

N- AND P-Channel Enhancement Mode MOSFET

Features:

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- ESD protected gate
- Common drain structure
- Pb-free lead plating and halogen-free package

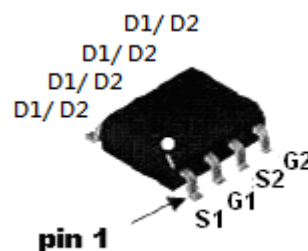
Description:

The KSS20C06K consists of a N-channel and a 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.

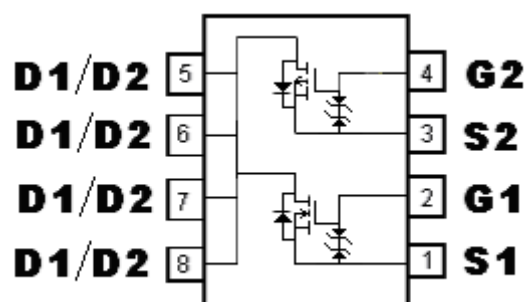
Outline

SOP-8



Equivalent Circuit

KSS20C06K



G : Gate S : Source D : Drain

	N-CH	P-CH
BV_{DSS}	60V	-60V
$I_D@V_{GS}=10V(-10V)$	6A	-5A
$R_{DS(on)(TYP.)}@V_{GS}=10V(-10V)$	16.1mΩ	27.9mΩ
$R_{DS(on)(TYP.)}@V_{GS}=4.5V(-4.5V)$	25.2mΩ	41.4mΩ
$R_{DS(on)(TYP.)}@V_{GS}=4V(-4V)$	28.5mΩ	47.8mΩ

Ordering Information

Device	Package	Shipping
KSS20C06K	SOP-8 (Pb-free lead plating & halogen-free package)	2500 pcs / Tape & Reel

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

Parameter		Symbol	Limits		Unit
			N-channel	P-channel	
Drain-Source Breakdown Voltage		BV _{DSS}	60	-60	V
Gate-Source Voltage		V _{GS}	±20	±20	
Continuous Drain Current (Note 2)	T _A =25 °C, V _{GS} =10V (-10V)	I _D	6	-5	A
	T _A =70 °C, V _{GS} =10V (-10V)		4.8	-4	
Pulsed Drain Current (Note 1)		I _{DM}	30	-20	
Power Dissipation for Dual Operation		P _D	2		W
Power Dissipation for Single Operation			1.6 (Note 2)		
			0.9 (Note 3)		
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 _{th,j-c}	10	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	78 (Note 2)	
		135 (Note 3)	

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

N-Channel Electrical Characteristics (Tc=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)}	1.0	-	2.5		V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =60V, V _{GS} =0V
	-	-	25		V _{DS} =48V, V _{GS} =0V, T _j =85°C
*R _{DS(ON)}	-	16.1	21	mΩ	I _D =6A, V _{GS} =10V
	-	25.2	33		I _D =4A, V _{GS} =4.5V
	-	28.5	40		I _D =3A, V _{GS} =4V
*G _{FS}	-	15	-	S	V _{DS} =5V, I _D =6A
Dynamic					
C _{iss}	-	736	-	pF	V _{DS} =20V, V _{GS} =0, f=1MHz
C _{oss}	-	140	-		
C _{rss}	-	69.7	-		
*t _{d(ON)}	-	8.6	-	ns	V _{DS} =30V, I _D =1A, V _{GS} =10V, R _G =6Ω
*t _r	-	17.6	-		
*t _{d(OFF)}	-	39.8	-		
*t _f	-	20	-		
*Q _g	-	17.5	-	nC	V _{DS} =48V, I _D =6A, V _{GS} =10V
*Q _{gs}	-	1.7	-		
*Q _{gd}	-	5.9	-		
Body Diode					
*I _S	-	-	6	A	
*I _{SM}	-	-	24		
*V _{SD}	-	0.8	1.2	V	V _{GS} =0V, I _S =6A
*t _{rr}	-	13.9	-	ns	I _F =2A, dI _F /dt=100A/μs
*Q _{rr}	-	8.9	-	nC	

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

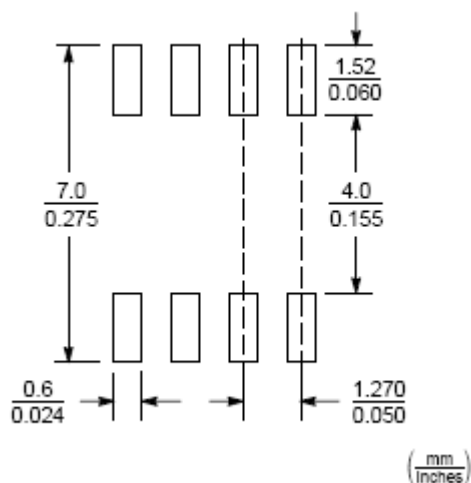
P-Channel Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-60	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-1.0	-	-2.5		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	-1		V _{DS} =-60V, V _{GS} =0V
	-	-	-25		V _{DS} =-48V, V _{GS} =0V, T _j =85°C
*R _{DS(ON)}	-	27.9	36.5	mΩ	I _D =-5A, V _{GS} =-10V
	-	41.4	54.0		I _D =-4A, V _{GS} =-4.5V
	-	47.8	62.5		I _D =-3A, V _{GS} =-4V
*G _{FS}	-	13	-	S	V _{DS} =-5V, I _D =-5A

Dynamic					
Ciss	-	1453	-	pF	VDS=-20V, VGS=0, f=1MHz
Coss	-	218	-		
Crss	-	120	-		
*td(ON)	-	14	-	ns	VDS=-30V, ID=-1A, VGS=-10V, RG=6Ω
*tr	-	18.8	-		
*td(OFF)	-	68.2	-		
*tf	-	66.2	-		
*Qg	-	28.5	-	nC	VDS=-48V, ID=-5A, VGS=-10V
*Qgs	-	4.9	-		
*Qgd	-	8.4	-		
Body Diode					
*IS	-	-	-5	A	
*ISM	-	-	-20		
*VSD	-	-0.79	-1.2	V	VGS=0V, IS=-5A
*trr	-	14.9	-	ns	IF=2A, dIF/dt=100A/μs
*Qrr	-	8.3	-	nC	

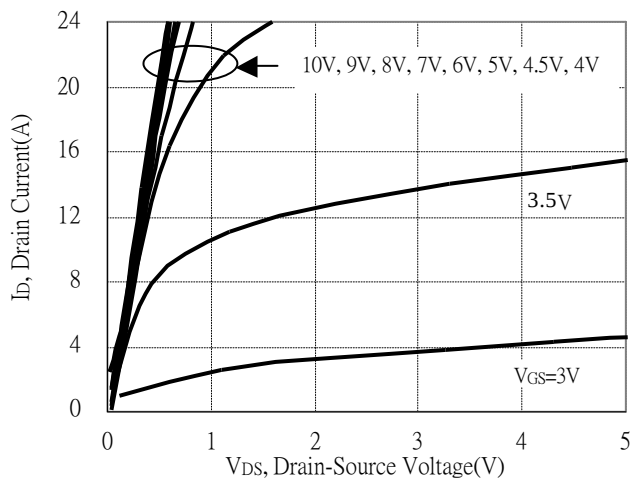
*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Recommended Soldering Footprint

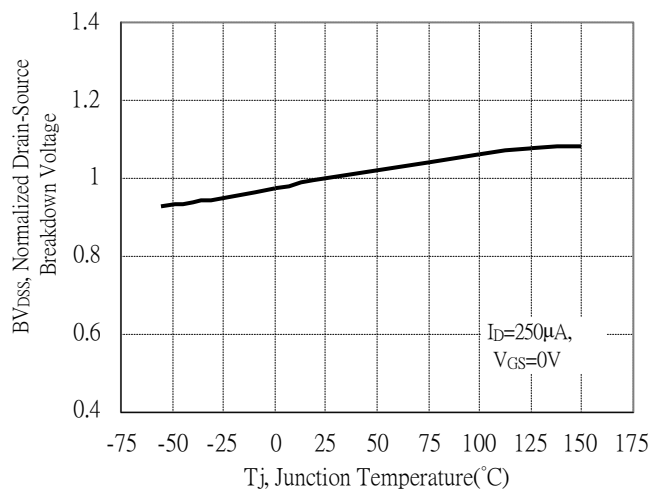


Typical Characteristics : Q1(N-channel)

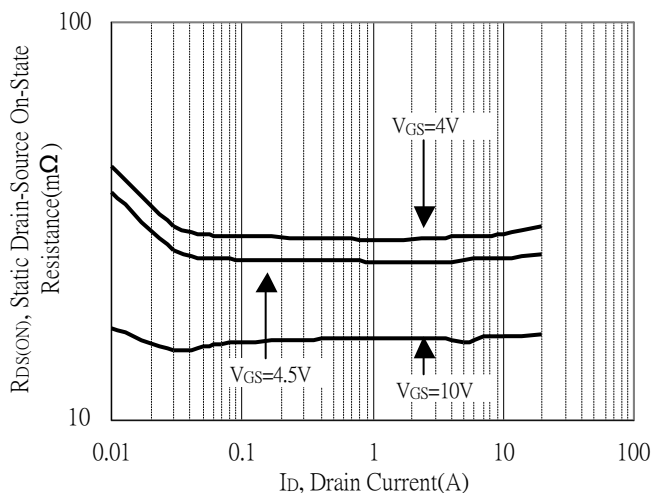
Typical Output Characteristics



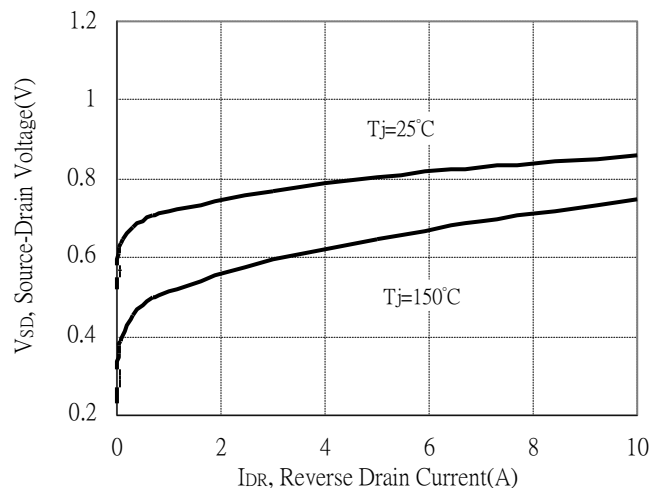
Breakdown Voltage vs Ambient Temperature



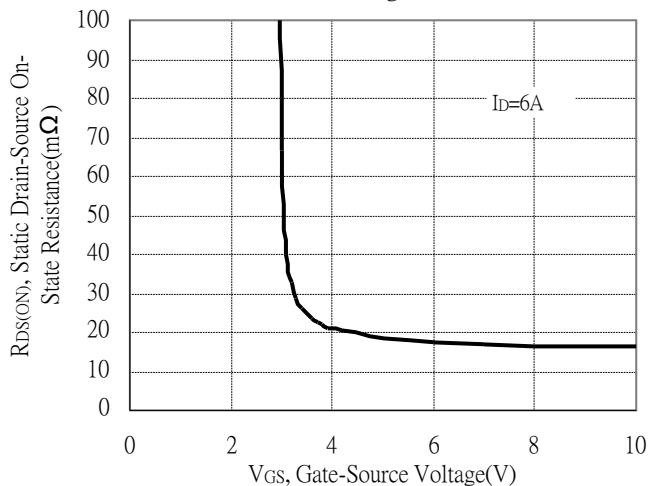
Static Drain-Source On-State resistance vs Drain Current



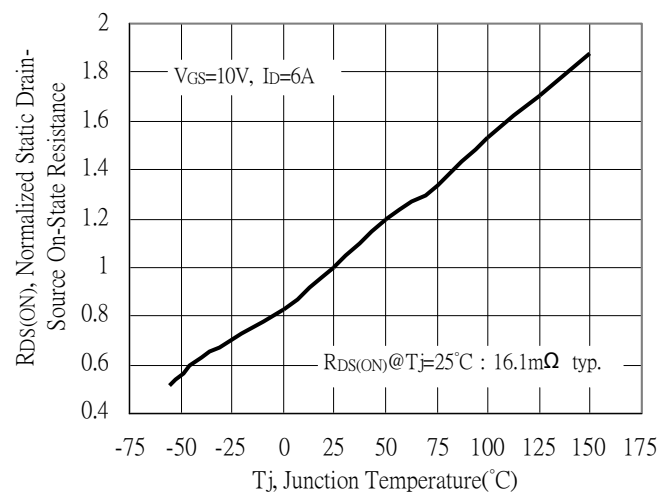
Reverse Drain Current vs Source-Drain Voltage



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

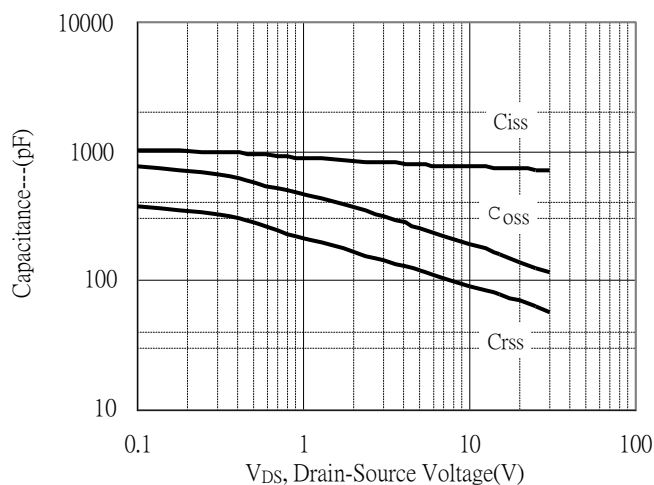


Drain-Source On-State Resistance vs Junction Temperature

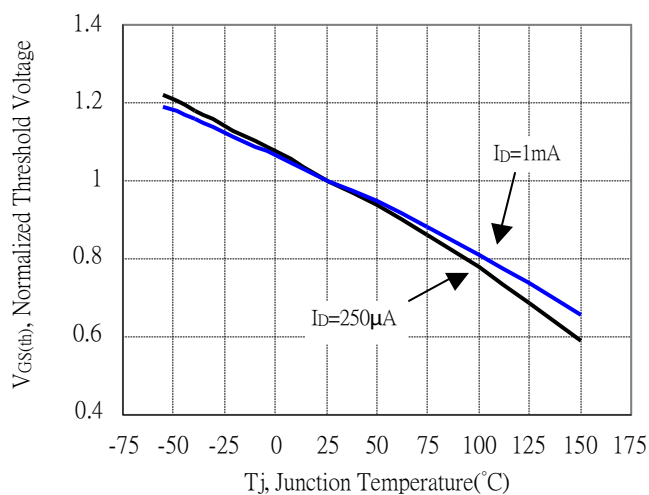


Typical Characteristics(Cont.) : Q1(N-channel)

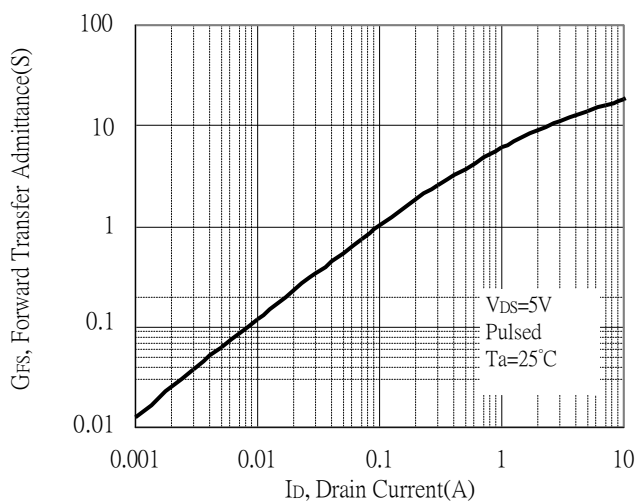
Capacitance vs Drain-to-Source Voltage



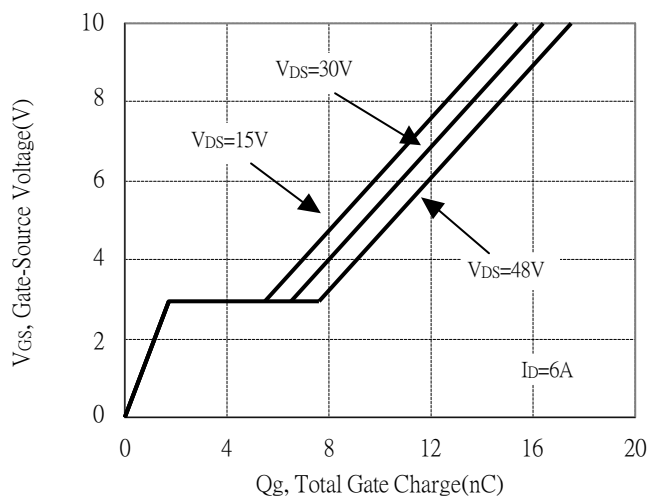
Threshold Voltage vs Junction Temperature



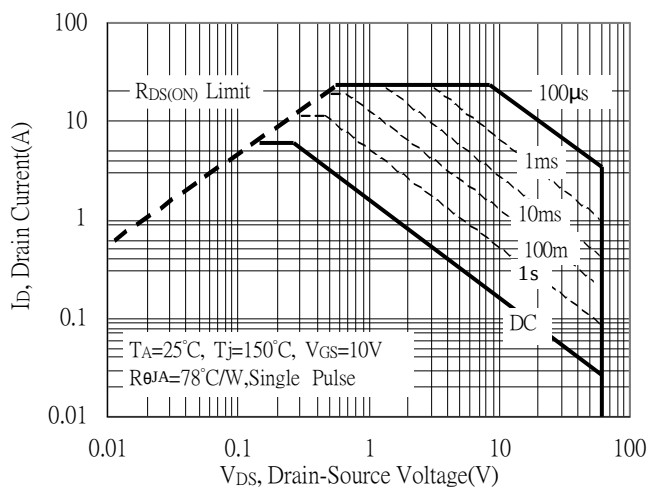
Forward Transfer Admittance vs Drain Current



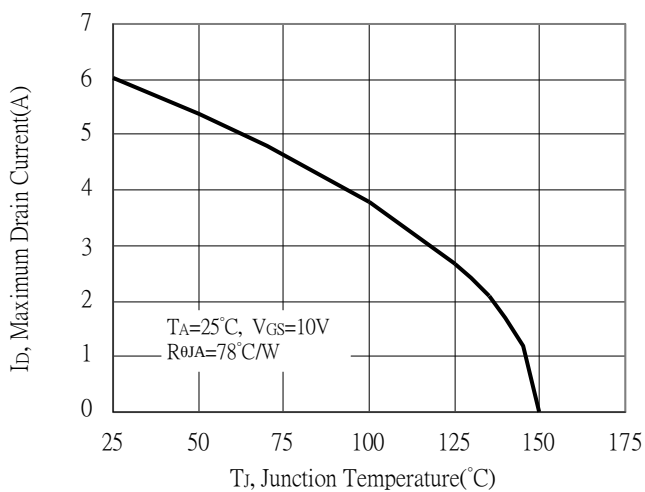
Gate Charge Characteristics



Maximum Safe Operating Area

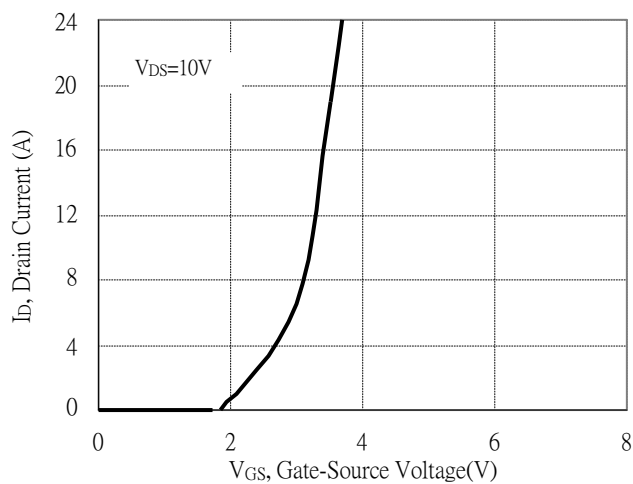


Maximum Drain Current vs Junction Temperature

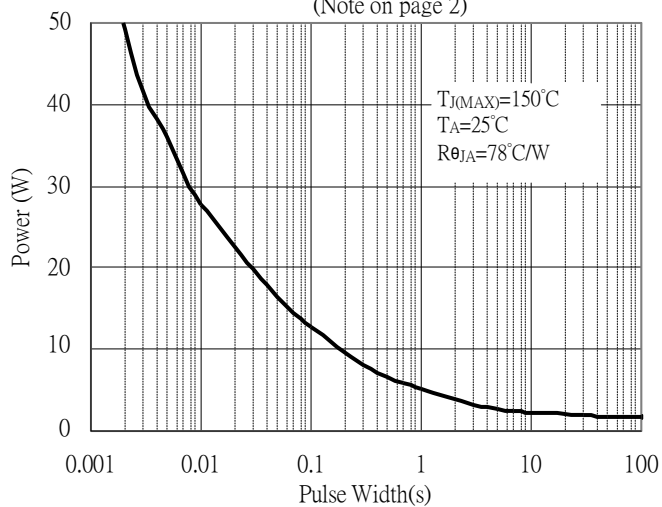


Typical Characteristics(Cont.) : Q1(N-channel)

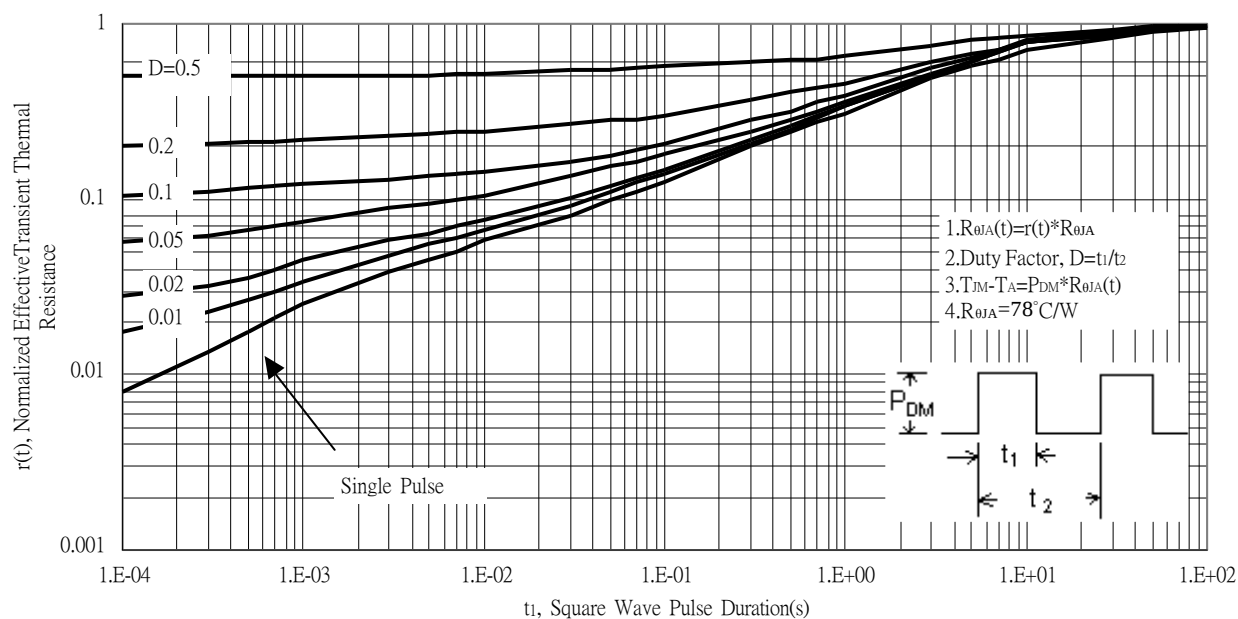
Typical Transfer Characteristics



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

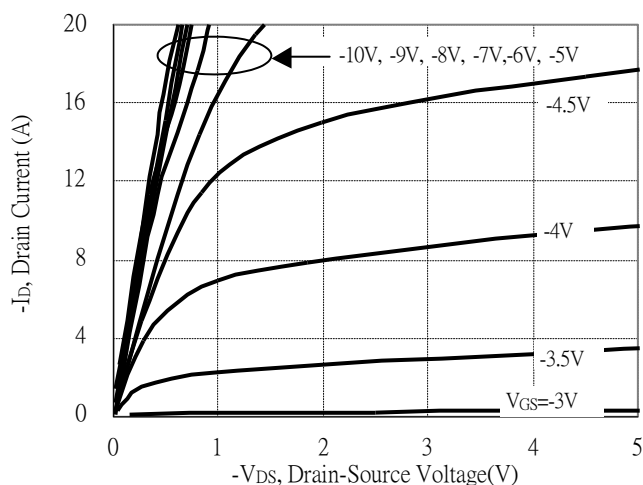


Transient Thermal Response Curves

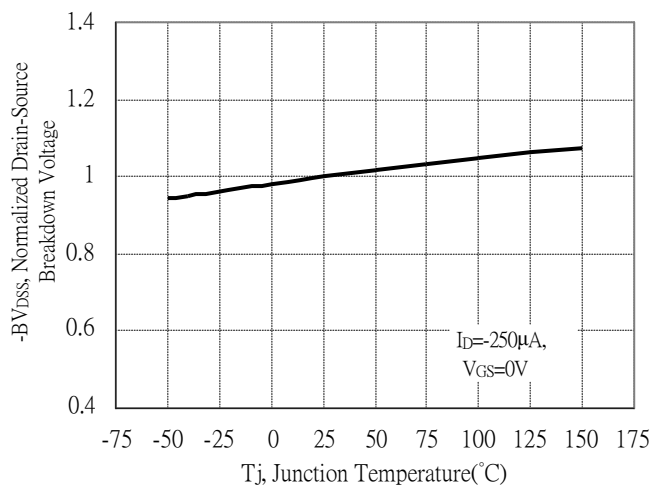


Typical Characteristics : Q2(P-channel)

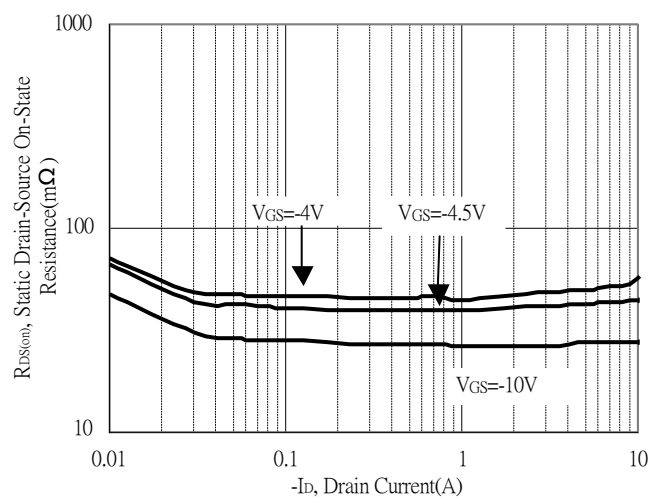
Typical Output Characteristics



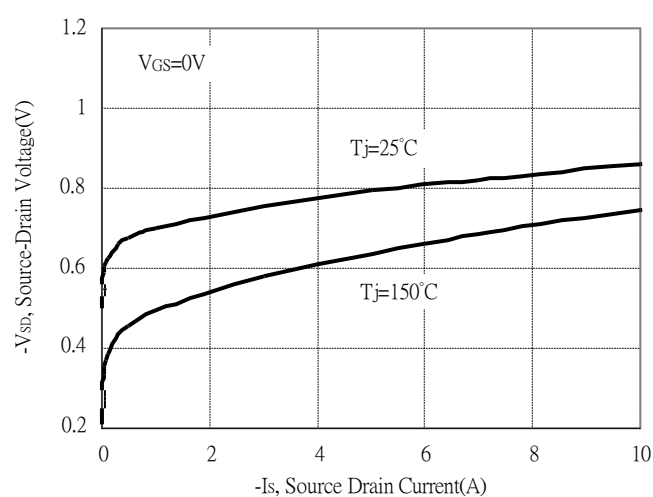
Breakdown Voltage vs Ambient Temperature



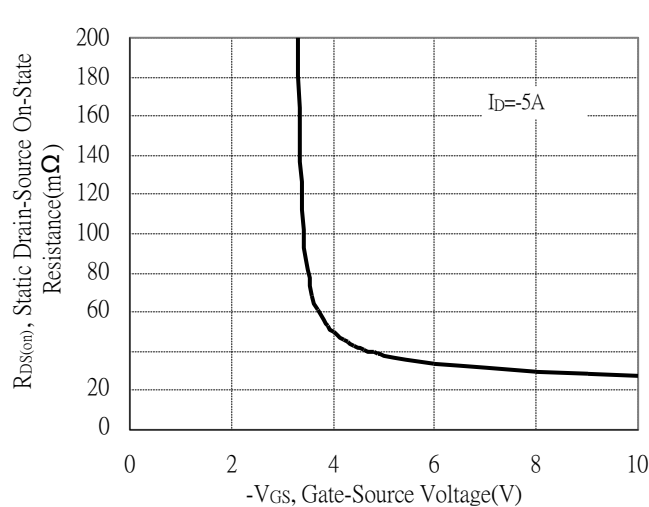
Static Drain-Source On-State resistance vs Drain Current



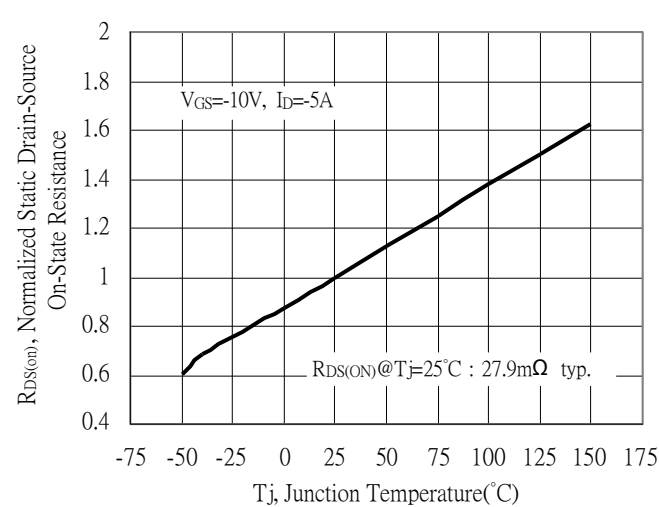
Source Drain Current vs Source-Drain Voltage



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

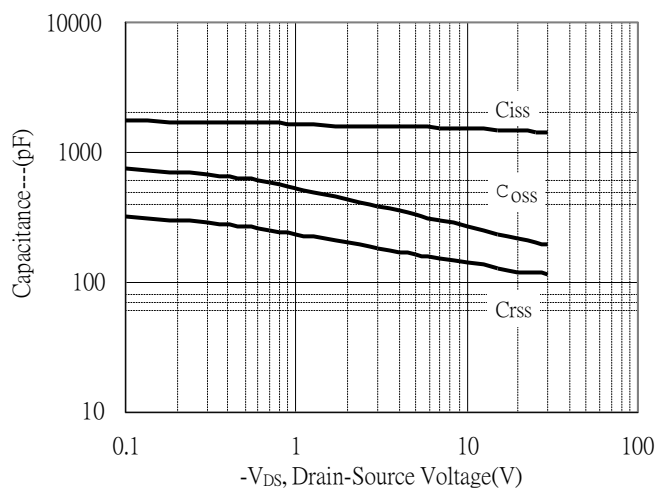


Drain-Source On-State Resistance vs Junction Temperature

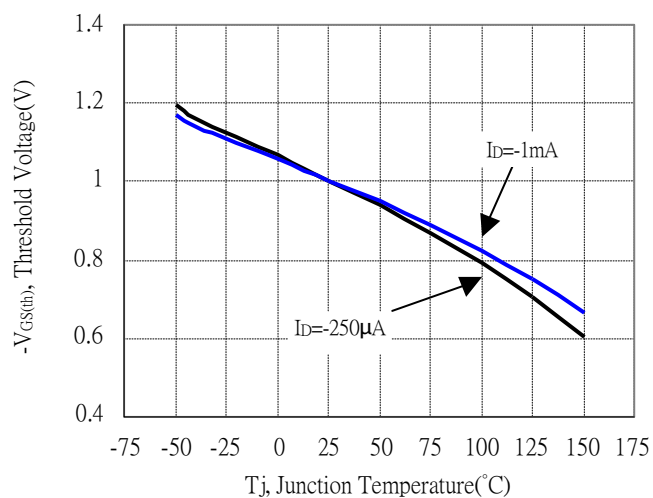


Typical Characteristics(Cont.) : Q2(P-channel)

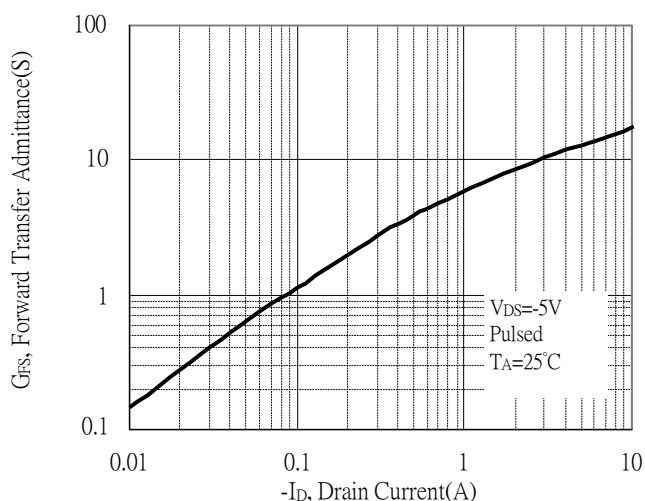
Capacitance vs Drain-to-Source Voltage



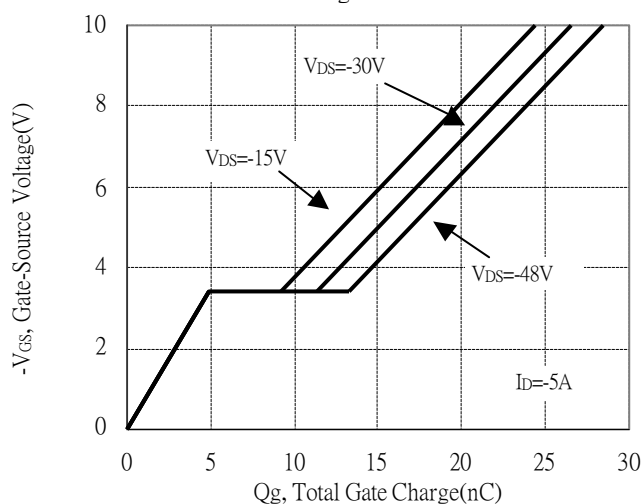
Threshold Voltage vs Junction Temperature



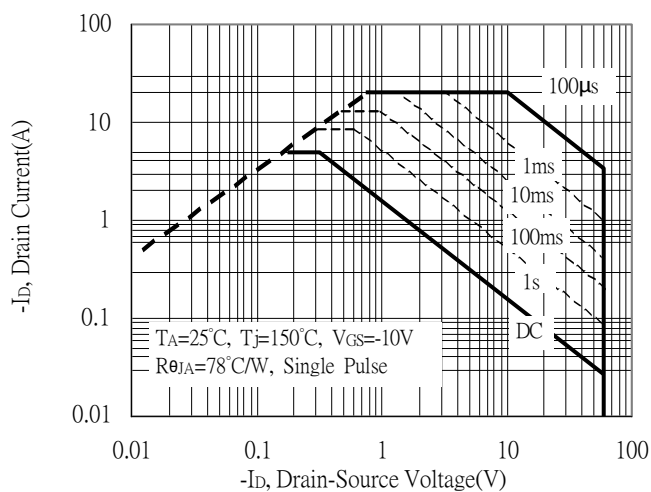
Forward Transfer Admittance vs Drain Current



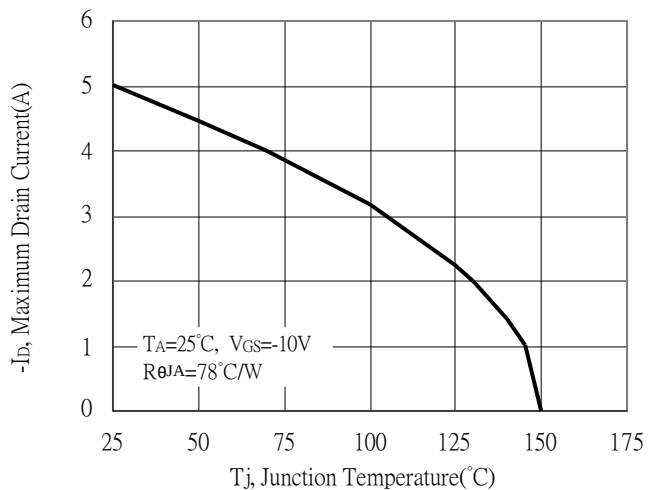
Gate Charge Characteristics



Maximum Safe Operating Area

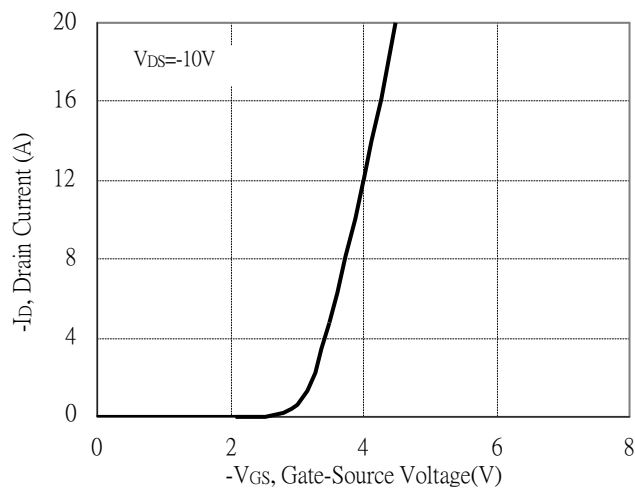


Maximum Drain Current vs Junction Temperature

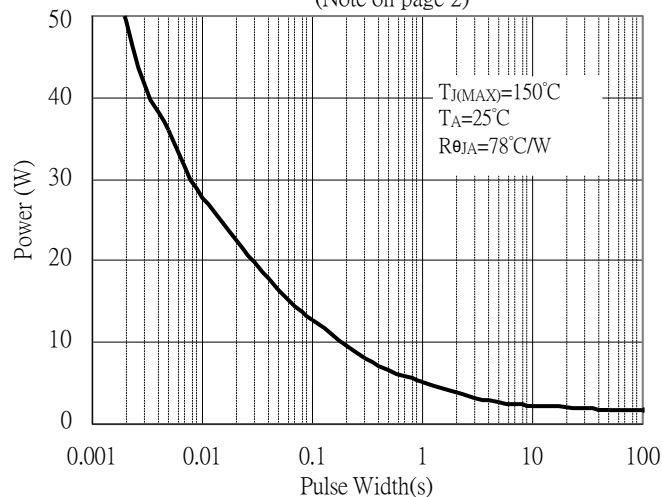


Typical Characteristics(Cont.) : Q2(P-channel)

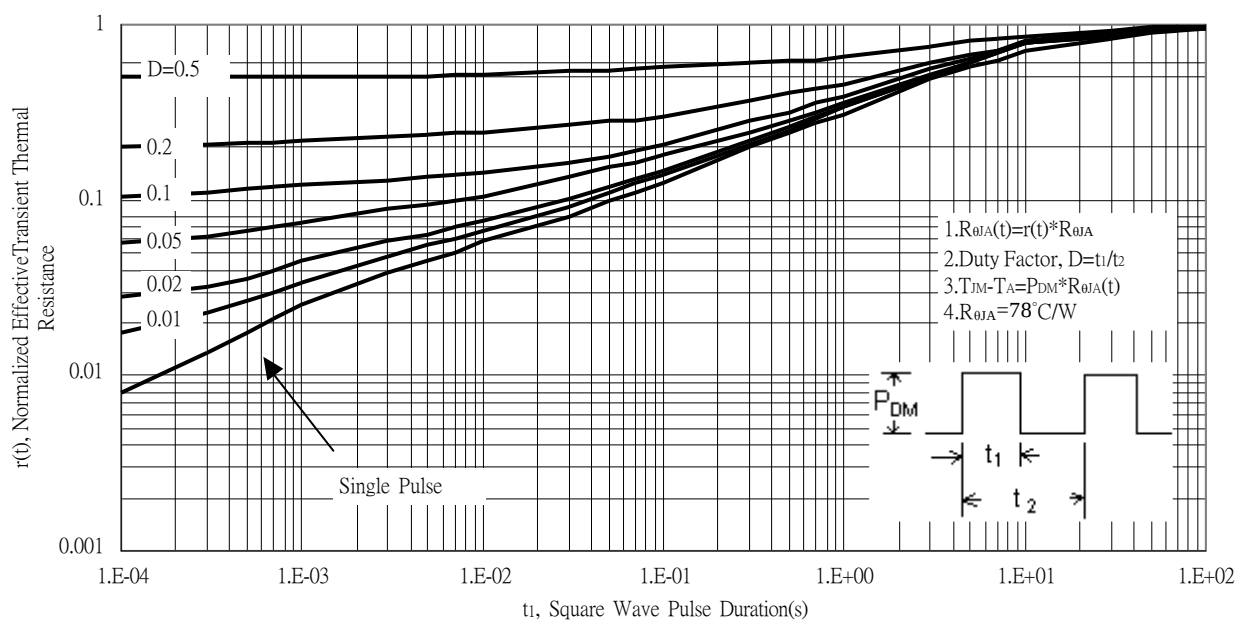
Typical Transfer Characteristics



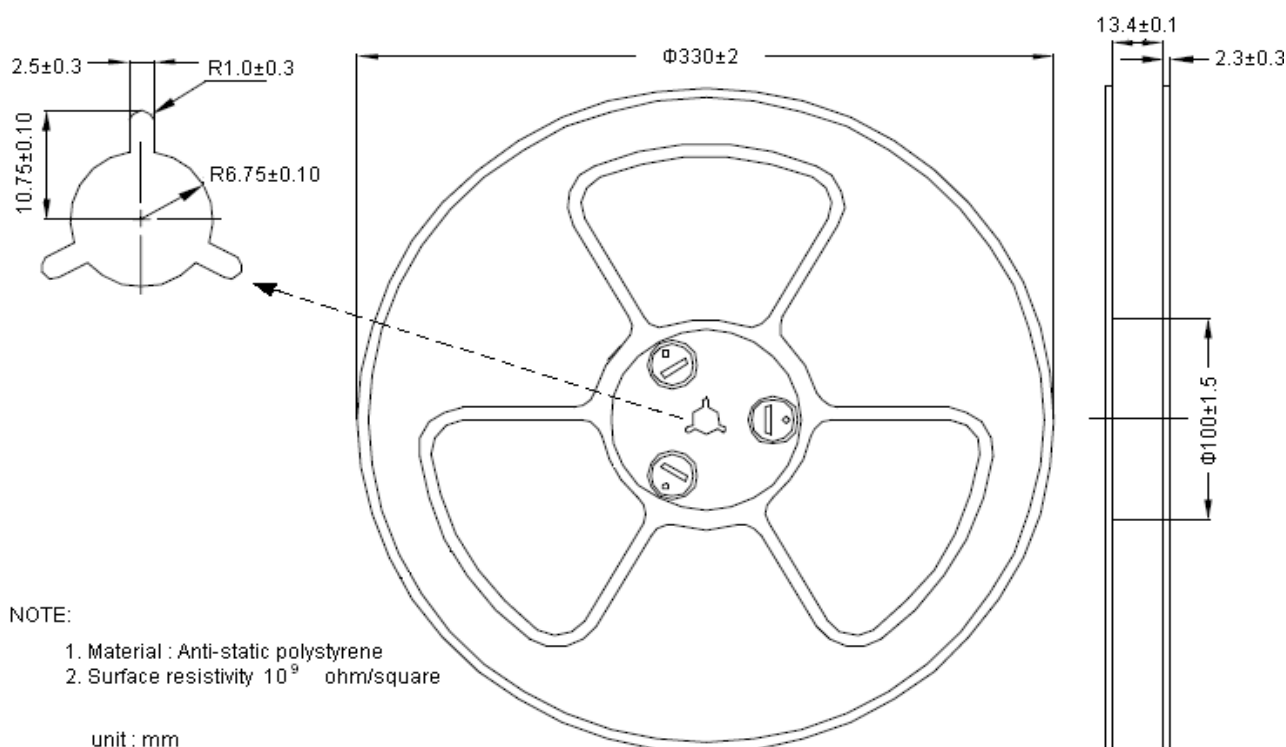
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



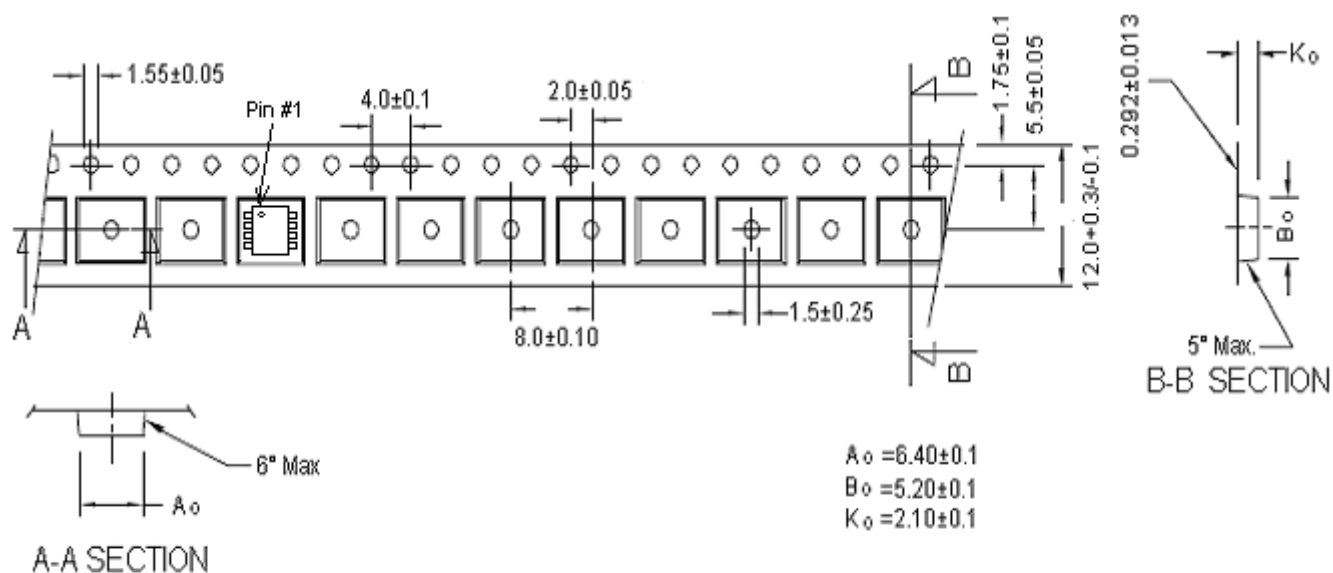
Transient Thermal Response Curves



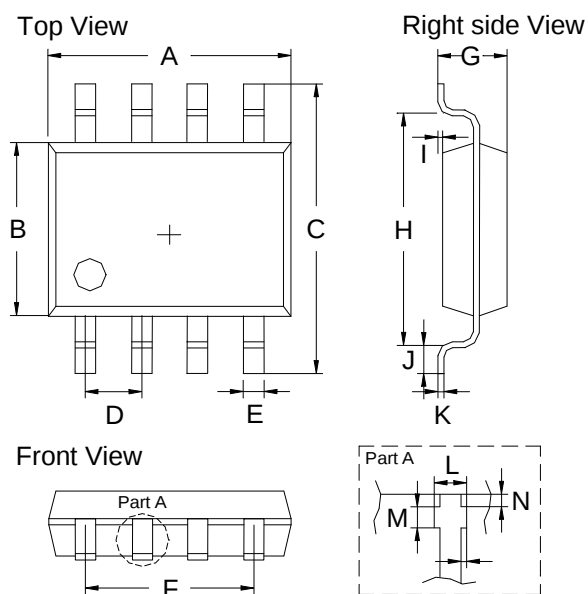
Reel Dimension



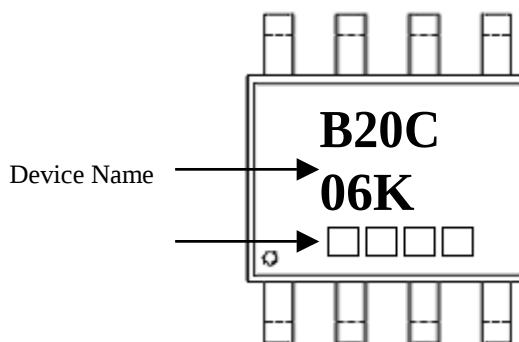
Carrier Tape Dimension



SOP-8 Dimension



Marking:



Package Code: Q8

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0145	0.0185	0.37	0.47	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0570	0.0649	1.45	1.65	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					