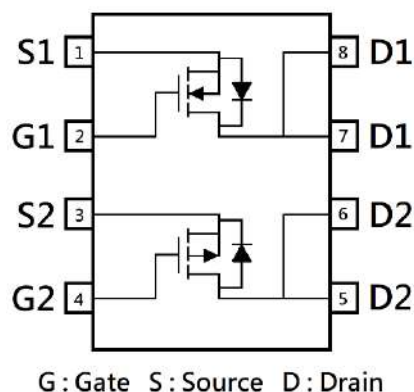


N- AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

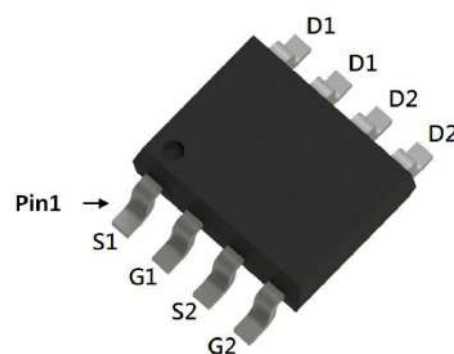
Features

- Simple drive requirement
- Low On Resistance
- Fast switching speed
- RoHS compliant package



SOP-8

	N-CH	P-CH
BV_{DSS}	60V	-60V
$I_D@V_{GS}=(-)10V, T_C=25^{\circ}C$	11.4A	-8.2A
$I_D@V_{GS}=(-)10V, T_A=25^{\circ}C$	4.7A	-3.4A
$R_{DS(ON)}@V_{GS}=(-)10V$	28m Ω	60m Ω
$R_{DS(ON)}@V_{GS}=(-)4.5V$	33m Ω	70m Ω



Ordering Information

Device	Package	Shipping
KSCC4506	SOP-8 (RoHS compliant & Halogen-free package)	4000 pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Limits		Unit
			N-CH	P-CH	
Drain-Source Voltage		V _{DS}	60	-60	V
Gate-Source Voltage		V _{GS}	±20	±20	
Continuous Drain Current @ V _{GS} =10V, T _C =25°C		I _D	11.4	-8.2	A
Continuous Drain Current @ V _{GS} =10V, T _C =100°C			7.2	-5.2	
Continuous Drain Current @ V _{GS} =10V, T _A =25°C			4.7	-3.4	
Continuous Drain Current @ V _{GS} =10V, T _A =70°C			3.8	-2.7	
Pulsed Drain Current		I _{DM}	28	-28	
Continuous Body Diode Forward Current @ T _C =25°C		I _S	7	-7	
Pulsed Body Diode Forward Current @ T _C =25°C		I _{SM}	28	-28	
Avalanche Current @ L=0.1mH		I _{AS}	14	-14	mJ
Avalanche Energy @ L=0.5mH		E _{AS}	16	16	
Total Power Dissipation	T _C =25°C	P _D	9.6		W
	T _C =100°C		3.8		
	T _A =25°C		1.7		
	T _A =70°C		1.1		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55~+150		°C

Thermal Data

Parameter	Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case	R _{θJC}	13	°C/W
Thermal Resistance, Junction-to-ambient	R _{θJA}	75	

Note:

- *a. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- *b. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- *c. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	60	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1.2	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	10	-	S	V _{DS} =5V, I _D =4A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =48V, V _{GS} =0V
R _{DS(ON)}	-	28	36	mΩ	V _{GS} =10V, I _D =4A
	-	33	46		V _{GS} =4.5V, I _D =4A
Dynamic					
C _{iss}	-	1000	-	pF	V _{DS} =30V, V _{GS} =0V, f=1MHz
C _{oss}	-	60	-		
C _{rss}	-	50	-		
R _g	-	8	-	Ω	f=1MHz
Q _g *1, 2	-	11.3	-	nC	V _{DS} =30V, I _D =4A, V _{GS} =4.5V
Q _g *1, 2	-	23	-		V _{DS} =30V, I _D =4A, V _{GS} =10V
Q _{gs} *1, 2	-	2.9	-		
Q _{gd} *1, 2	-	4.7	-		
t _{d(ON)} *1, 2	-	7.7	-	ns	V _{DS} =30V, I _D =4A, V _{GS} =10V, R _{GS} =6Ω
t _r *1, 2	-	16	-		
t _{d(OFF)} *1, 2	-	61	-		
t _f *1, 2	-	12	-		
Source-Drain Diode					
V _{SD} *1	-	0.8	1.2	V	I _S =4A, V _{GS} =0V
t _{rr}	-	12.5	-	ns	I _F =4A, dI _F /dt=100A/μs
Q _{rr}	-	9	-	nC	

Note:

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

*2. Independent of operating temperature

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-60	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-1.2	-	-2.5		V _{DS} =V _{GS} , I _D =-250μA
G _{FS}	-	9	-	S	V _{DS} =-5V, I _D =-4A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-48V, V _{GS} =0V
R _{DS(ON)}	-	60	78	mΩ	V _{GS} =-10V, I _D =-4A
	-	70	98		V _{GS} =-4.5V, I _D =-4A
Dynamic					
C _{iss}	-	1400	-	pF	V _{DS} =-30V, V _{GS} =0V, f=1MHz
C _{oss}	-	65	-		
C _{rss}	-	50	-		
R _g	-	24	-	Ω	f=1MHz
Q _g *1, 2	-	12	-	nC	V _{DS} =-30V, I _D =-4A, V _{GS} =-4.5V
Q _g *1, 2	-	25	-		V _{DS} =-30V, I _D =-4A, V _{GS} =-10V
Q _{gs} *1, 2	-	3.7	-		
Q _{gd} *1, 2	-	4	-		
t _{d(ON)} *1, 2	-	7	-	ns	V _{DS} =-30V, I _D =-4A, V _{GS} =-10V, R _{GS} =6Ω
t _r *1, 2	-	22	-		
t _{d(OFF)} *1, 2	-	120	-		
t _f *1, 2	-	50	-		
Source-Drain Diode					
V _{SD} *1	-	-0.83	-1.2	V	I _S =-4A, V _{GS} =0V
t _{rr}	-	12	-	ns	I _F =-4A, dI _F /dt=100A/μs
Q _{rr}	-	8	-	nC	

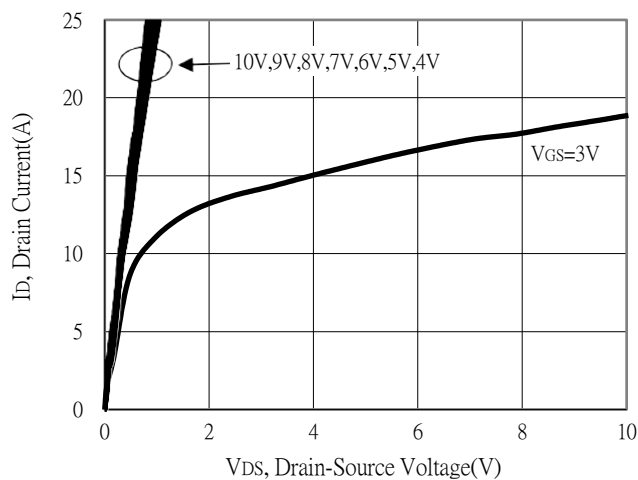
Note:

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

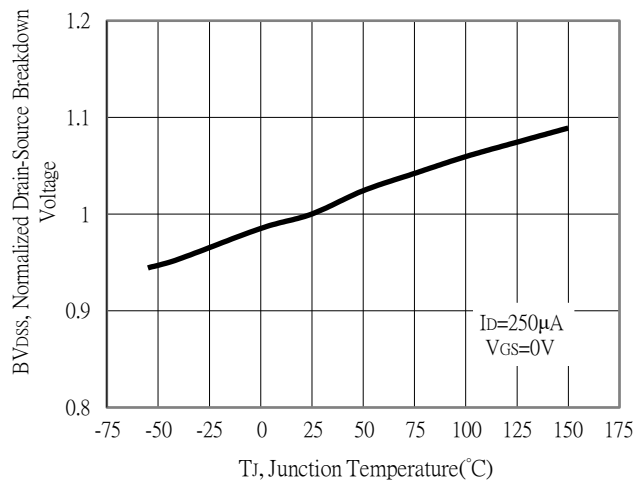
*2. Independent of operating temperature

Typical Characteristics : Q1(N-channel)

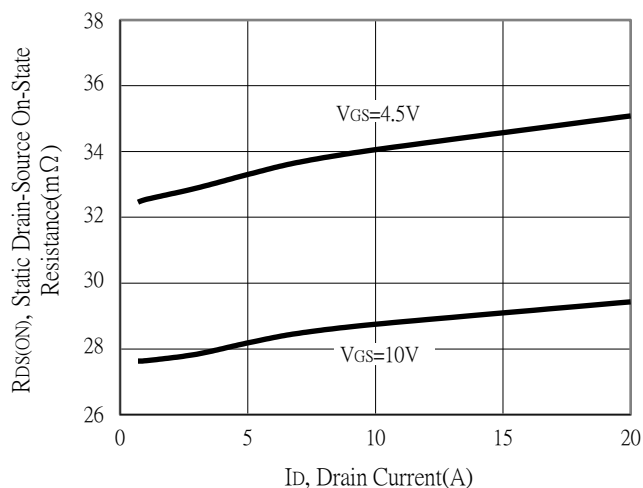
Typical Output Characteristics



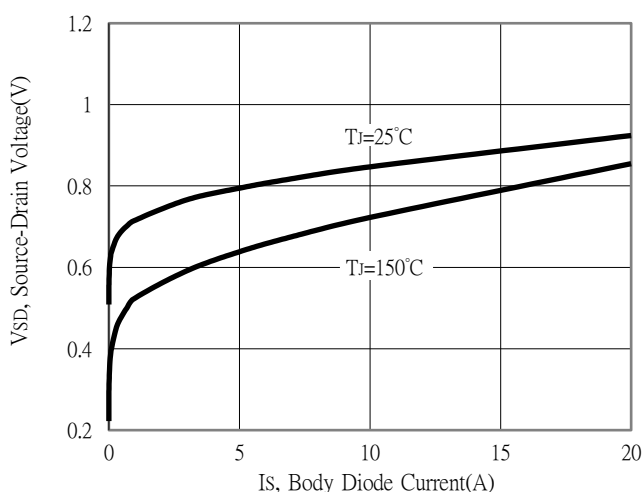
Breakdown Voltage vs Ambient Temperature



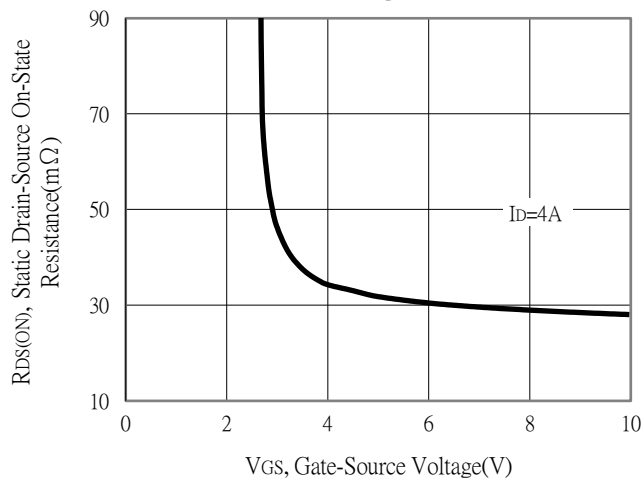
Static Drain-Source On-State resistance vs Drain Current



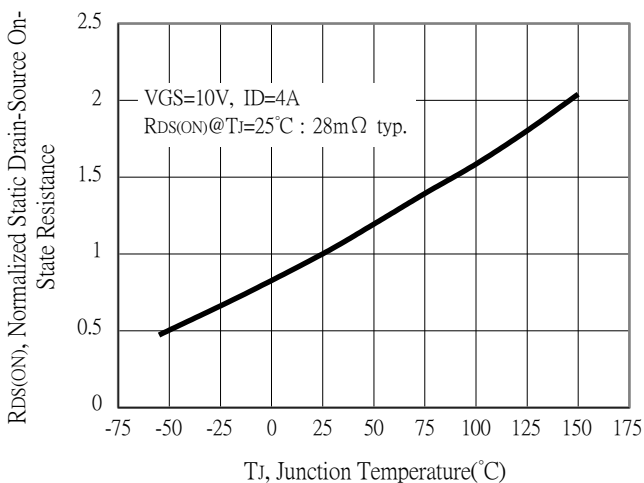
Body Diode Current vs Source-Drain Voltage



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

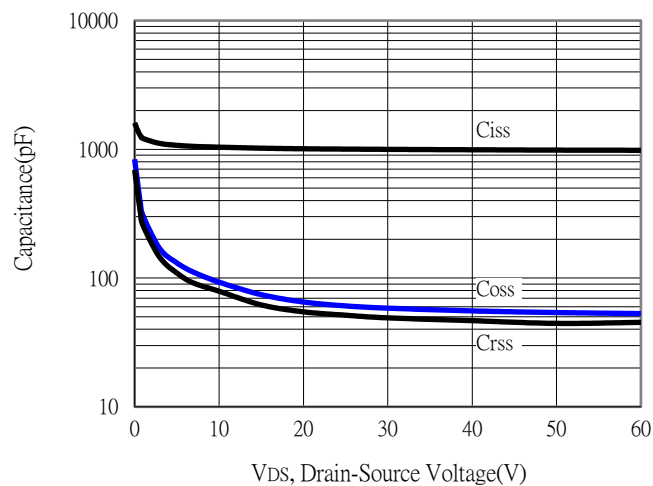


Drain-Source On-State Resistance vs Junction Temperature

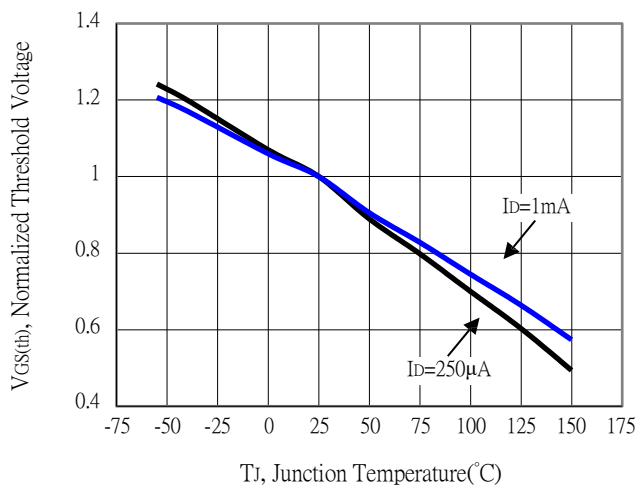


Typical Characteristics (Cont.) : Q1(N-channel)

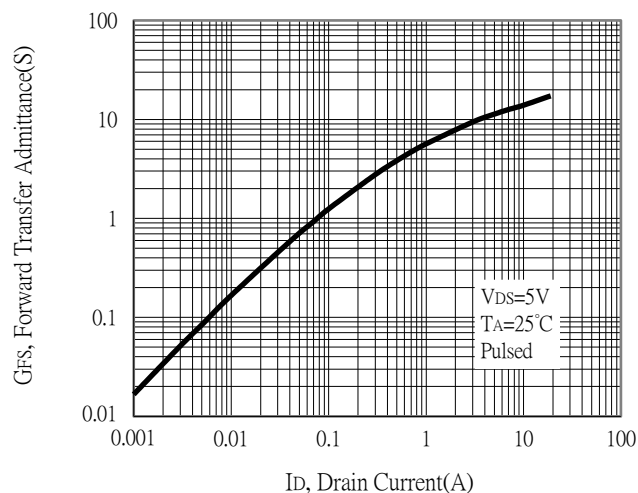
Capacitance vs Drain-to-Source Voltage



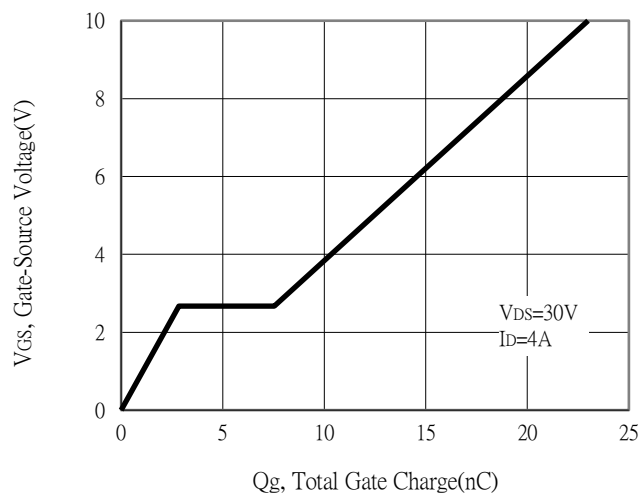
Threshold Voltage vs Junction Temperature



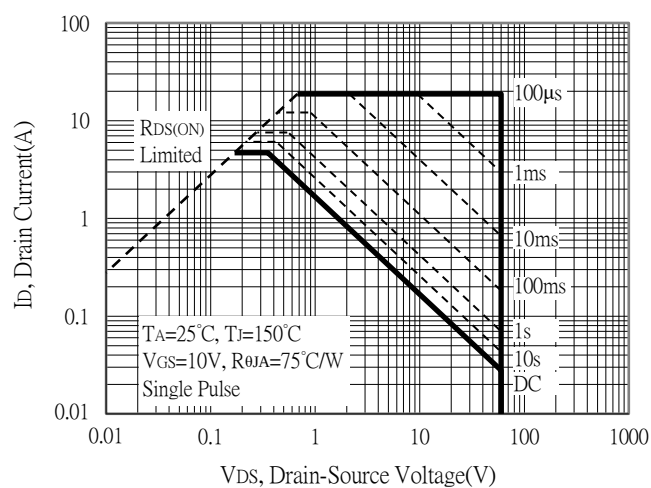
Forward Transfer Admittance vs Drain Current



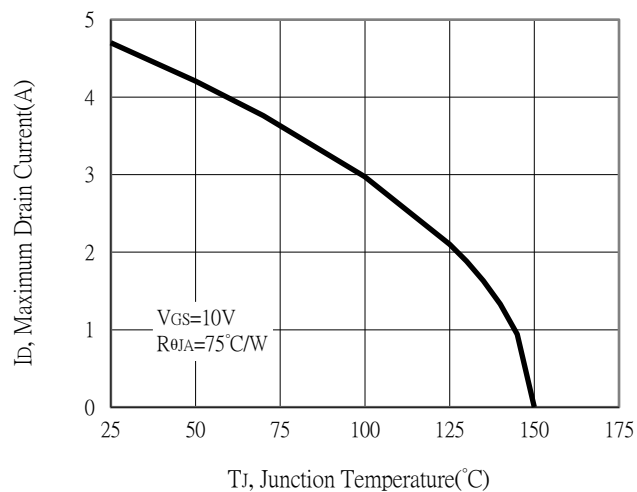
Gate Charge Characteristics



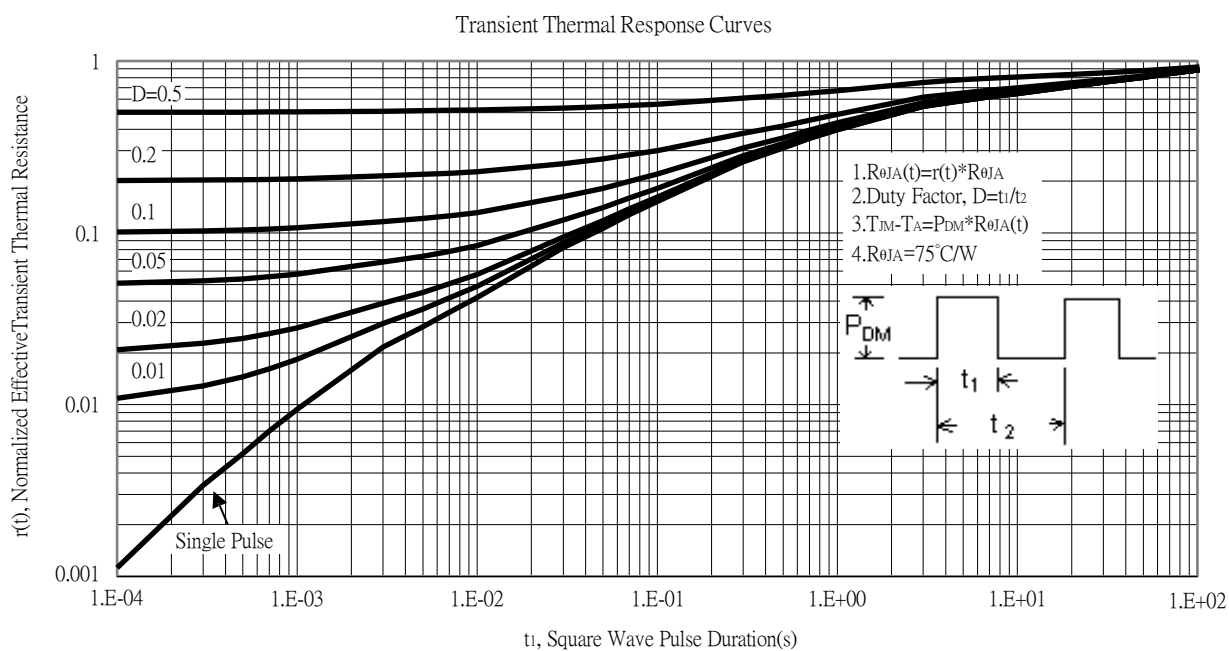
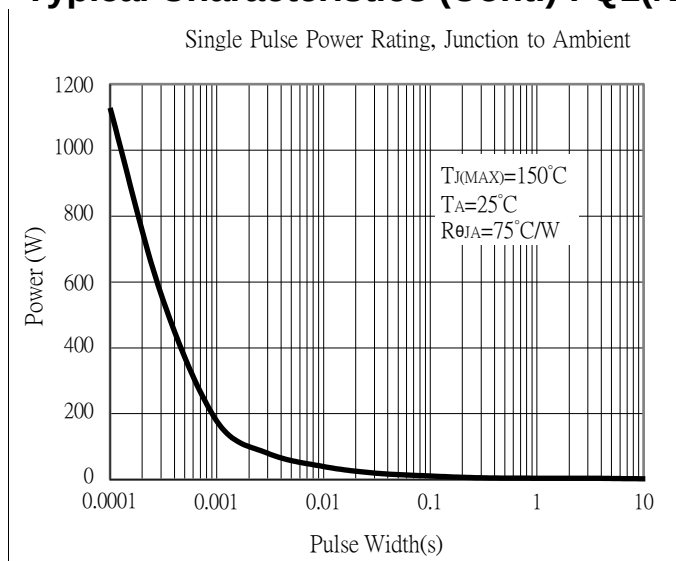
Maximum Safe Operating Area



Maximum Drain Current vs Junction Temperature

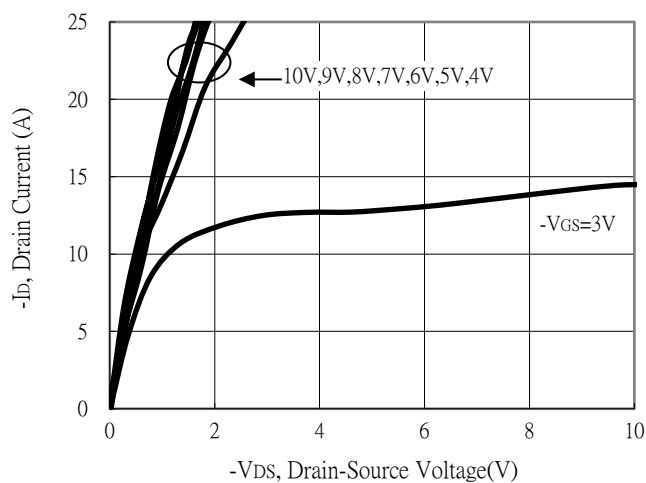


Typical Characteristics (Cont.) : Q1(N-channel)

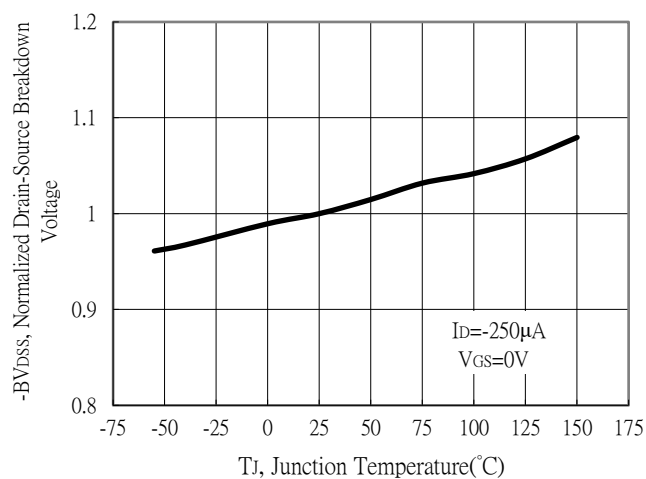


Typical Characteristics : Q2(P-channel)

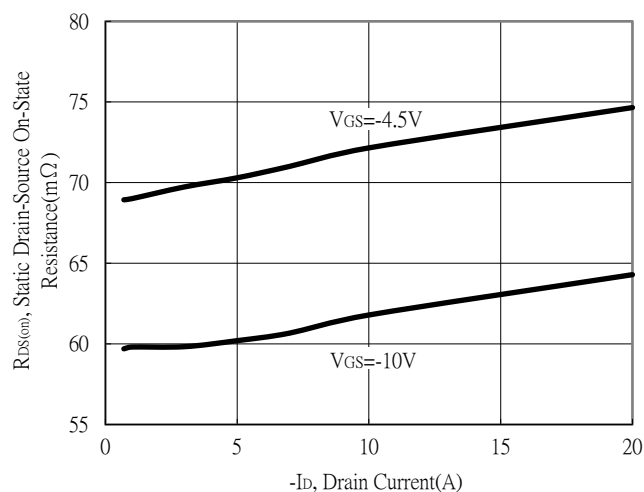
Typical Output Characteristics



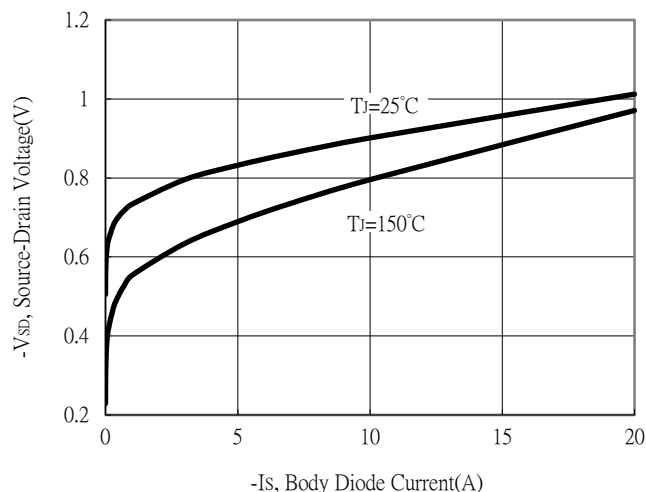
Breakdown Voltage vs Ambient Temperature



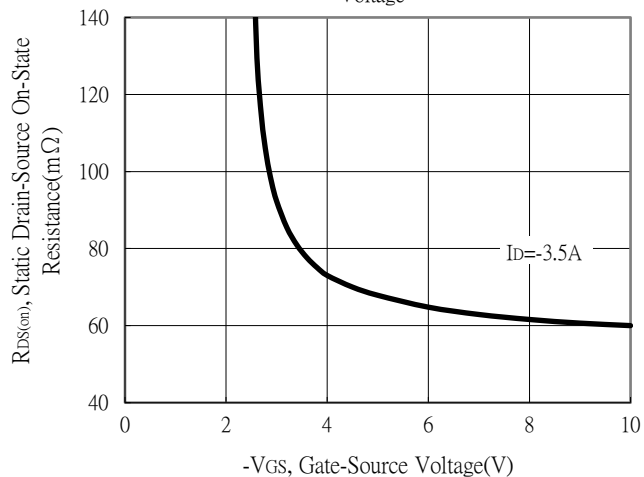
Static Drain-Source On-State resistance vs Drain Current



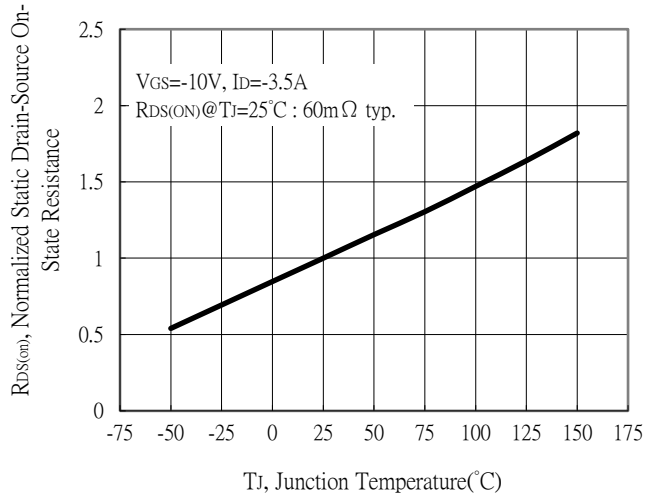
Body Diode Current vs Source-Drain Voltage



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

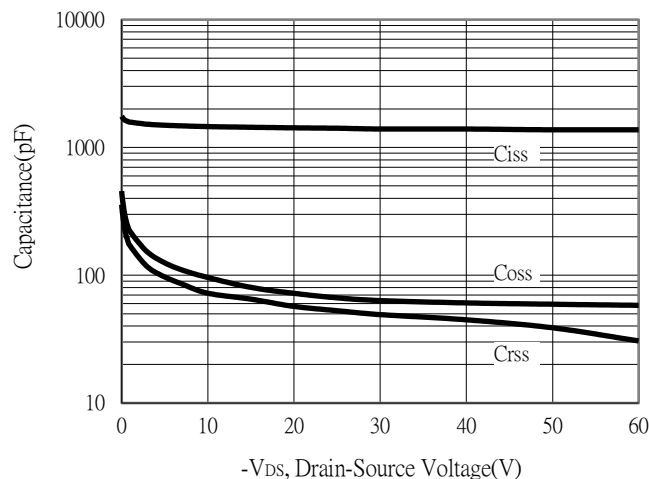


Drain-Source On-State Resistance vs Junction Temperature

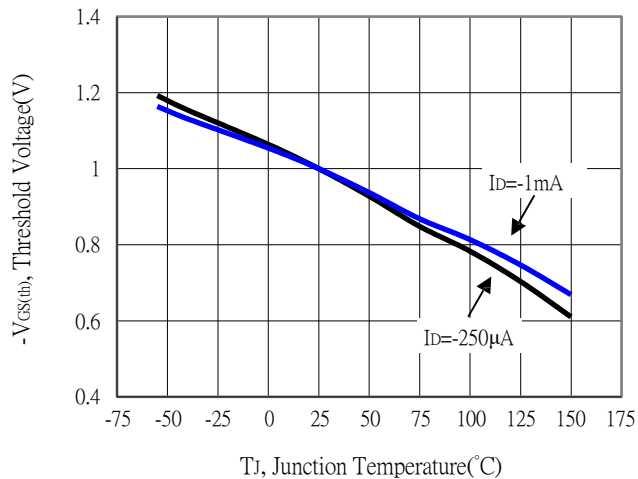


Typical Characteristics (Cont.) : Q2(P-channel)

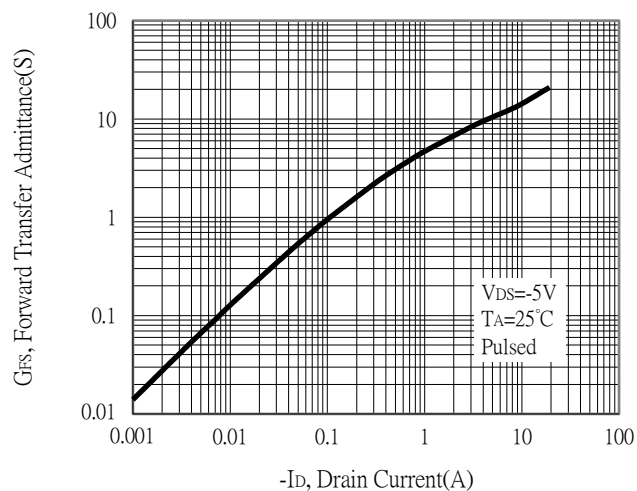
Capacitance vs Drain-to-Source Voltage



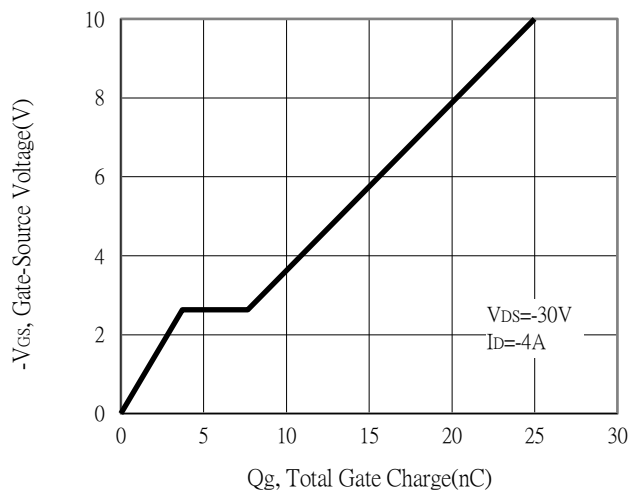
Threshold Voltage vs Junction Temperature



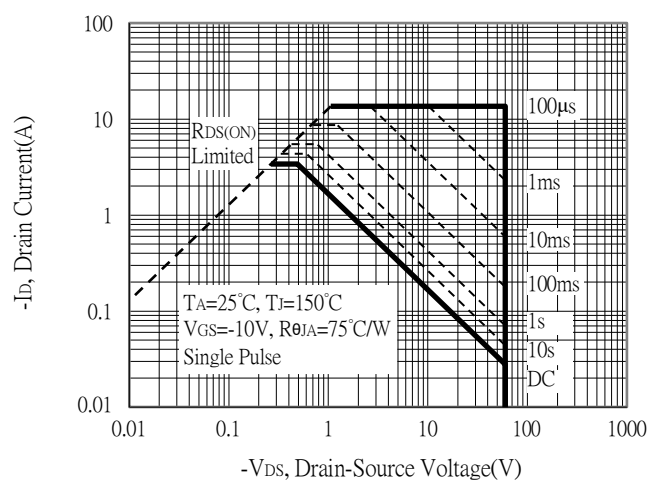
Forward Transfer Admittance vs Drain Current



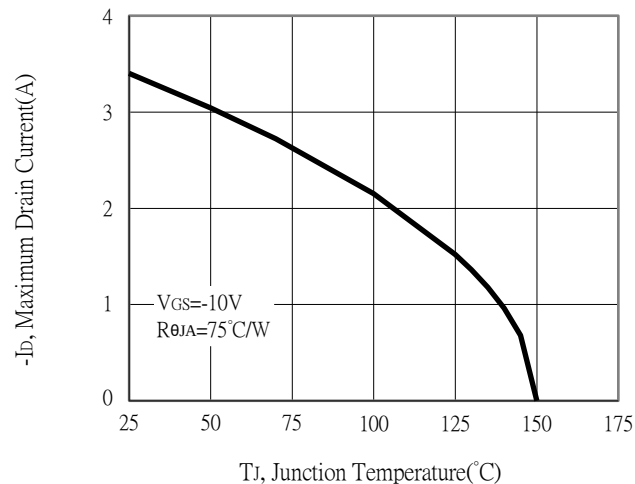
Gate Charge Characteristics



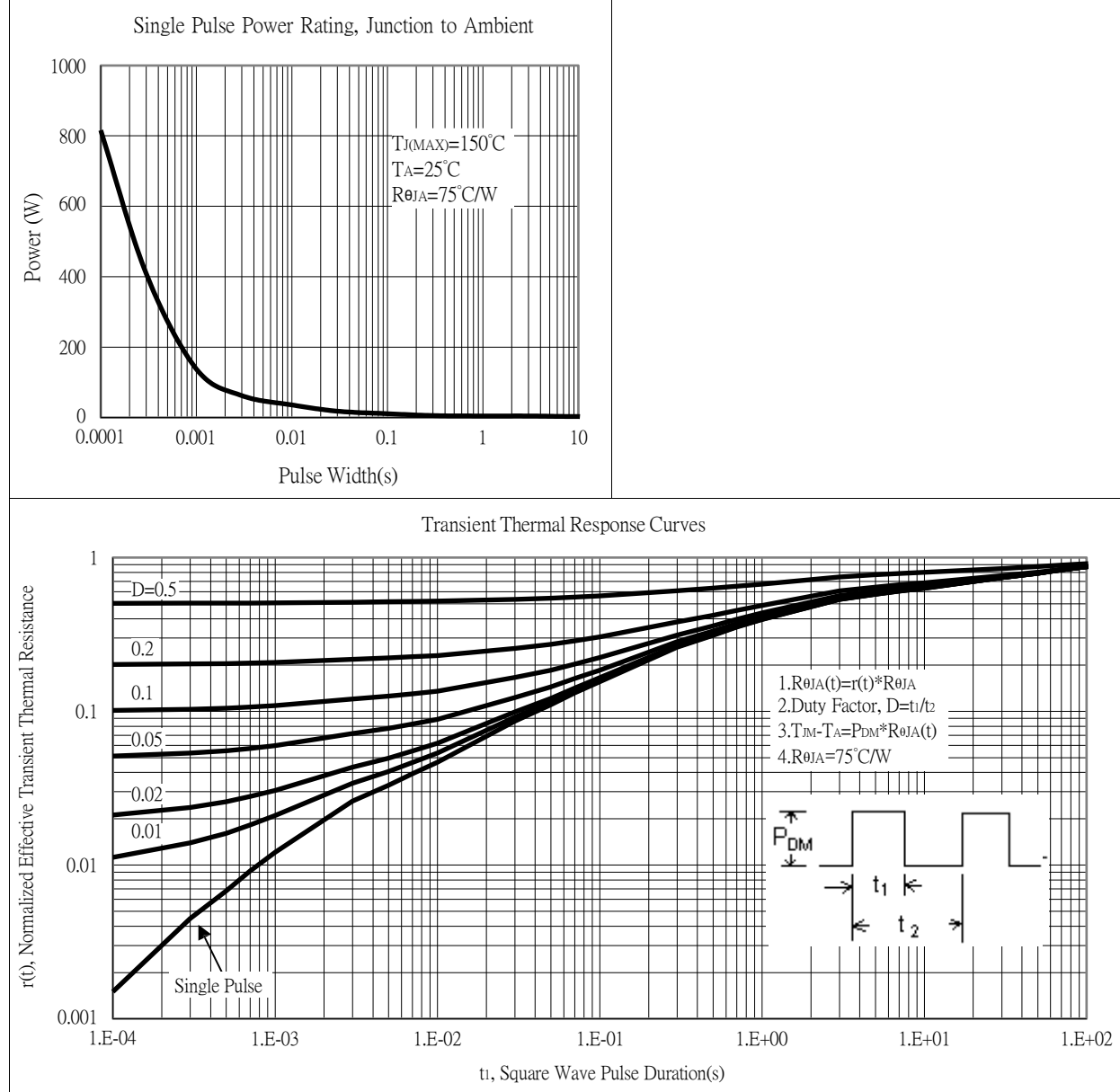
Maximum Safe Operating Area



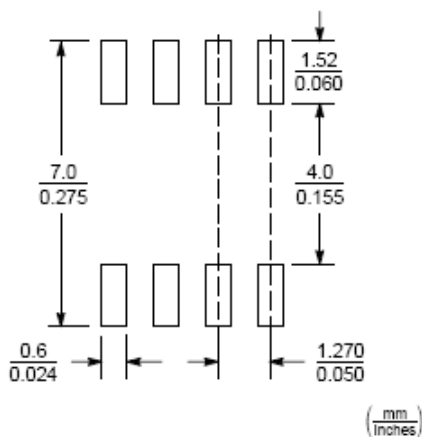
Maximum Drain Current vs Junction Temperature



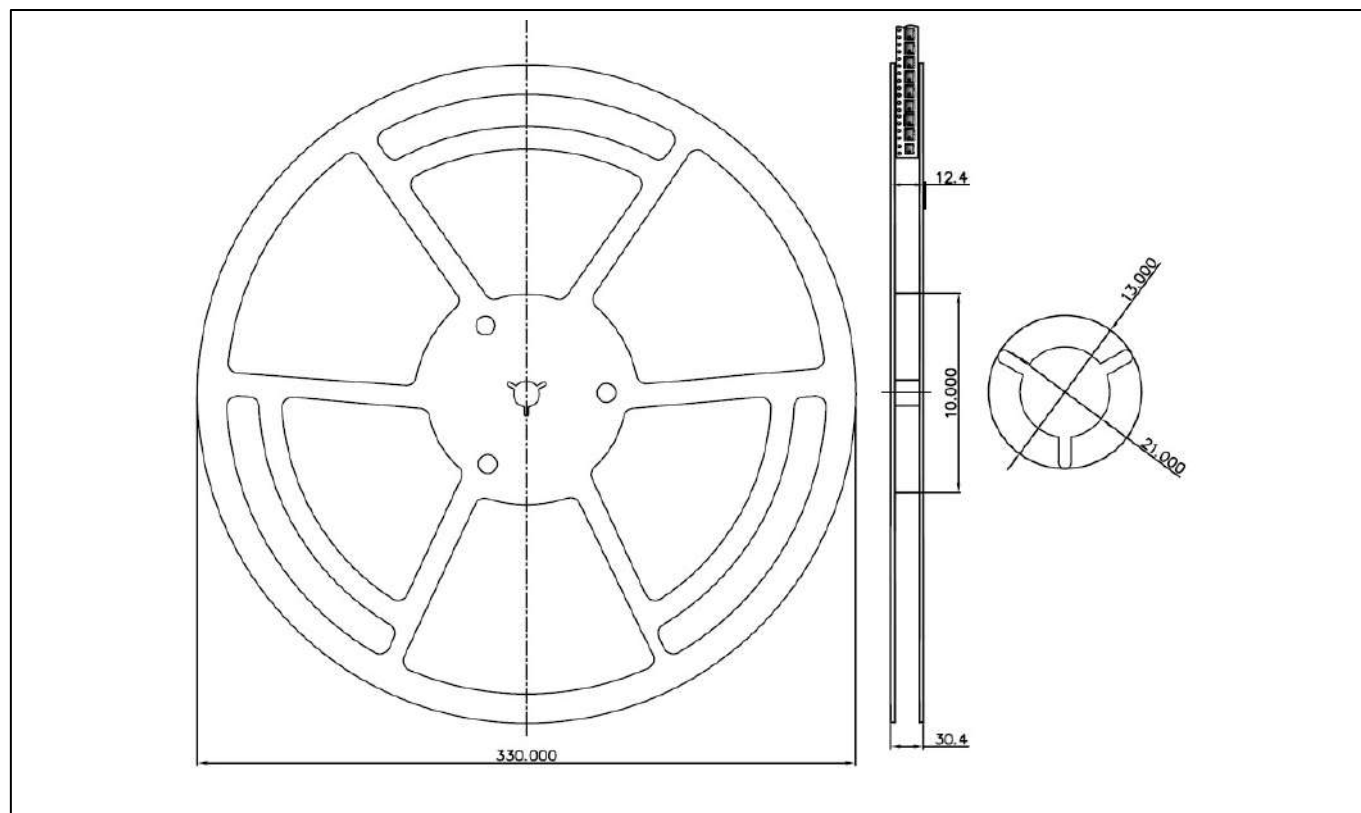
Typical Characteristics (Cont.) : Q2(P-channel)



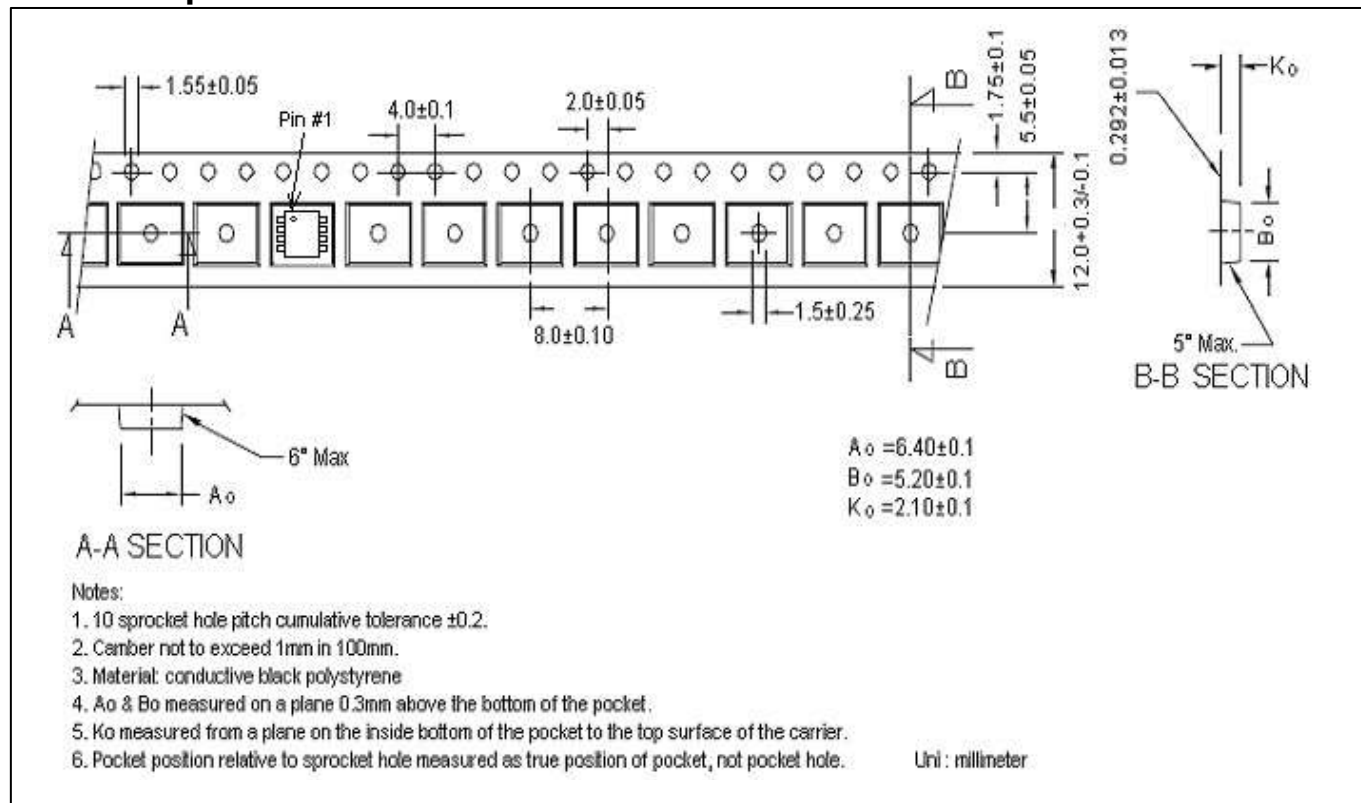
Recommended Soldering Footprint



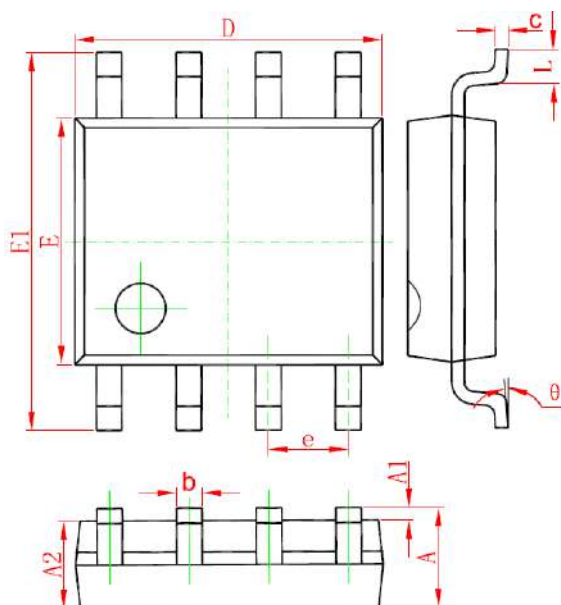
Reel Dimension



Carrier Tape Dimension

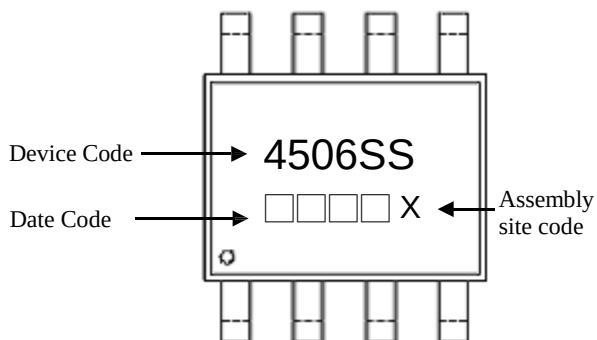


SOP-8 Dimension



8-Lead SOP-8 Plastic Package

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 : production serial number, 01~99

Assembly site code : blank→ site 1, G →site 2

*: Typical

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		*0.050	
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					