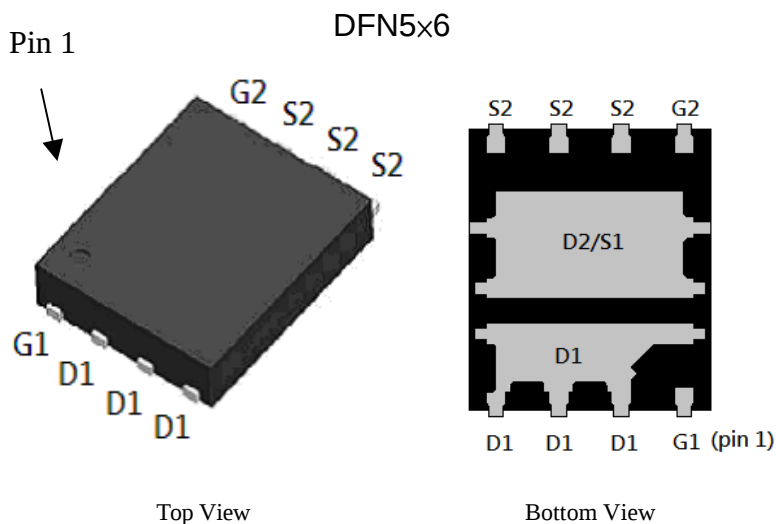


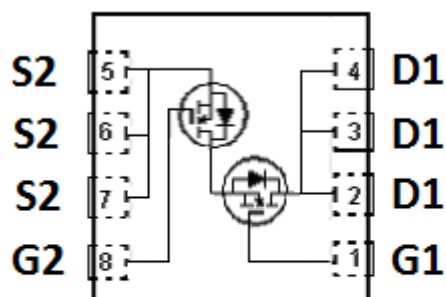
Asymmetric Dual N- Channel Enhancement Mode MOSFET

Features:

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



	Tr 1	Tr 2
B _V D _{SS}	30V	30V
I _D @V _{GS} =10V, T _A =25°C	11.9A	14.9A
I _D @V _{GS} =10V, T _C =25°C	58A	86A
R _{DS(on)} (typ)@V _{GS} =10V	6.7mΩ	4.3mΩ
R _{DS(on)} (typ)@V _{GS} =4.5V	9.9mΩ	5.5mΩ



S1 and D2 are connected to the bottom side.

Ordering Information

Device	Package	Shipping
KPRN060403S	DFN 5 ×6 (Pb-free lead plating & halogen-free package)	3000 pcs / Tape & Reel

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

Parameter		Symbol	Limits		Unit
			Tr 1	Tr 2	
Drain-Source Breakdown Voltage		BV _{DSS}	30	30	V
Gate-Source Voltage		V _{GS}	±20	±20	
Continuous Drain Current	T _A =25 °C, V _{GS} =10V	I _D	11.9	14.9	A
	T _A =85 °C, V _{GS} =10V		8.6	10.7	
	T _A =25 °C, V _{GS} =10V (Note 3)		18	23.1	
	T _A =85 °C, V _{GS} =10V (Note 3)		13	16.6	
	T _C =25 °C, V _{GS} =10V		58	86	
	T _C =100 °C, V _{GS} =10V		36.7	54.4	
Pulsed Drain Current (Note 1 & 2)		I _{DM}	120	180	mJ
Single Pulse Avalanche Current @ L=0.1mH		I _{AS}	32	40	
Single Pulse Avalanche Energy (Note 4)		E _{AS}	51	80	
Power Dissipation	T _A =25 °C (Note 3)	P _{DSM}	2.01	2.08	W
	T _A =70 °C (Note 3)		1.2	1.3	
	T _C =25 °C	P _D	48	69	
	T _C =100 °C		19	27	
Operating Junction and Storage Temperature Range		T _j ; T _{stg}	-55~+150		°C

Thermal Data

Parameter	Symbol	Value		Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	2.6	1.8	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	62	60	
Thermal Resistance, Junction-to-ambient, max (Note 3)		27	25	

- Note :
1. Pulse width limited by maximum junction temperature
 2. Duty cycle ≤ 1%
 3. Surface mounted on 1 in² copper pad of FR-4 board, t ≤ 10s; 125°C/W when mounted on minimum copper pad.
 4. For Tr 1, 100% tested by conditions of L=0.5mH, V_{DD}=15V, V_{GS}=10V, I_{AS}=5A; for Tr 2, 100% tested by conditions of L=0.5mH, V_{DD}=15V, V_{GS}=10V, I_{AS}=12A

Tr 1, 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
ΔBV _{DSS} /ΔT _j	-	26	-	mV/°C	Reference to 25°C, I _D =1mA
V _{GS(th)}	1.0	-	2.5	V	V _D =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _D =0V
I _{DSS}	-	-	1	μA	V _D =24V, V _{GS} =0V
	-	-	25		V _D =24V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	6.7	9	mΩ	V _{GS} =10V, I _D =10A
	-	9.9	14.5		V _{GS} =4.5V, I _D =10A
*G _{FS}	-	15.4	-	S	V _D =10V, I _D =5A
Dynamic					
C _{iss}	-	654	-	pF	V _D =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	159	-		
C _{rss}	-	70	-		
*t _{d(ON)}	-	7.4	-	ns	V _D =15V, I _D =10A, V _{GS} =10V, R _G =3Ω
*t _r	-	13	-		
*t _{d(OFF)}	-	26	-		
*t _f	-	7.6	-		
*Q _g (V _{GS} =10V)	-	13.6	-	nC	V _D =15V, I _D =10A, V _{GS} =10V
*Q _g (V _{GS} =4.5V)	-	6.8	-		
*Q _{gs}	-	2.2	-		
*Q _{gd}	-	2.7	-		
Body Diode					
*V _{SD}	-	0.76	1	V	V _{GS} =0V, I _S =3A
*t _{rr}	-	11.3	-	ns	I _F =3A, dI _F /dt=100A/μs
*Q _{rr}	-	4.6	-	nC	

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

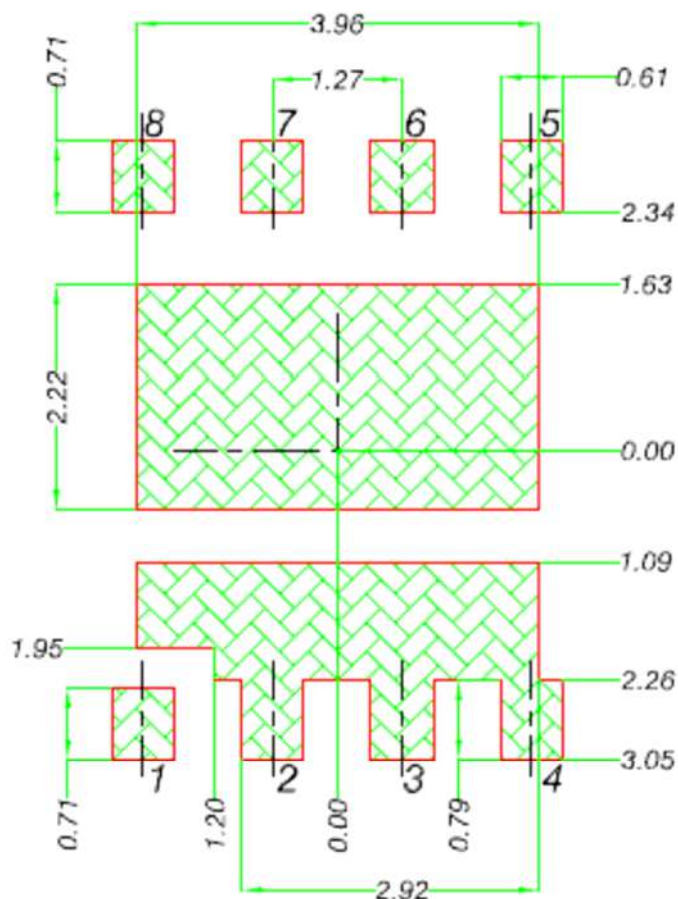
Tr 2, Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	30	-	-	V	V _{GS} =0V, I _D =-250μA
ΔBV _{DSS} /ΔT _j	-	26	-	mV/°C	Reference to 25°C, I _D =1mA
V _{GS(th)}	1.0	-	2.5	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0V
	-	-	25		V _{DS} =24V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	4.3	5.5	mΩ	V _{GS} =10V, I _D =15A
	-	5.5	7.2		V _{GS} =4.5V, I _D =15A
*G _{FS}	-	13.6	-	S	V _{DS} =10V, I _D =7A
Dynamic					
C _{iss}	-	1459	-	pF	V _{DS} =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	278	-		
C _{rss}	-	208	-		

*td(ON)	-	13	-	ns	V _{DS} =15V, I _D =15A, V _{GS} =10V, R _G =2.7Ω
*tr	-	15.8	-		
*td(OFF)	-	46.4	-		
*tf	-	10.8	-		
*Qg(V _{GS} =10V)	-	34.3	-	nC	V _{DS} =15V, I _D =15A, V _{GS} =10V
*Qg(V _{GS} =4.5V)	-	18.1	-		
*Qgs	-	4.6	-		
*Qgd	-	8.6	-		
Body Diode					
*V _{SD}	-	0.73	1	V	V _{GS} =0V, I _S =2A
*trr	-	15.7	-	ns	I _F =2A, dI _F /dt=100A/μs
*Qrr	-	8.4	-	nC	

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

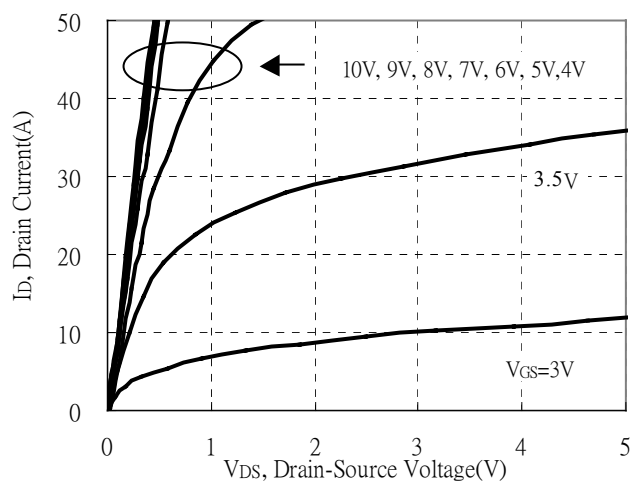
Recommended Soldering Footprint



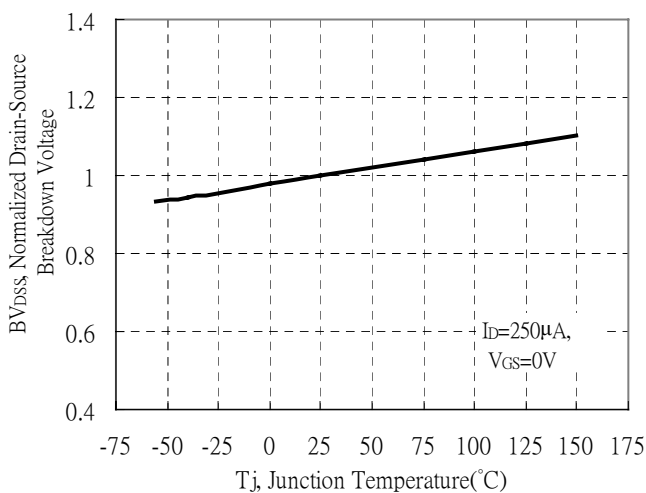
unit : mm

Typical Characteristics : Q1(N-channel)

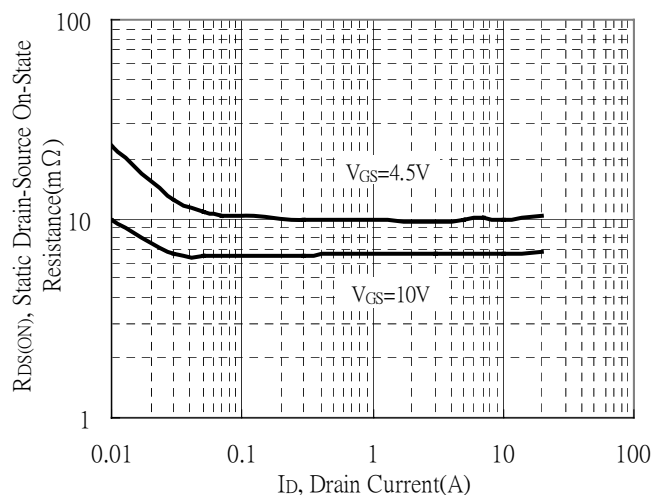
Typical Output Characteristics



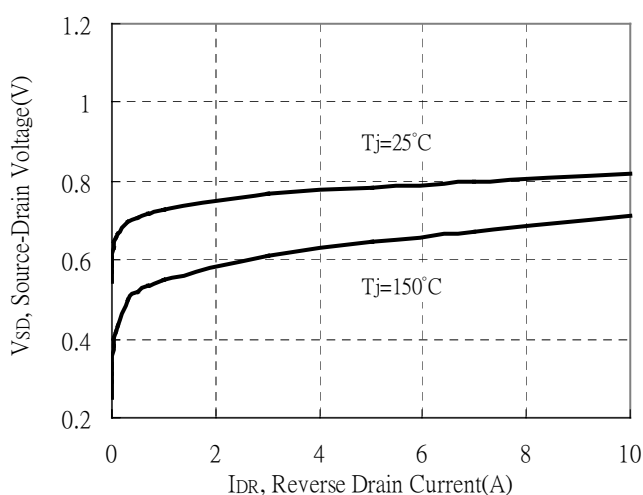
Breakdown Voltage vs Ambient Temperature



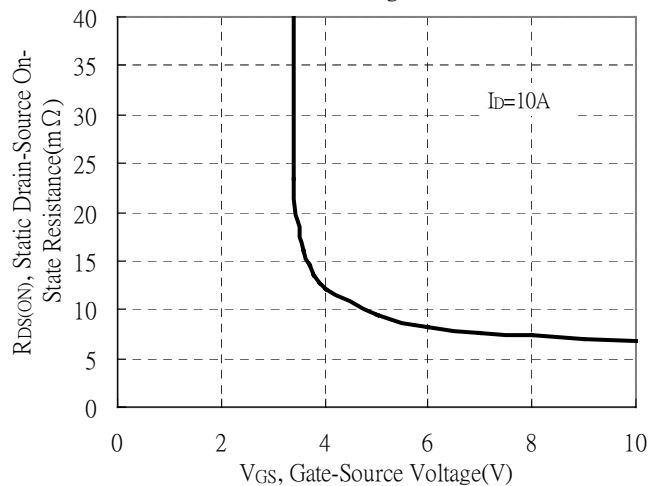
Static Drain-Source On-State resistance vs Drain Current



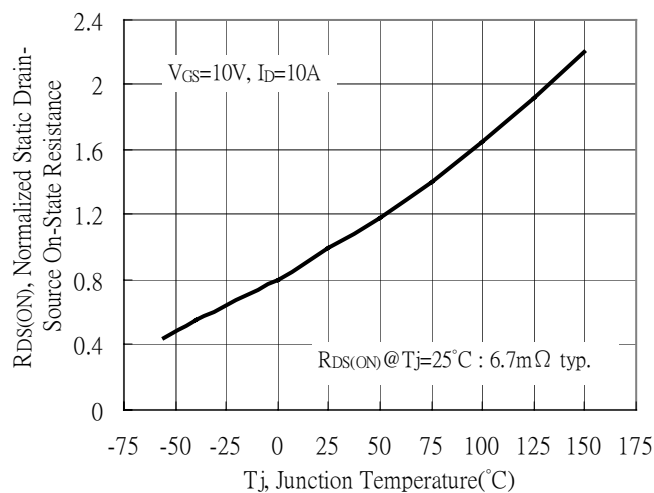
Reverse Drain Current vs Source-Drain Voltage



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

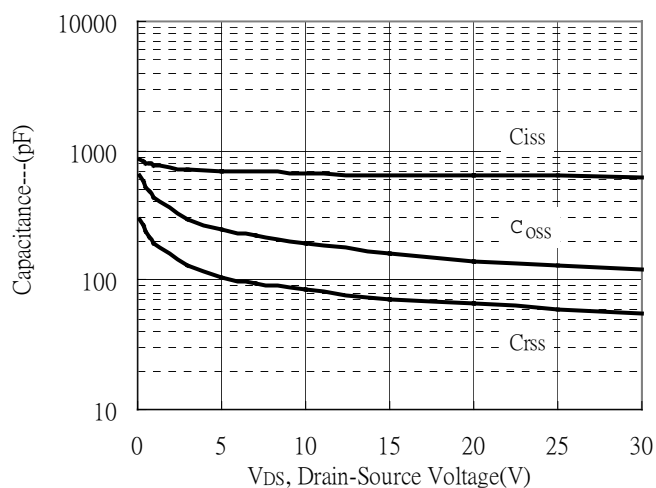


Drain-Source On-State Resistance vs Junction Temperature

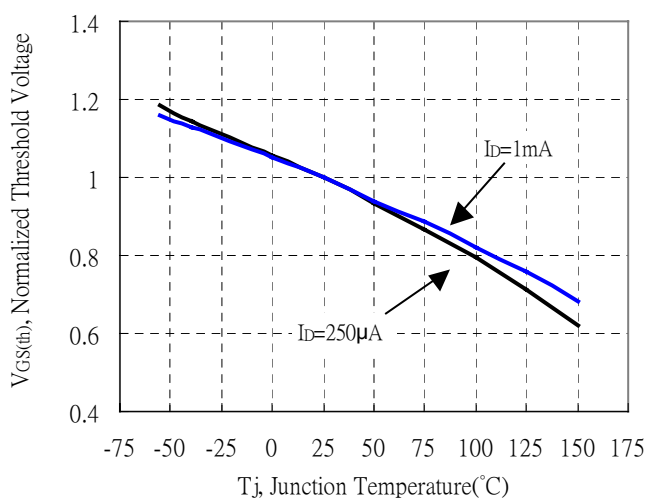


Typical Characteristics(Cont.) : Q1(N-channel)

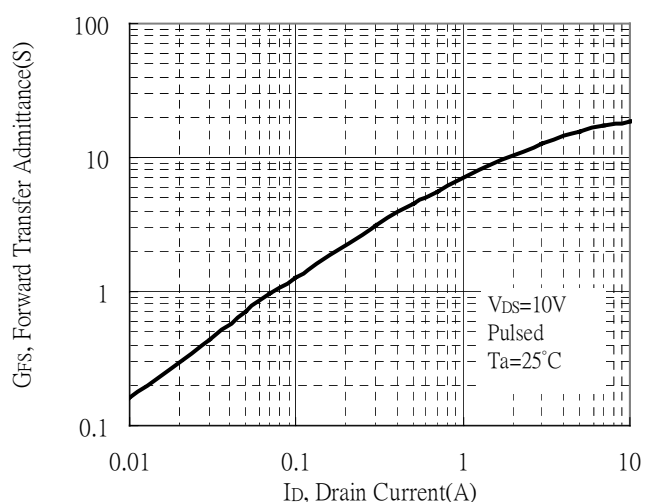
Capacitance vs Drain-to-Source Voltage



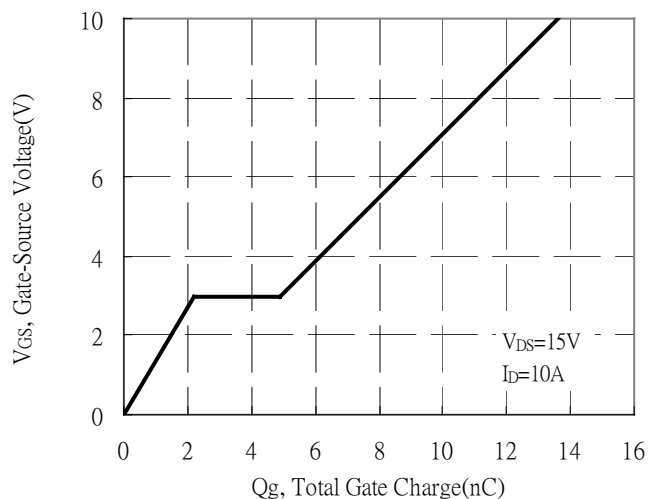
Threshold Voltage vs Junction Temperature



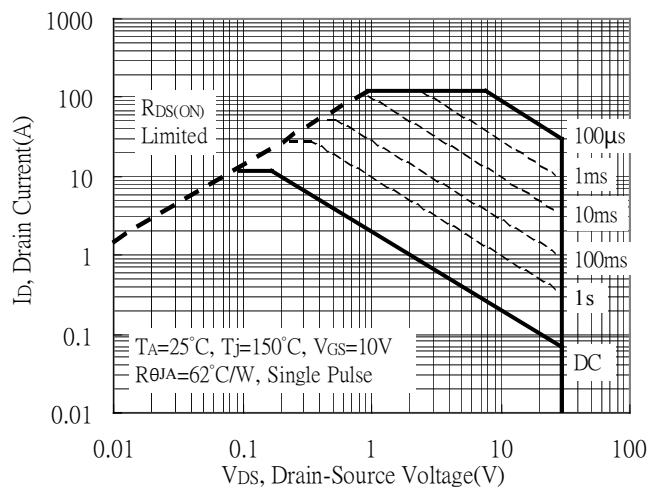
Forward Transfer Admittance vs Drain Current



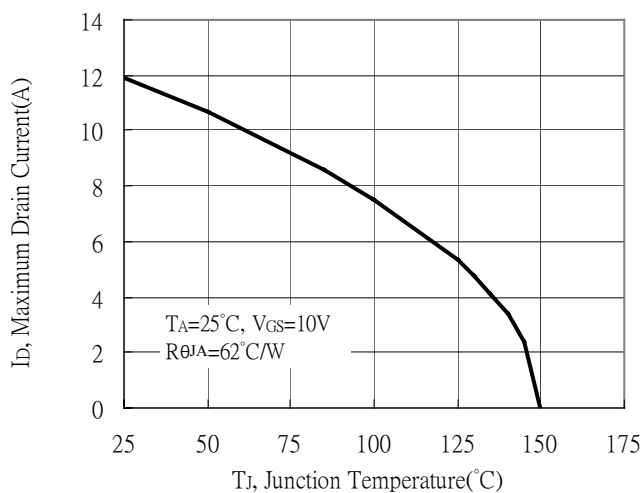
Gate Charge Characteristics



Maximum Safe Operating Area

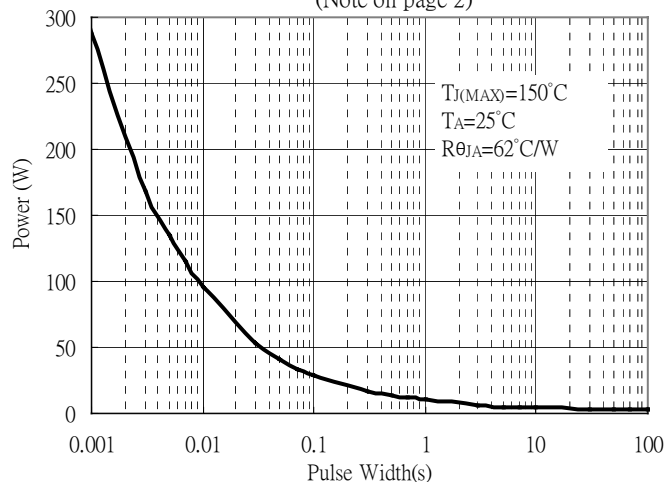


Maximum Drain Current vs Junction Temperature

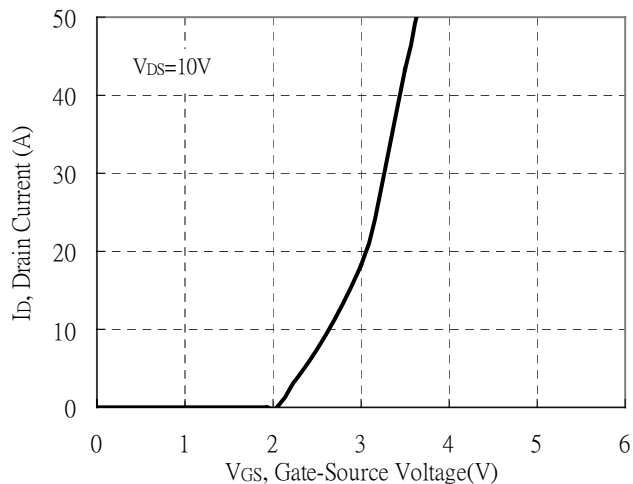


Typical Characteristics(Cont.) : Q1(N-channel)

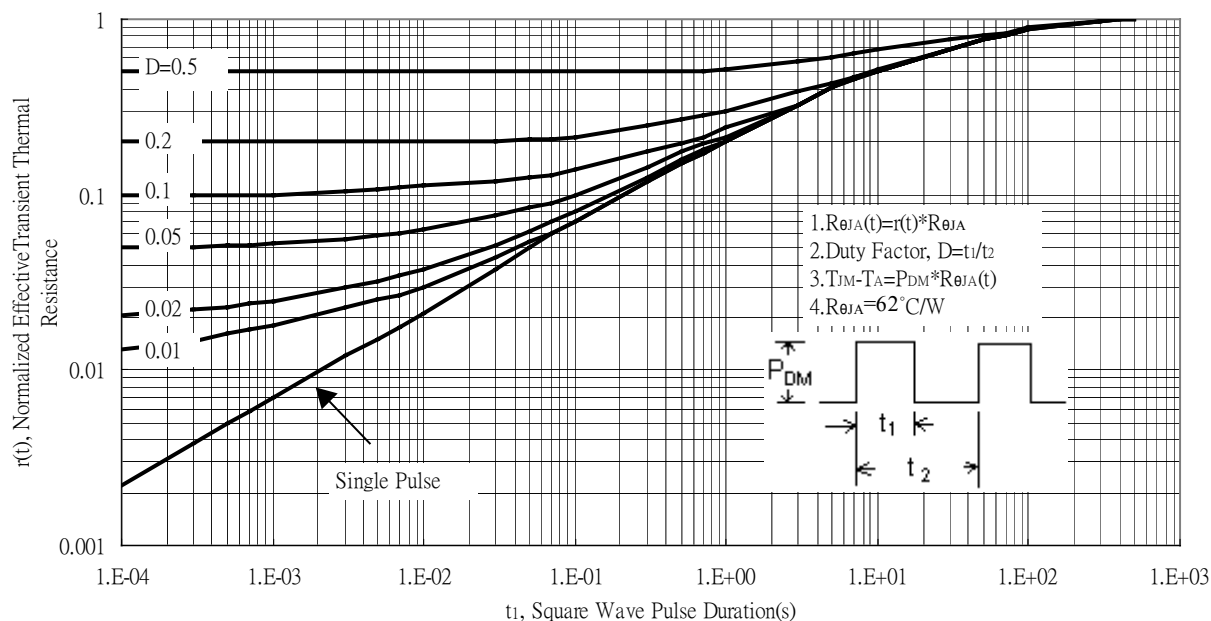
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



Typical Transfer Characteristics

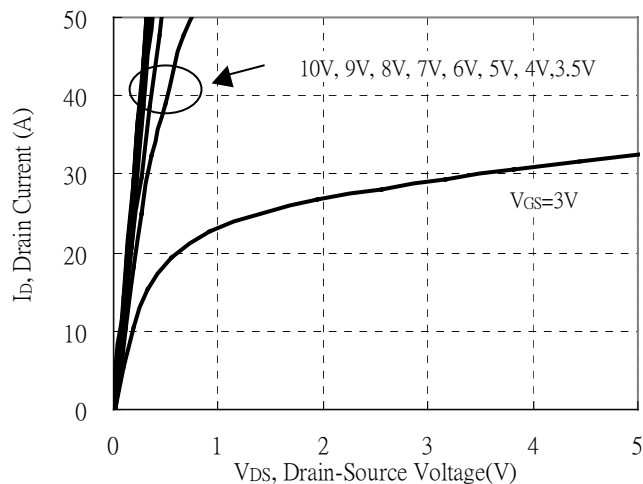


Transient Thermal Response Curves

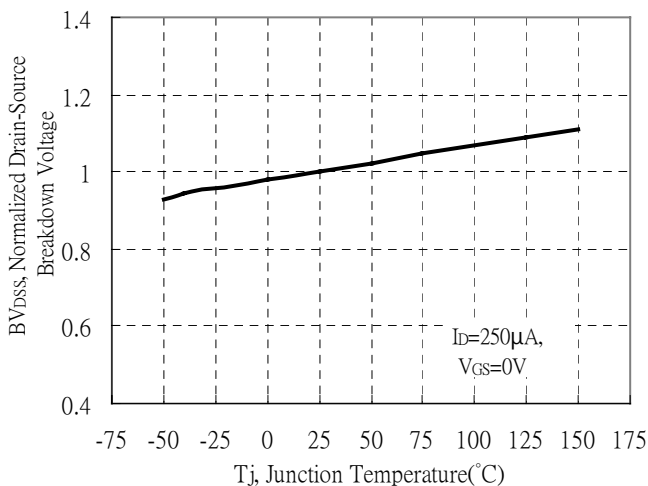


Typical Characteristics : Q2(N-channel)

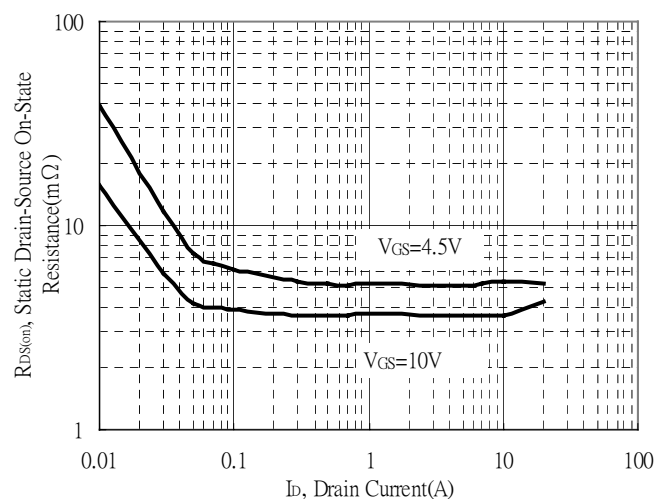
Typical Output Characteristics



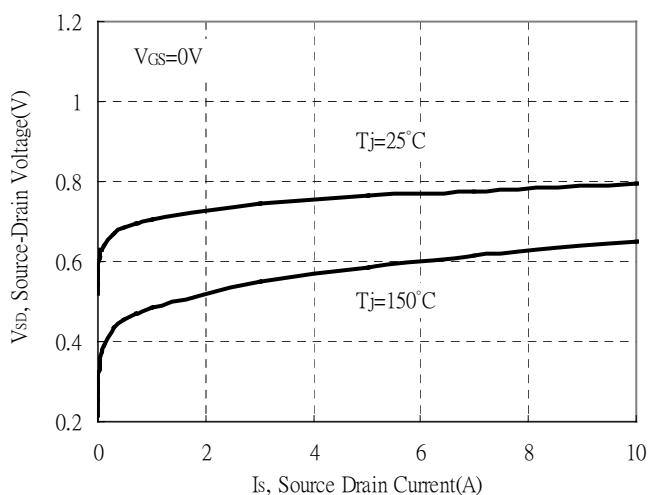
Breakdown Voltage vs Ambient Temperature



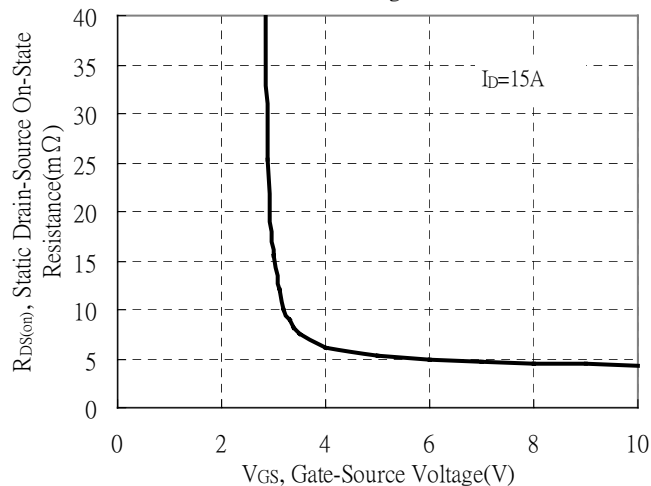
Static Drain-Source On-State resistance vs Drain Current



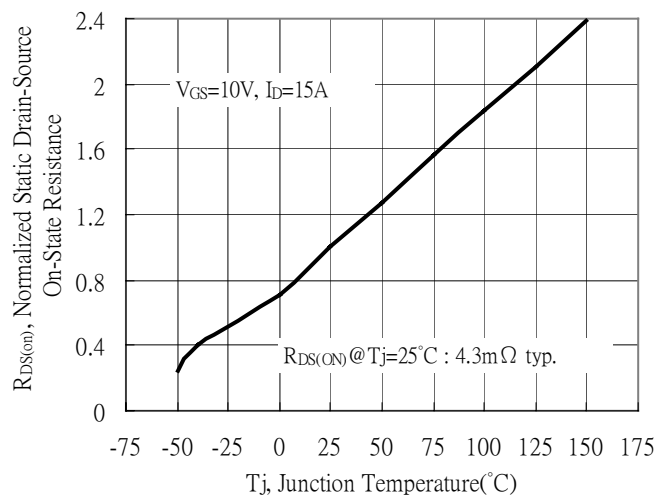
Source Drain Current vs Source-Drain Voltage



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

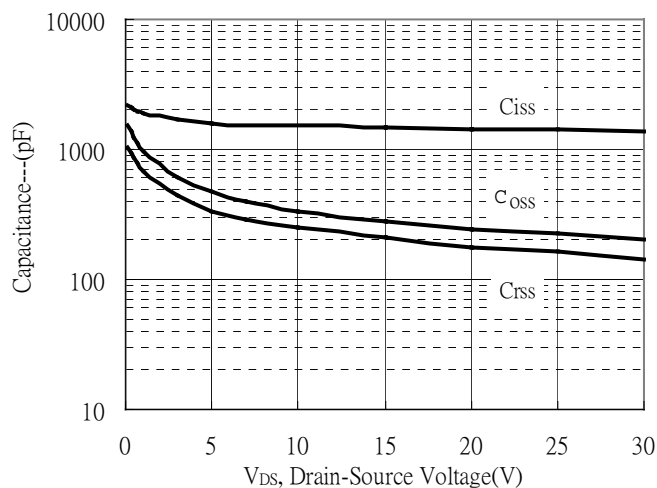


Drain-Source On-State Resistance vs Junction Temperature

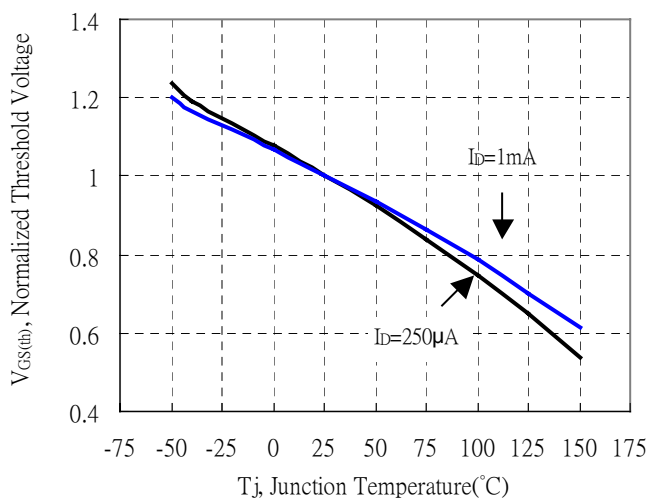


Typical Characteristics(Cont.) : Q2(N-channel)

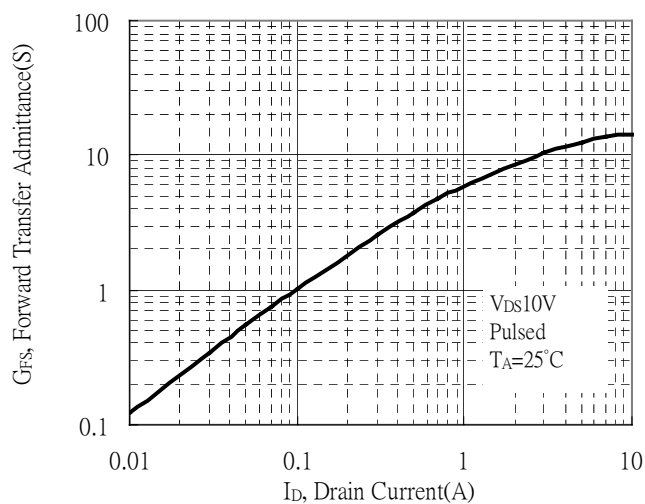
Capacitance vs Drain-to-Source Voltage



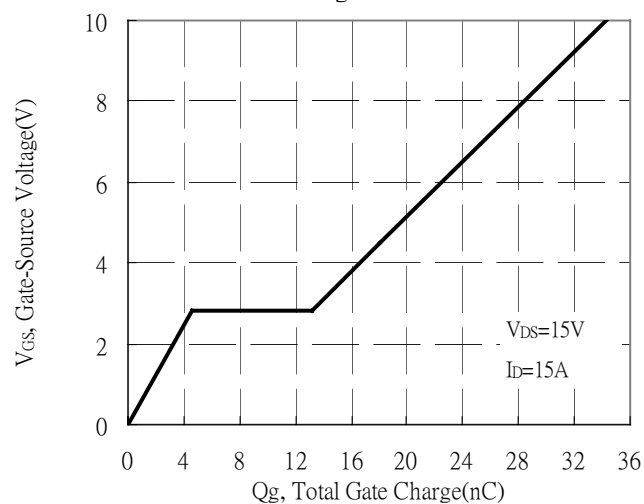
Threshold Voltage vs Junction Temperature



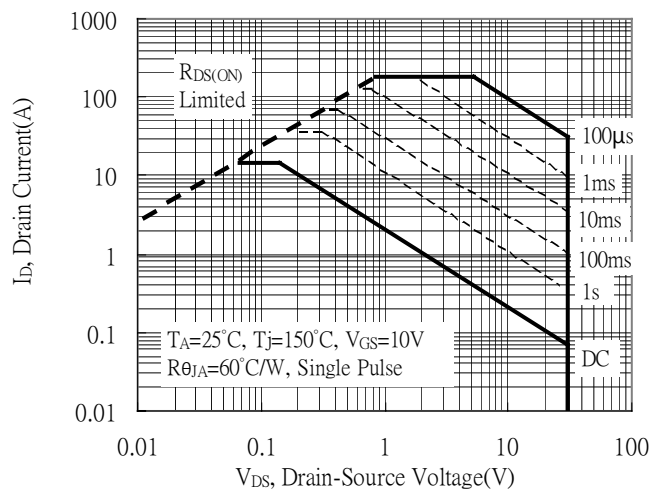
Forward Transfer Admittance vs Drain Current



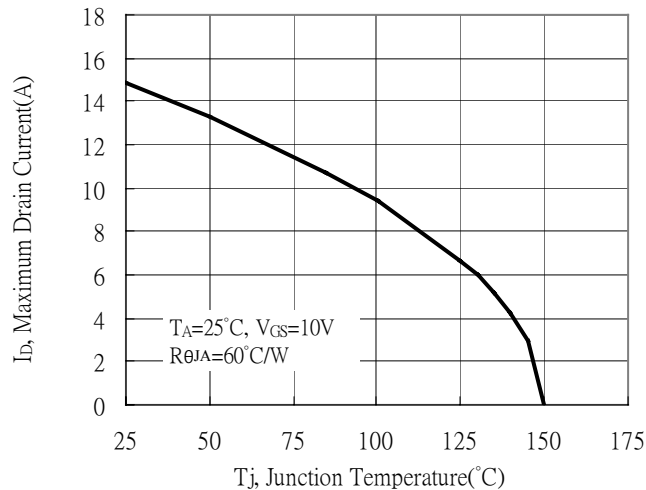
Gate Charge Characteristics



Maximum Safe Operating Area

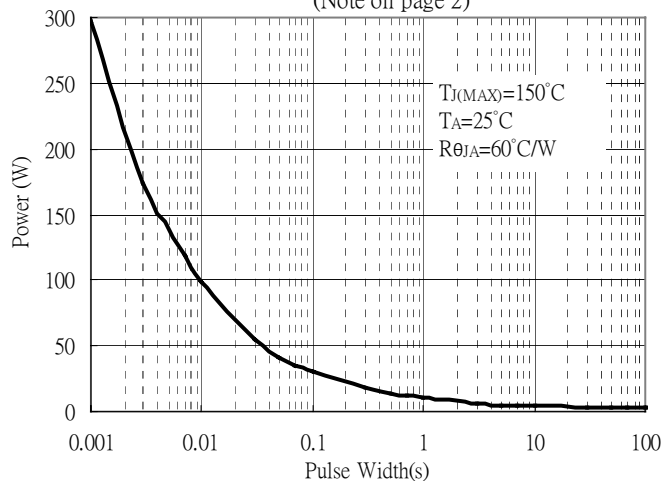


Maximum Drain Current vs Junction Temperature

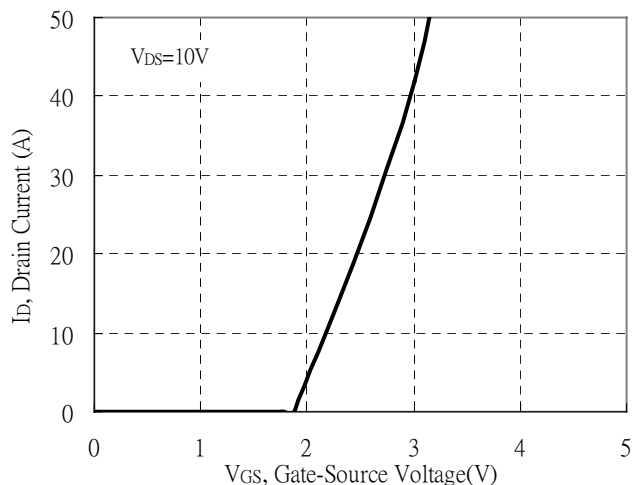


Typical Characteristics(Cont.) : Q2(N-channel)

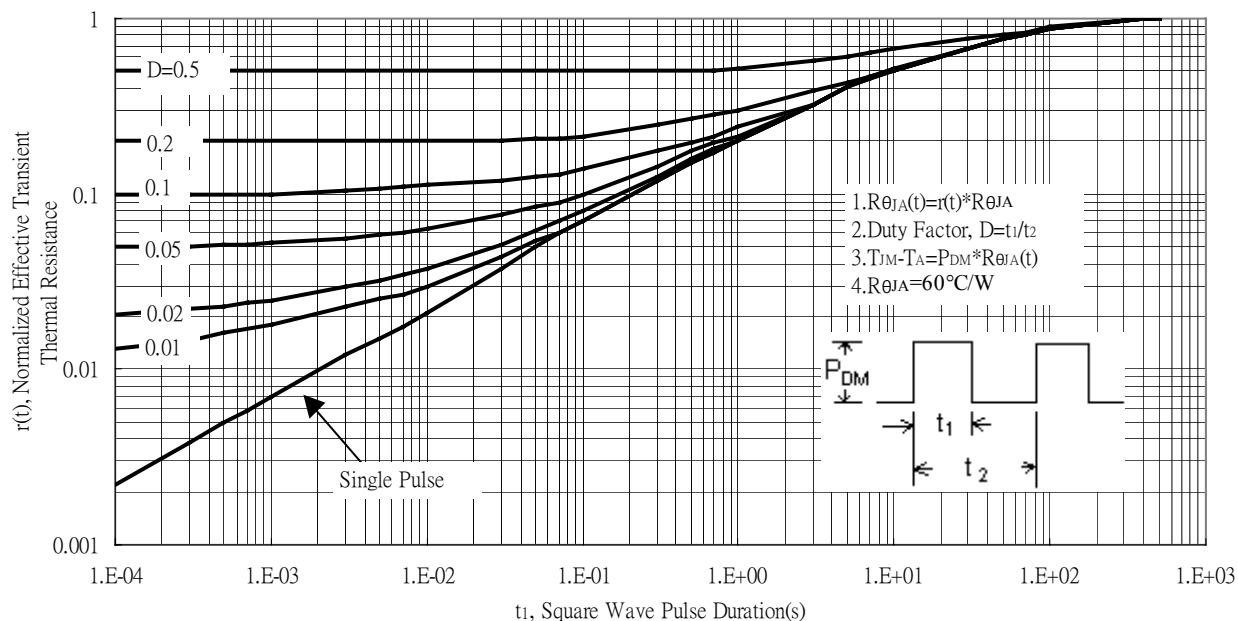
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



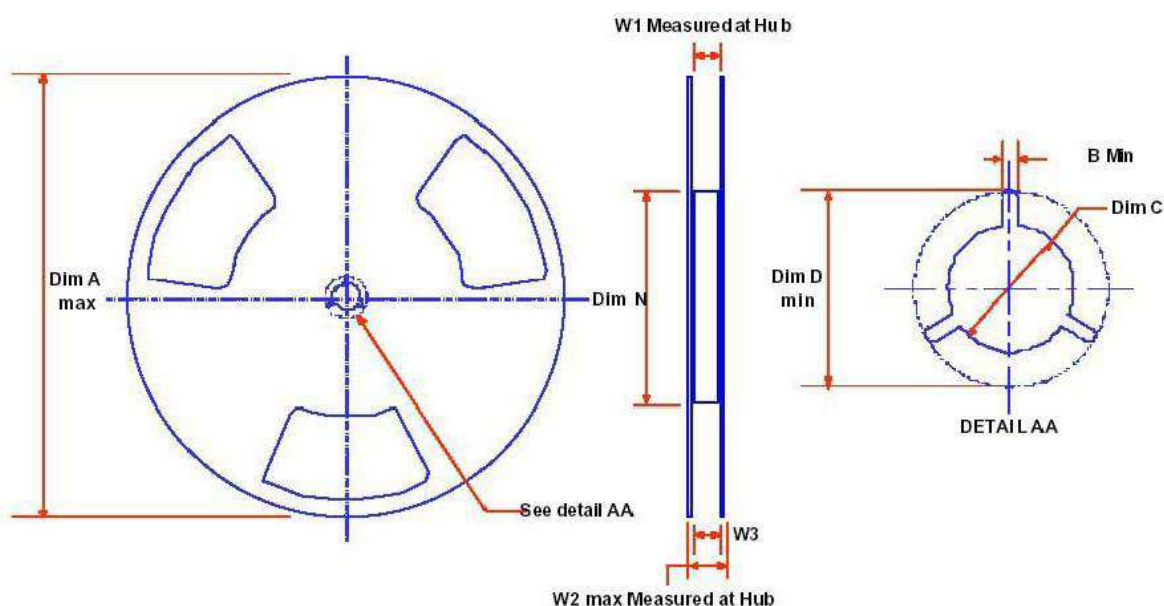
Typical Transfer Characteristics



Transient Thermal Response Curves



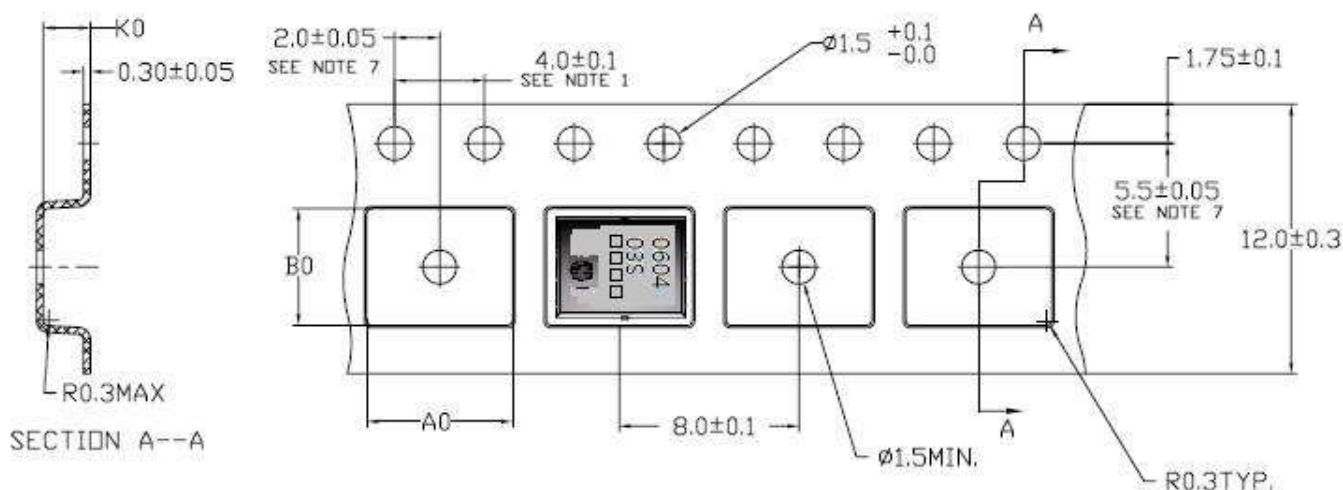
Reel Dimension



Dimensions are in inches and millimeters

Tape Size	Reel Option	Dim A	Dim B	Dim C	Dim D	Dim N	Dim W1	Dim W2	Dim W3 (LSL-USL)
12mm	13" Dia (STD/L99Z)	13.00 330+/-1	0.059 1.5 Min.	0.512 13.0 Min.	0.795 20.2(ref.)	7.00 178+0/-2	0.488 +0.078/-0.000 12.4+2/0	0.724 18.4(ref.)	0.469 - 0.606 11.9 - 15.4

Carrier Tape Dimension

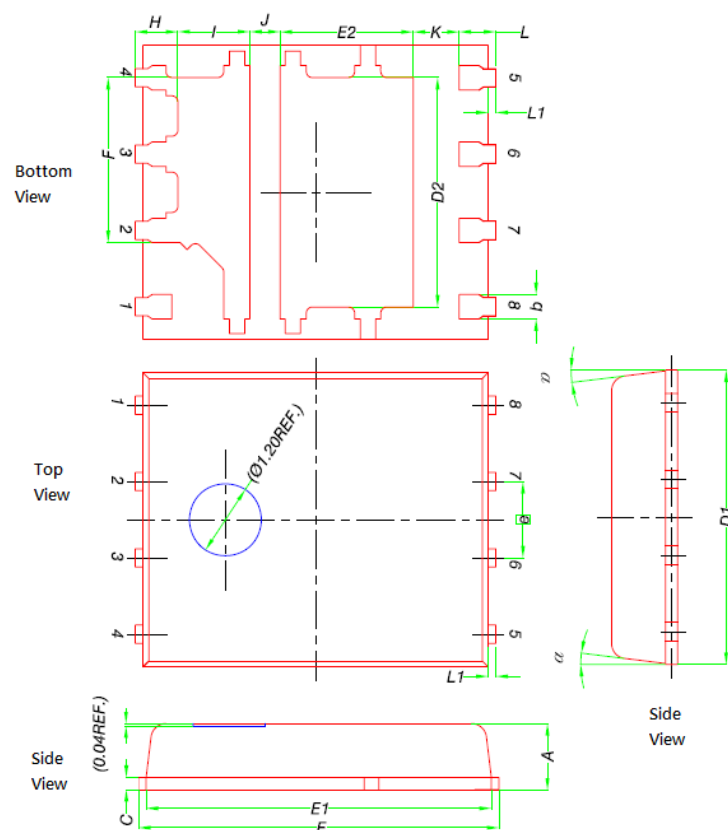


NOTE:

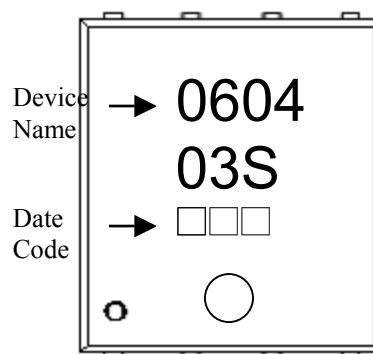
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.2
2. CAMBER NOT TO EXCEED 1mm IN 100mm, NONCUMULATIVE OVER 250mm.
3. MATERIAL: BLACK STATIC DISSIPATIVE PS.(POLYSTYRENE)
4. ALL DIMENSIONS ARE IN MILLIMETERS (UNLESS OTHERWISE SPECIFIED)
5. A0 AND B0 MEASURED ON A PLANE 0.3mm ABOVE THE BOTTOM OF THE POCKET
6. K0 MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
7. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE
8. SURFACE RESISTIVITY
1X10E4~1X10E11 OHMS/SQ.
1X10E4~1X10E6 OHMS/SQ. for Fairchild Only

A0=6.5±0.1
B0=5.3±0.1
K0=1.4±0.1

DFN5x6 Dimension



Marking:



8-Lead DFN5x6 Plastic Package

Note:

1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash, Protrusion Or Gate Burrs.
Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10 mm Per Side.
3. Package Body Sizes Determined At The Outermost Extremes Of The Plastic Body Exclusive Of Mold Flash, Tie Bar, Tie Bar Burrs, Gate Burrs And Interlead Flash, But Including Any Mismatch Between The Top And Bottom Of The Plastic Body.
4. The Package Top May Be Smaller Than The Package Bottom.

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043	F	2.55	2.90	0.100	0.114
b	0.33	0.51	0.013	0.020	H	0.61	0.81	0.024	0.032
C	0.20	0.30	0.008	0.012	I	1.10	1.30	0.043	0.051
D1	4.80	5.00	0.189	0.197	J	0.40	0.60	0.016	0.024
D2	3.61	3.96	0.142	0.156	K	0.50	-	0.020	-
E	5.90	6.10	0.232	0.240	L	0.51	0.71	0.020	0.028
E1	5.70	5.80	0.224	0.228	L1	0.06	0.20	0.002	0.008
E2	2.02	2.42	0.080	0.095	α	0°	12°	0°	12°
e	1.27 BSC		0.050 BSC						