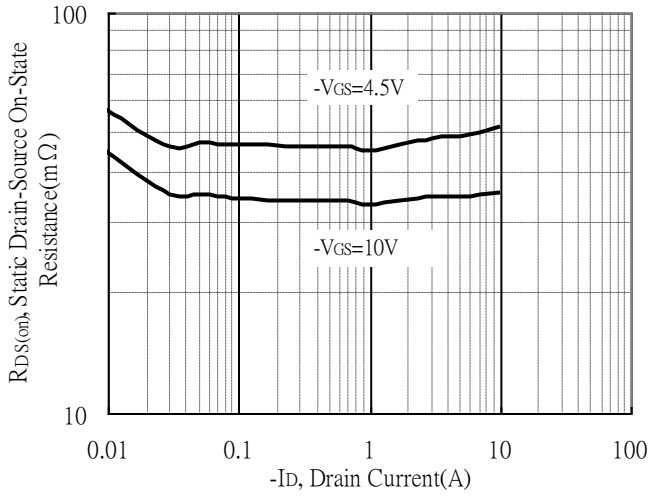
Typical Output Characteristics



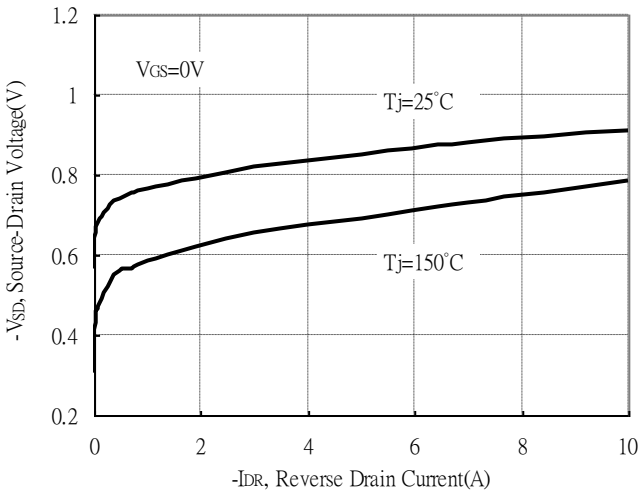
Brekdown Voltage vs Ambient Temperature



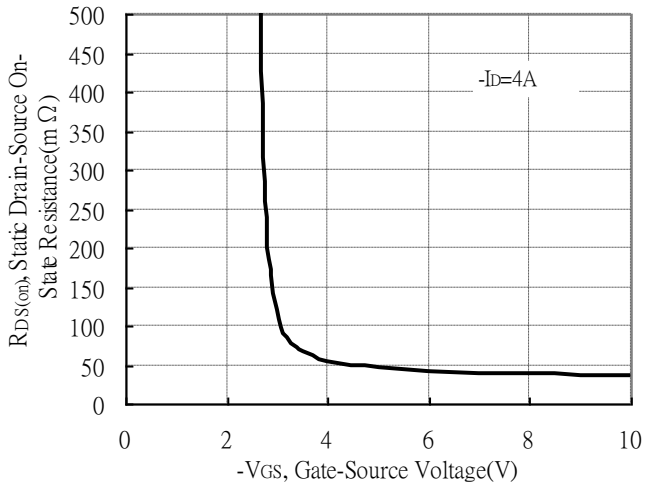
Static Drain-Source On-State resistance vs Drain Current



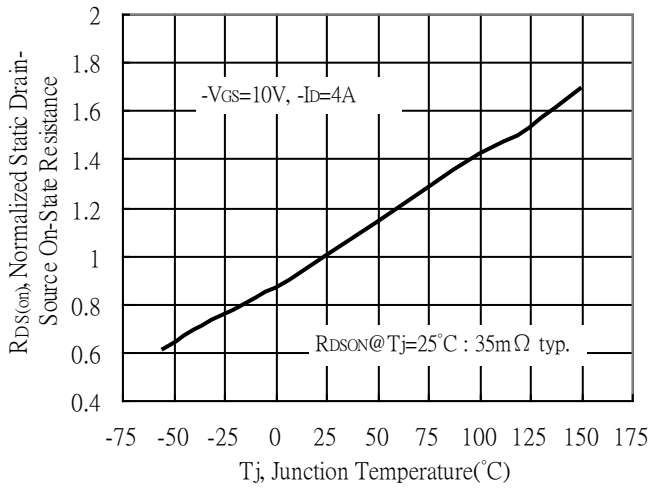
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

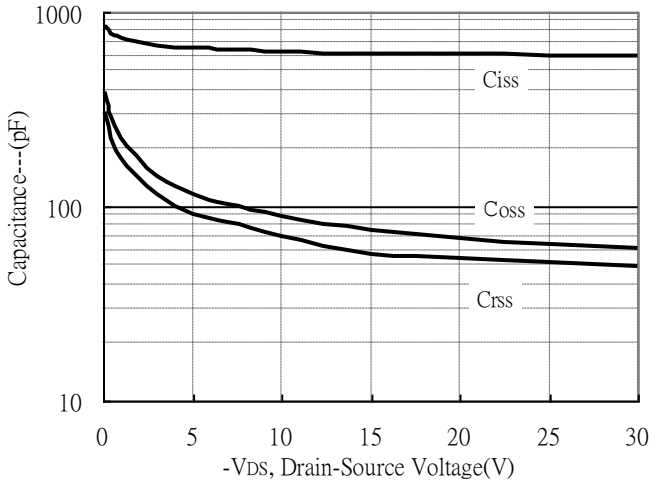


Drain-Source On-State Resistance vs Junction Tempearture

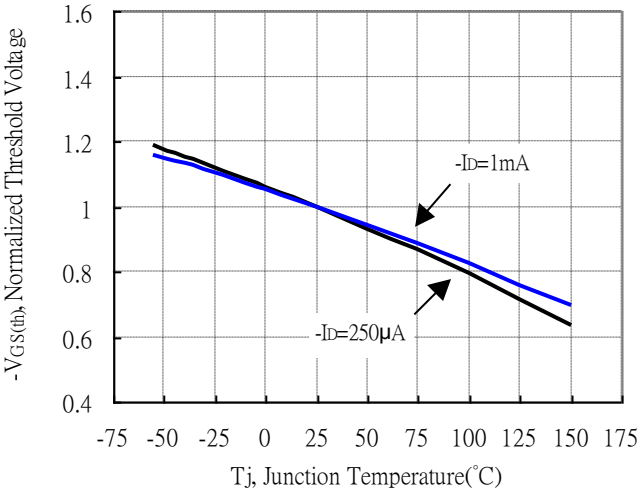


Typical Characteristics(Cont.) : Q2(P-channel)

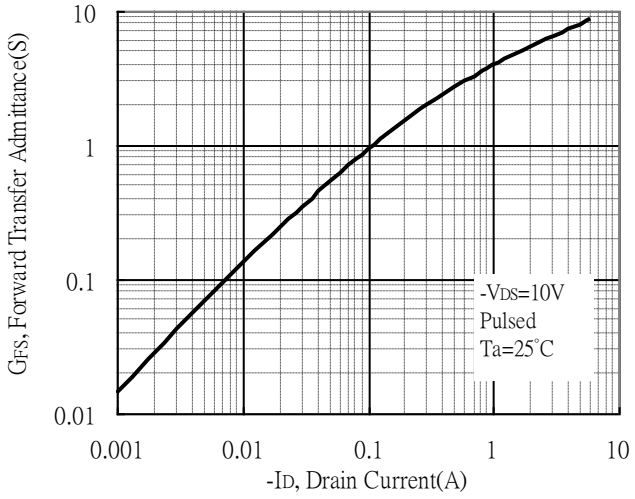
Capacitance vs Drain-to-Source Voltage



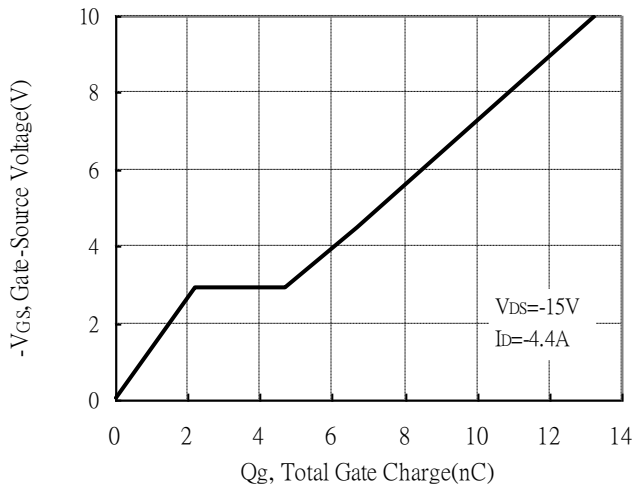
Threshold Voltage vs Junction Tempearture



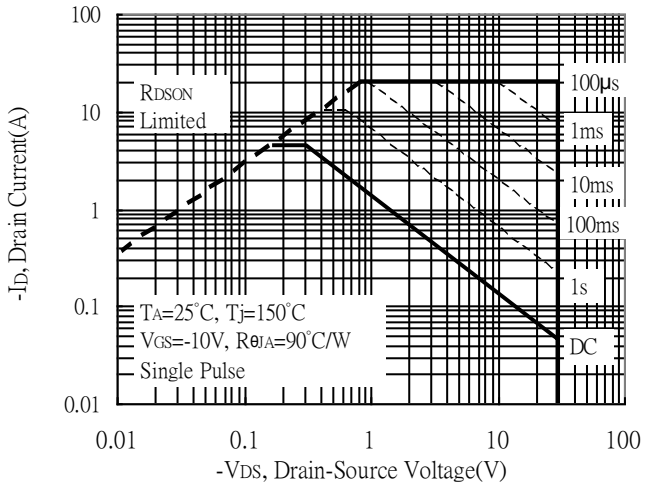
Forward Transfer Admittance vs Drain Current



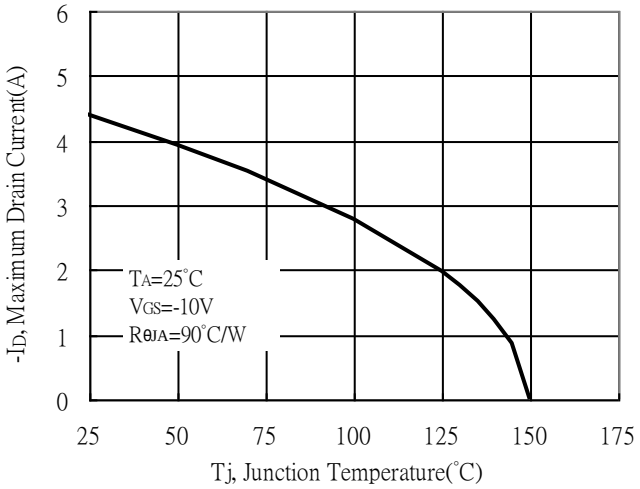
Gate Charge Characteristics



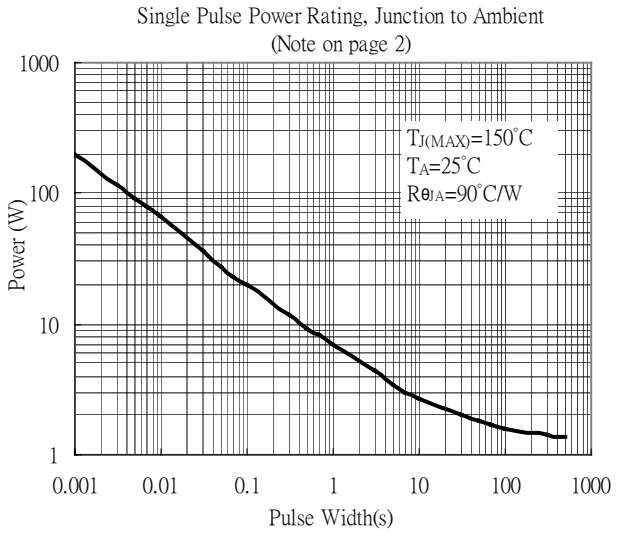
Maximum Safe Operating Area

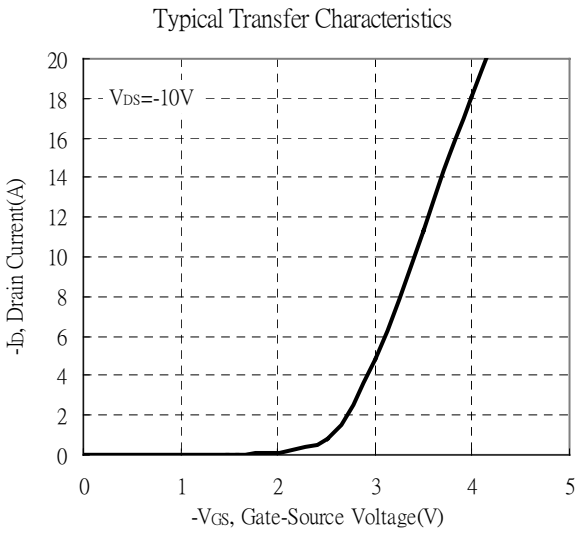


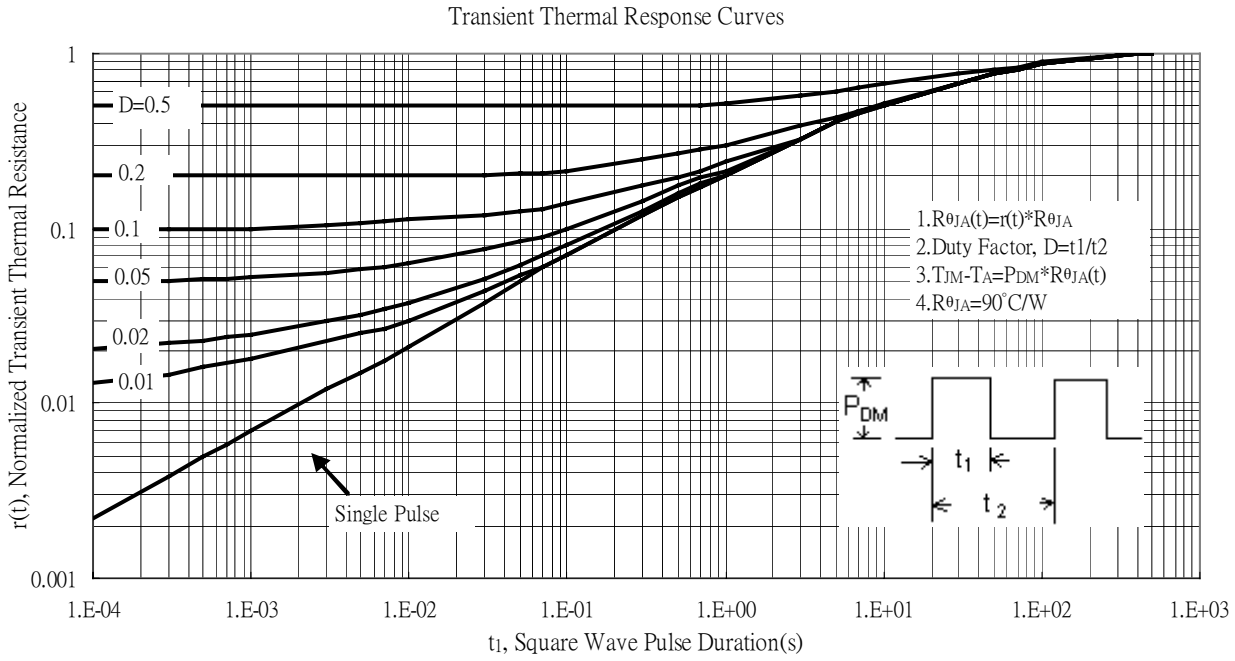
Maximum Drain Current vs Junction Temperature



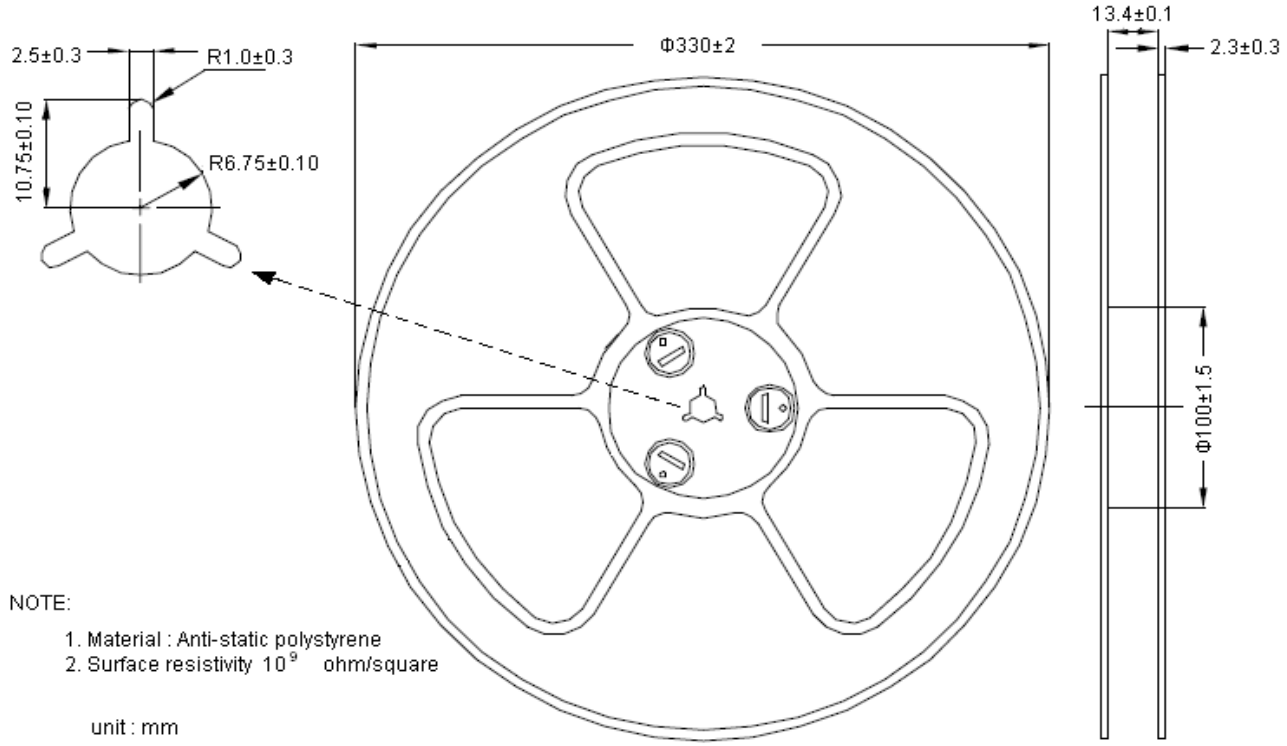
Typical Characteristics(Cont.) : Q2(P-channel)







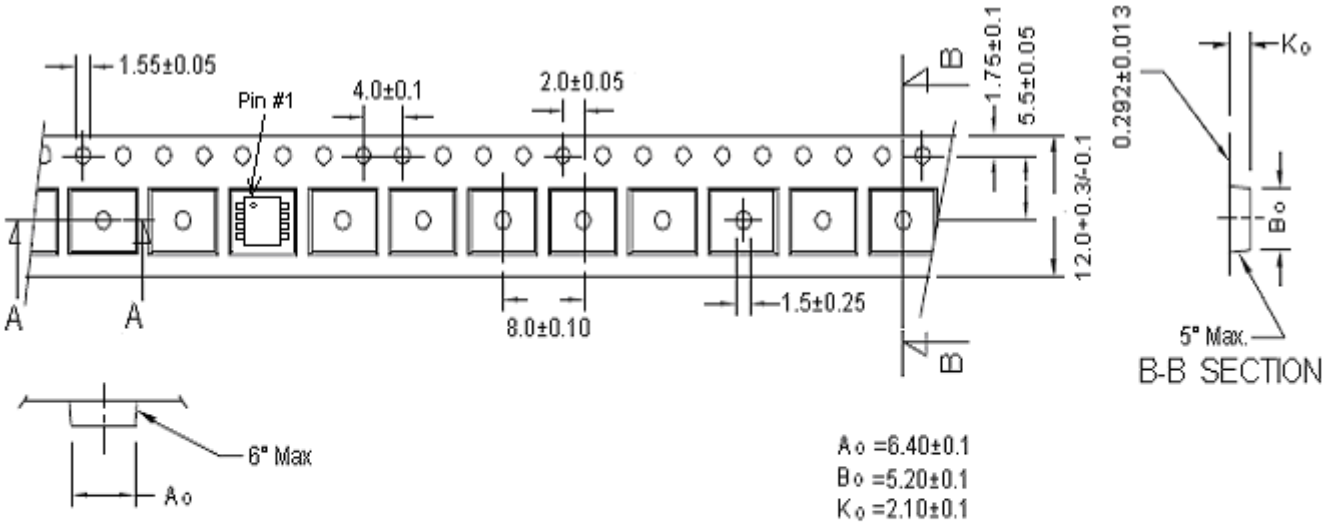
Reel Dimension



NOTE:
1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 ohm/square

unit : mm

Carrier Tape Dimension

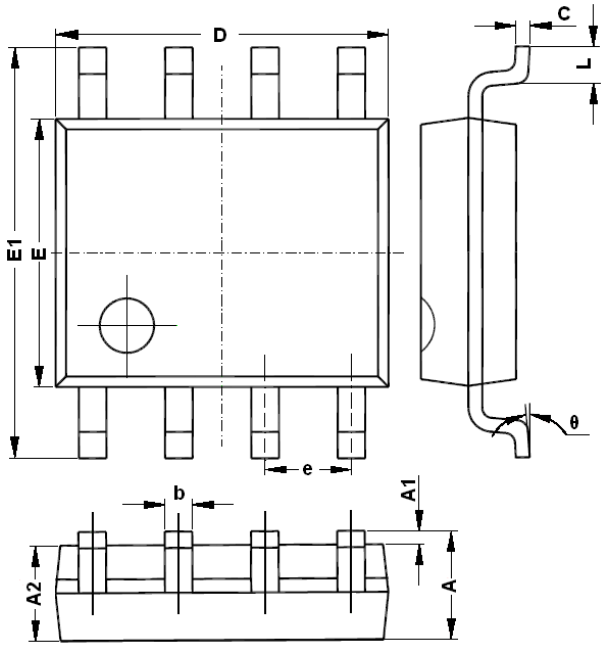


Ao =6.40±0.1
Bo =5.20±0.1
Ko =2.10±0.1

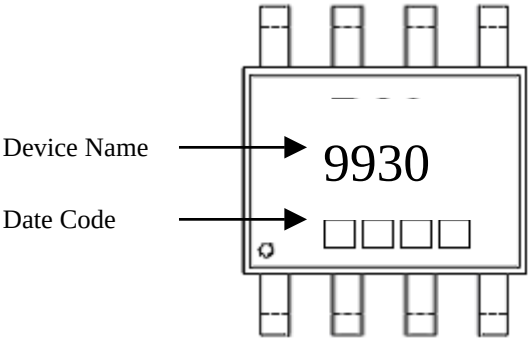
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Uni : millimeter

SOP-8 Dimension



Marking:



Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D
May→E, Jun→F, Jul→G, Aug→H, Sep→J,
Oct→K, Nov→L, Dec→M
3rd and 4th codes : prodcution serial number, 01~99

8-Lead SOP-8 Plastic Package

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	θ	0	8°	0	8°
D	4.700	5.100	0.185	0.200					