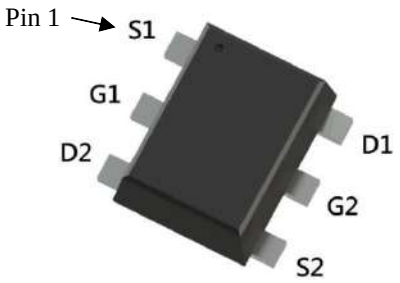
N- AND P-Channel Enhancement Mode Power MOSFET

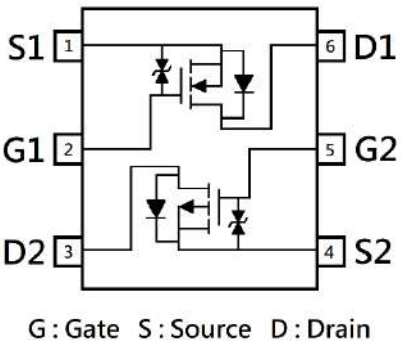
Features:

- Low On Resistance
- Low Gate Charge
- RoHS compliant package
- ESD protected gate, typical 4kV (HBM)

SOT-563



	N-CH	P-CH
BV_{DSS}	20V	-20V
I_D@V_{GS}=(-)4.5V, T_A=25°C	0.83A	-0.52A
$R_{DS(ON)}$ typ. @ V_{GS}=(-)4.5V	0.32Ω	0.75Ω
$R_{DS(ON)}$ typ. @ V_{GS}=(-)2.5V	0.4Ω	0.9Ω
$R_{DS(ON)}$ typ. @ V_{GS}=(-)1.8V	0.7Ω	1.1Ω



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KWA300C02K	SOT-563 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Limits		Unit
			N-CH	P-CH	
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	±8	±8	
Continuous Drain Current @ V_{GS}=(-)4.5V, T_A=25°C		I_D	0.83	-0.52	A
Continuous Drain Current @ V_{GS}=(-)4.5V, T_A=70°C			0.66	-0.42	
Pulsed Drain Current	*a	I_{DM}	3.32	-2.08	
Continuous Body Diode Forward Current @ T_A=25°C		I_S	0.42	-0.42	
ESD susceptibility	*b	V_{ESD}	4000	4000	V
Total Power Dissipation	T_A=25°C	P_D	0.51		W
	T_A=70°C		0.33		
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150		°C

Thermal Data

Parameter	Symbol	Steady State	Unit
Thermal Resistance, Junction-to-ambient	$R_{\theta JA}$	245	°C/W

Note:
*a. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150℃. Ratings are based on low frequency and low duty cycles to keep initial TJ=25℃.
*b. Human body model, 1.5kΩ in series with 100pF.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	0.4	-	1.2		V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	0.8	-	S	V_{DS}=5V, I_D=0.2A
I_{GSS}	-	-	±10	μA	V_{GS}=±8V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS}=16V, V_{GS}=0V
$R_{DS(ON)}$	-	0.32	0.45	Ω	V_{GS}=4.5V, I_D=0.2A
	-	0.4	0.6		V_{GS}=2.5V, I_D=0.2A
	-	0.7	1.2		V_{GS}=1.8V, I_D=10mA
Dynamic					
Ciss	-	33	-	pF	V_{DS}=10V, V_{GS}=0V, f=1MHz
Coss	-	15	-		
Crss	-	13	-		
Qg *1, 2	-	0.9	-	nC	V_{DS}=20V, I_D=0.6A, V_{GS}=4.5V
Qgs *1, 2	-	0.2	-		
Qgd *1, 2	-	0.2	-		
$t_{d(ON)}$ *1, 2	-	5	-	ns	V_{DS}=10V, I_D=0.2A, V_{GS}=4.5V, R_{GS}=10Ω
tr *1, 2	-	17	-		
$t_{d(OFF)}$ *1, 2	-	20	-		
t_f *1, 2	-	20	-		
Source-Drain Diode					
V_{SD} *1	-	0.85	1.2	V	I_S=0.2A, V_{GS}=0V
trr	-	5	-	ns	I_F=0.5A, dI_F/dt=100A/μs
Qrr	-	1	-	nC	

Note:

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

*2. Independent of operating temperature

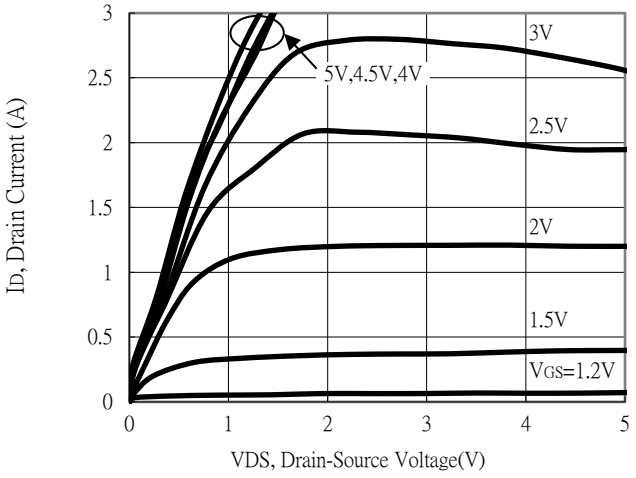
P-Channel Electrical Characteristics (T_A=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-20	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-0.4	-	-1.2		V_{DS}=V_{GS}, I_D=-250μA
G_{FS}	-	1	-	S	V_{DS}=-5V, I_D=-0.4A
I_{GSS}	-	-	±10	μA	V_{GS}=±8V, V_{DS}=0V
I_{DSS}	-	-	-1		V_{DS}=-16V, V_{GS}=0V
$R_{DS(ON)}$	-	0.75	1.1	Ω	V_{GS}=-4.5V, I_D=-0.2A
	-	0.9	1.5		V_{GS}=-2.5V, I_D=-0.2A
	-	1.1	2.5		V_{GS}=-1.8V, I_D=-10mA
Dynamic					
Ciss	-	45	-	pF	V_{DS}=-10V, V_{GS}=0V, f=1MHz
Coss	-	15	-		
Crss	-	8	-		
Qg *1, 2	-	1	-	nC	V_{DS}=-20V, I_D=-0.4A, V_{GS}=-4.5V
Qgs *1, 2	-	0.2	-		
Qgd *1, 2	-	0.2	-		
$t_{d(ON)}$ *1, 2	-	11	-	ns	V_{DS}=-10V, I_D=-0.2A, V_{GS}=-4.5V, R_{GS}=10Ω
tr *1, 2	-	20	-		
$t_{d(OFF)}$ *1, 2	-	45	-		
t_f *1, 2	-	35	-		
Source-Drain Diode					
V_{SD} *1	-	-0.9	-1.2	V	I_S=-0.4A, V_{GS}=0V

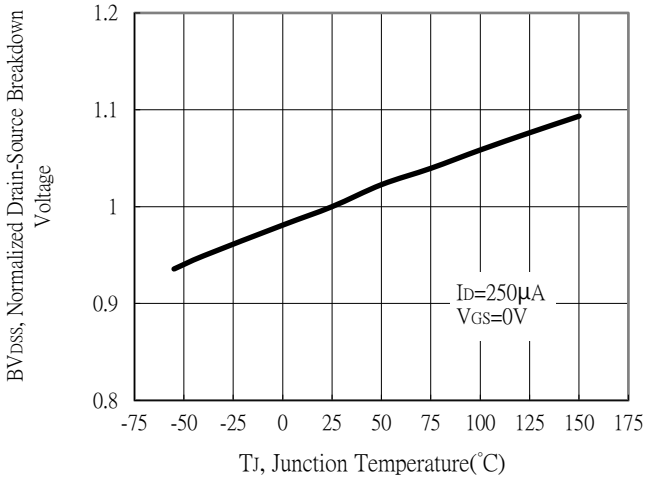
Note:
*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2. Independent of operating temperature

Typical Characteristics : Q1(N-channel)

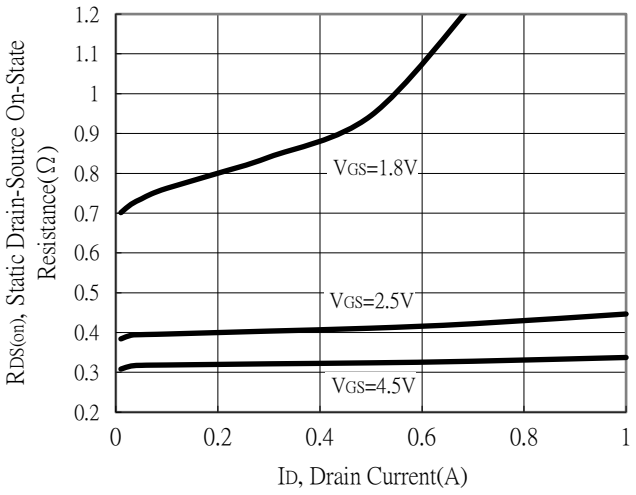
Typical Output Characteristics



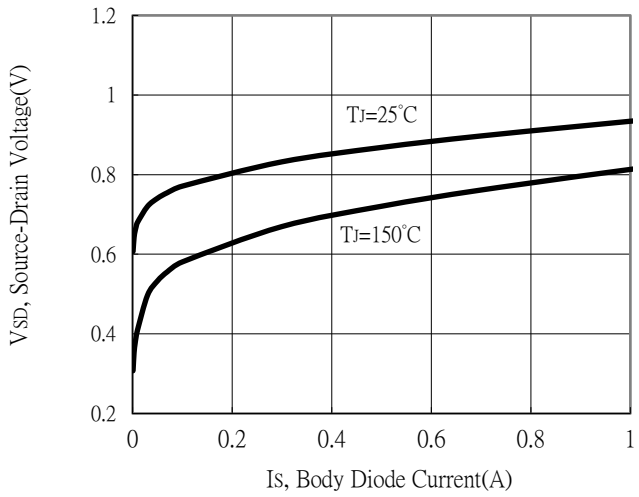
Breakdown Voltage vs Junction Temperature



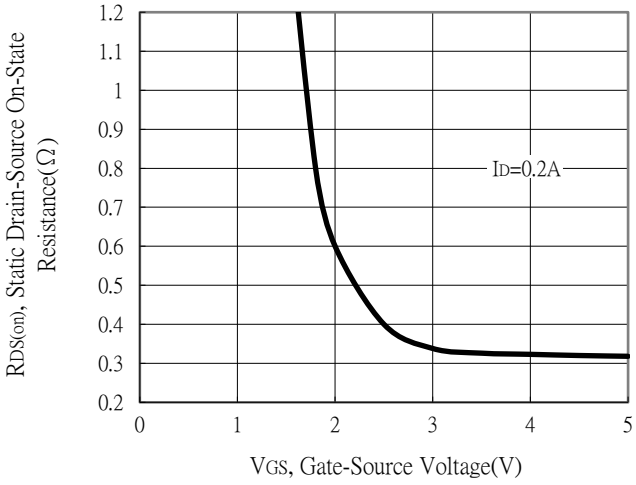
Static Drain-Source On-State resistance vs Drain Current



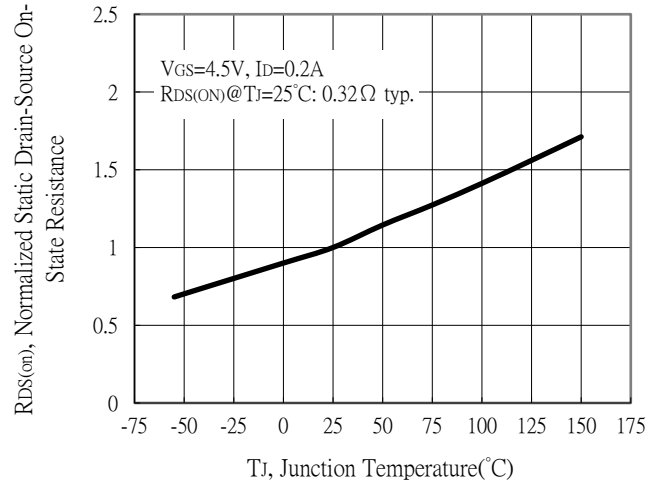
Body Diode Current vs Source-Drain Voltage



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

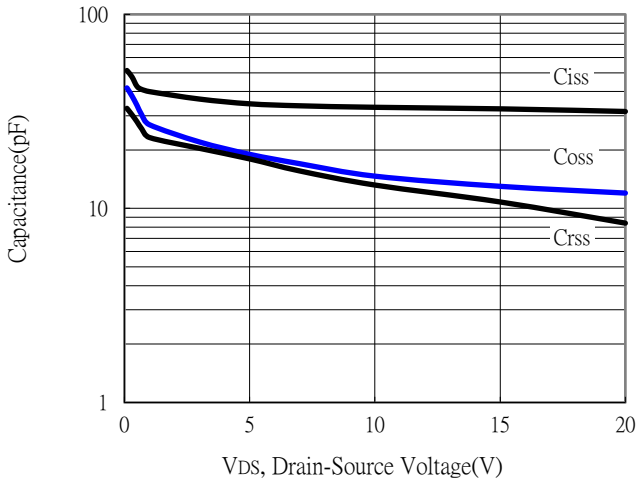


Drain-Source On-State Resistance vs Junction Temperature

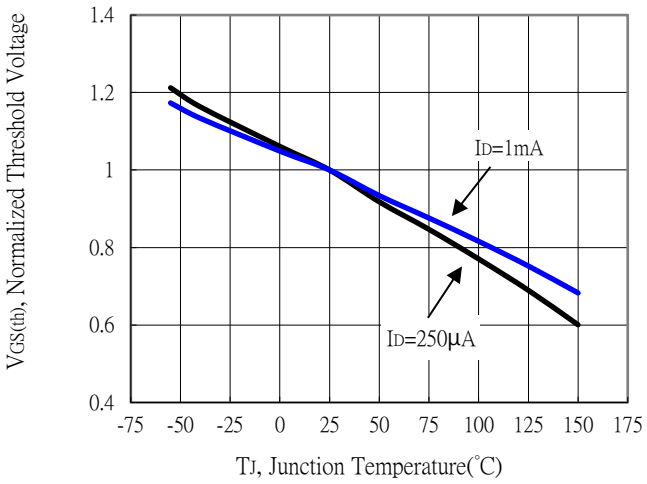


Typical Characteristics (Cont.) : Q1(N-channel)

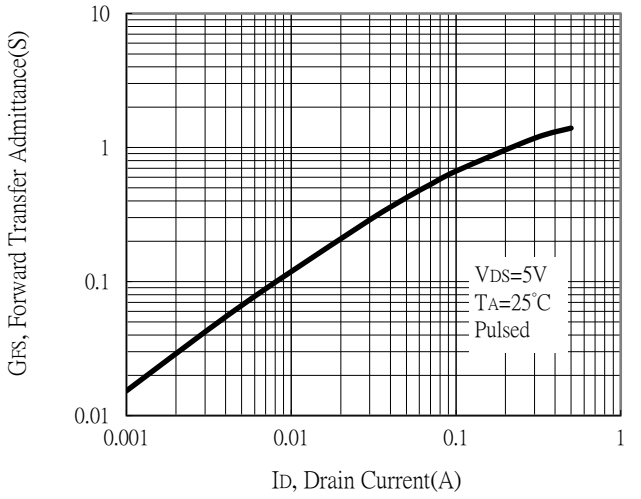
Capacitance vs Drain-to-Source Voltage



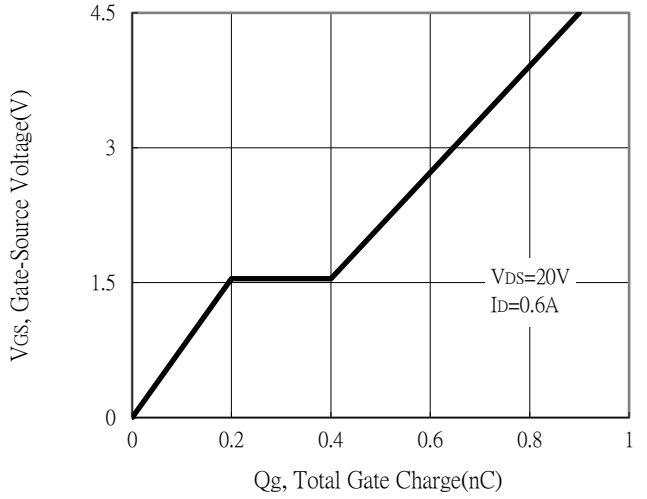
Threshold Voltage vs Junction Temperature



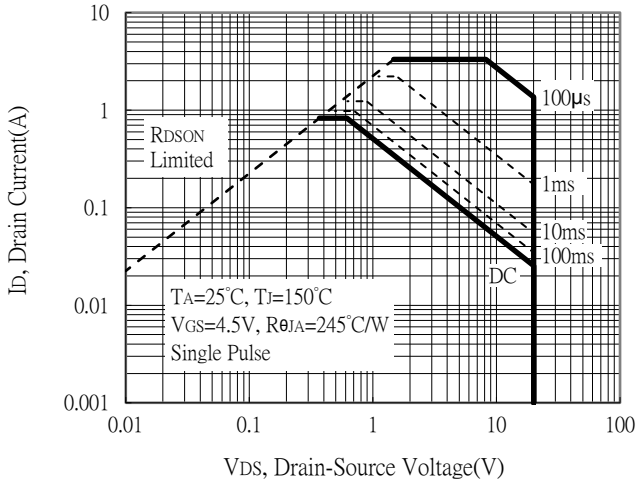
Forward Transfer Admittance vs Drain Current



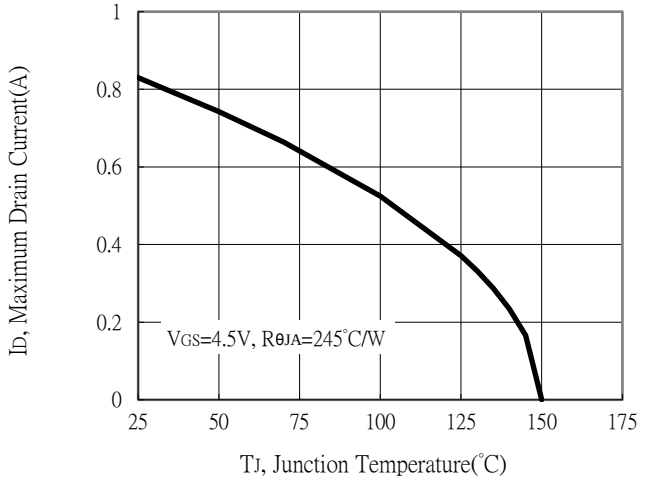
Gate Charge Characteristics



Maximum Safe Operating Area

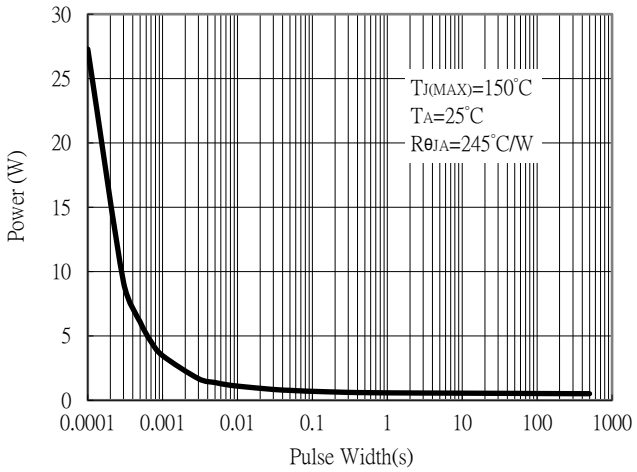


Maximum Drain Current vs Junction Temperature

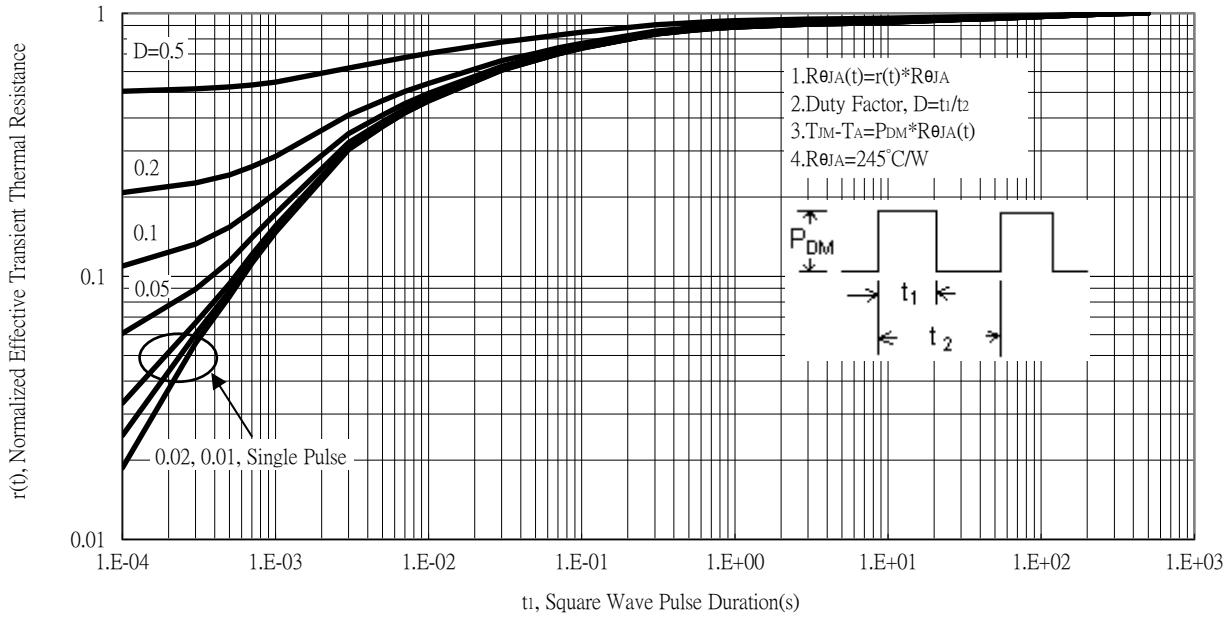


Typical Characteristics (Cont.) : Q1(N-channel)

Single Pulse Power Rating, Junction to Ambient

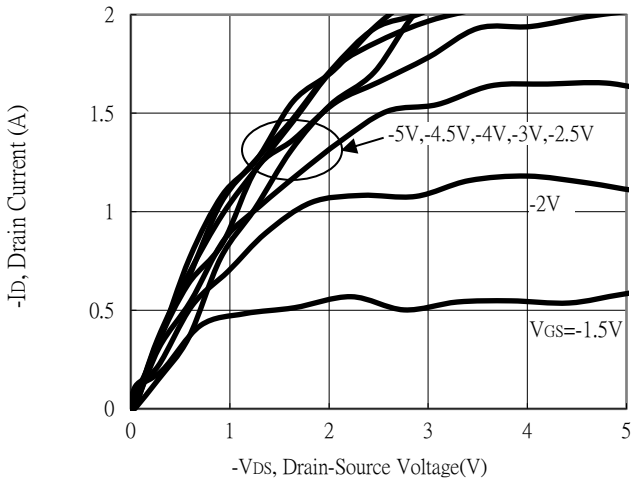


Transient Thermal Response Curves

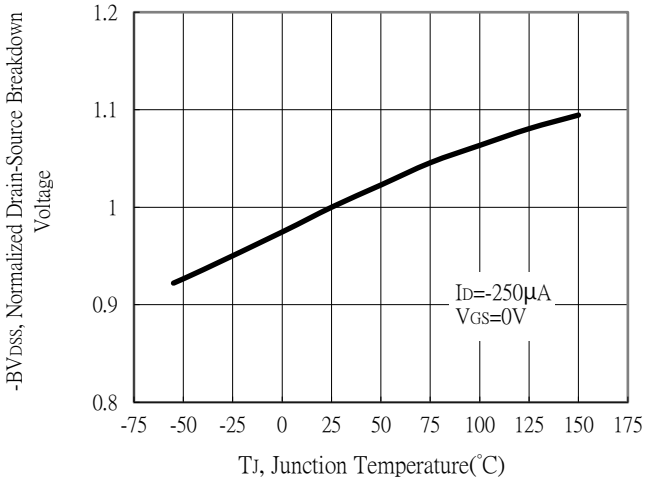


Typical Characteristics : Q2(P-channel)

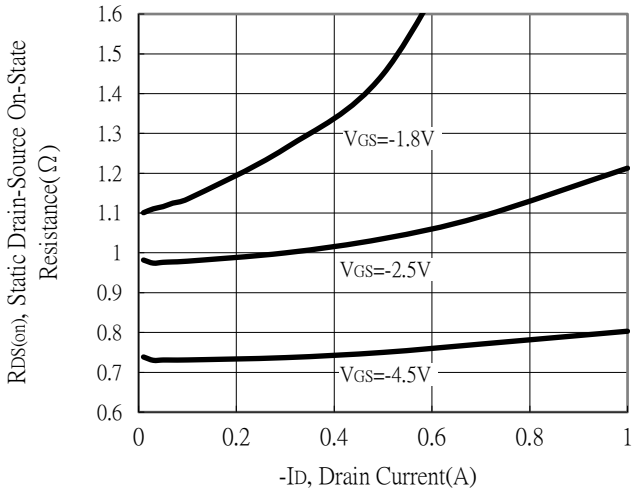
Typical Output Characteristics



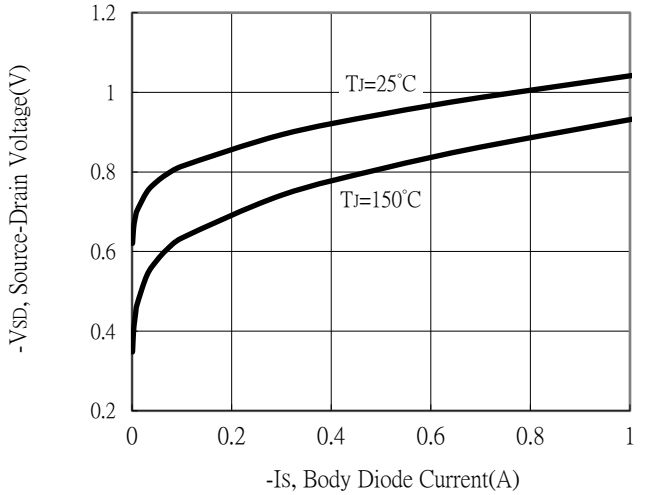
Breakdown Voltage vs Junction Temperature



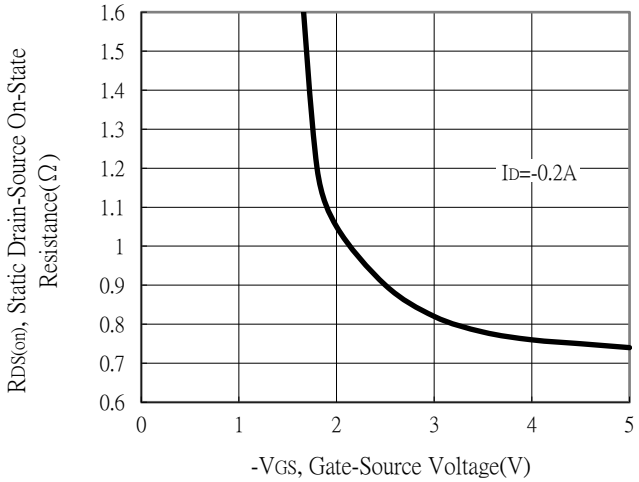
Static Drain-Source On-State resistance vs Drain Current



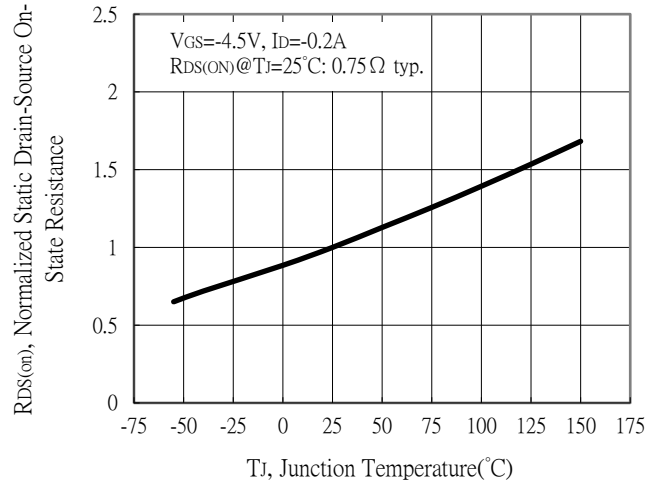
Body Diode Current vs Source-Drain Voltage



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

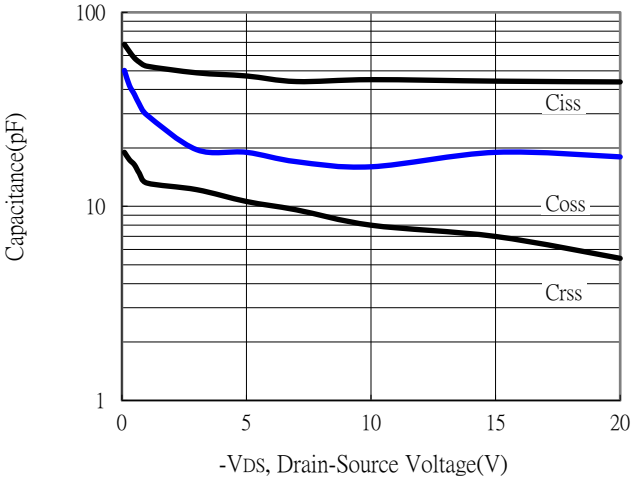


Drain-Source On-State Resistance vs Junction Temperature

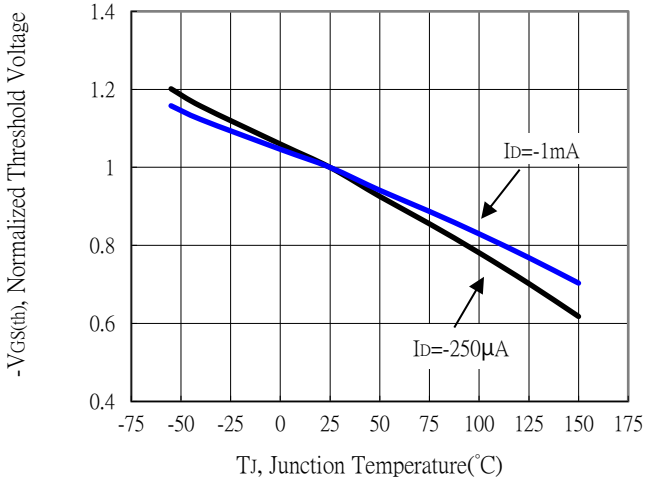


Typical Characteristics (Cont.) : Q2(P-channel)

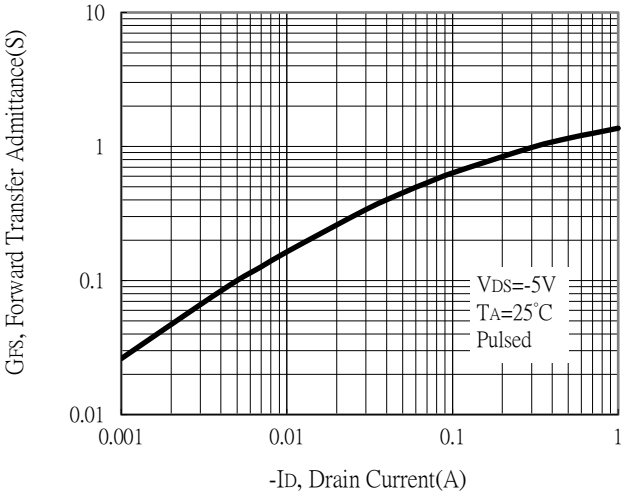
Capacitance vs Drain-to-Source Voltage



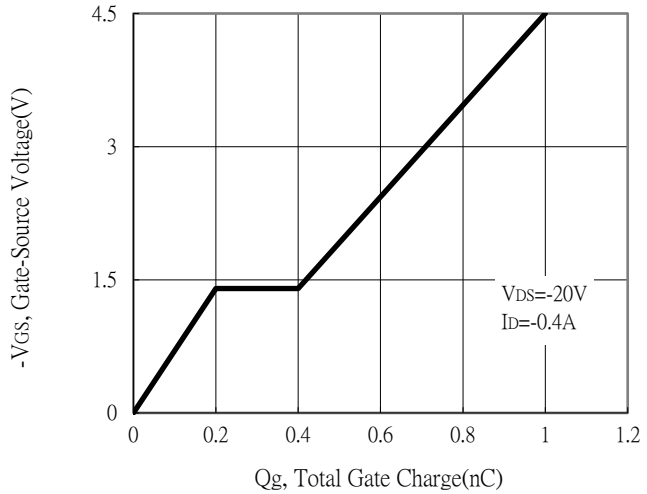
Threshold Voltage vs Junction Temperature



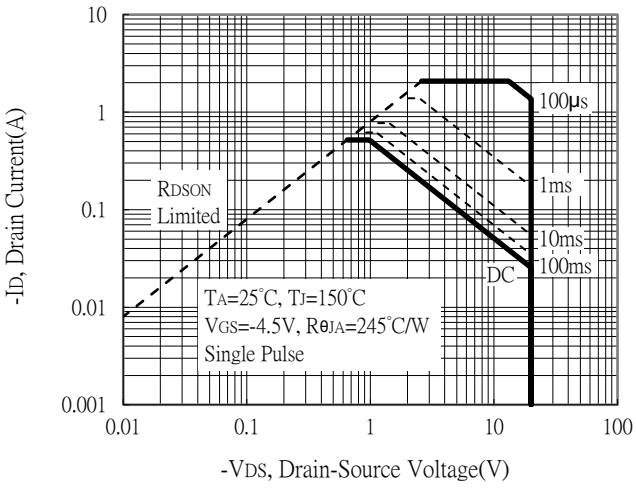
Forward Transfer Admittance vs Drain Current



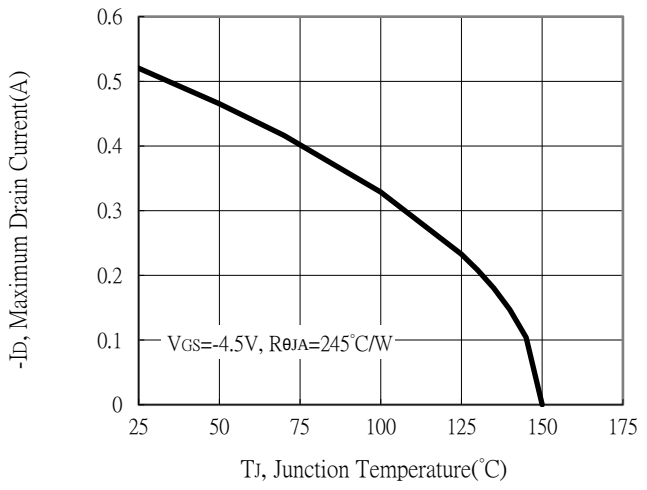
Gate Charge Characteristics



Maximum Safe Operating Area

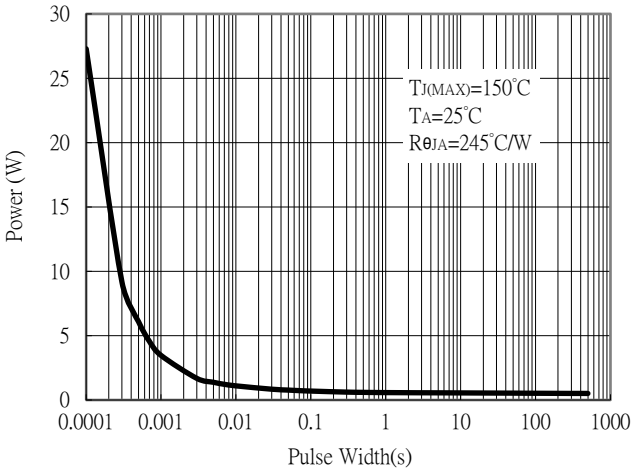


Maximum Drain Current vs Junction Temperature

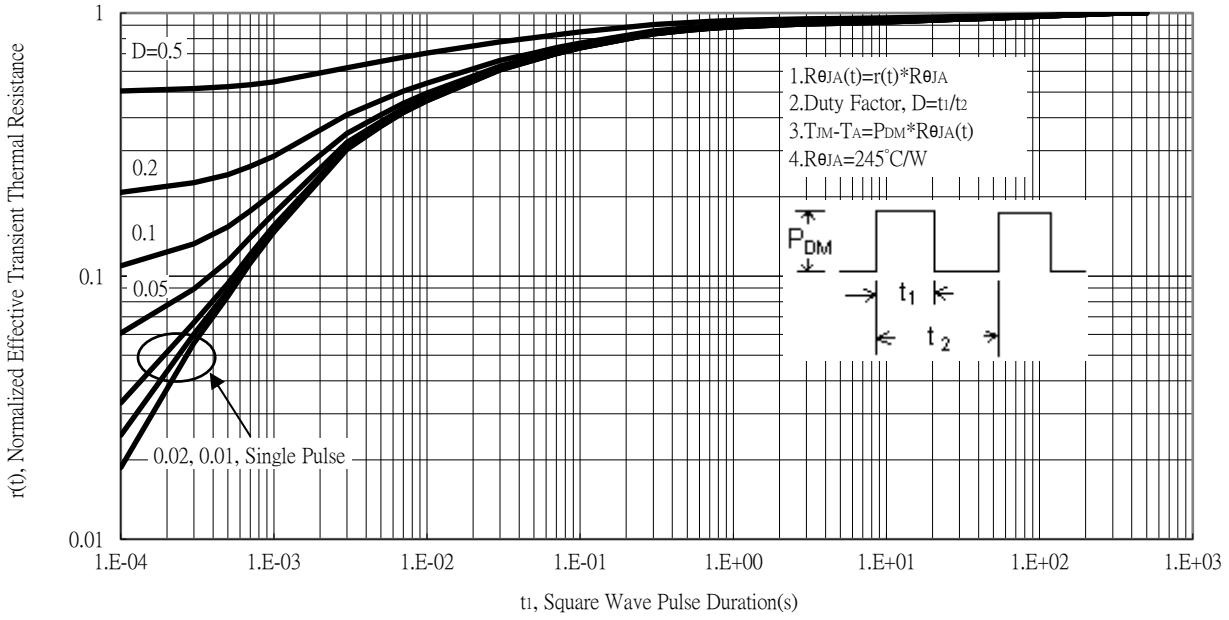


Typical Characteristics (Cont.) : Q2(P-channel)

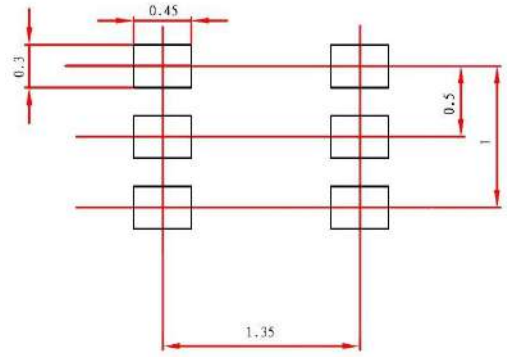
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

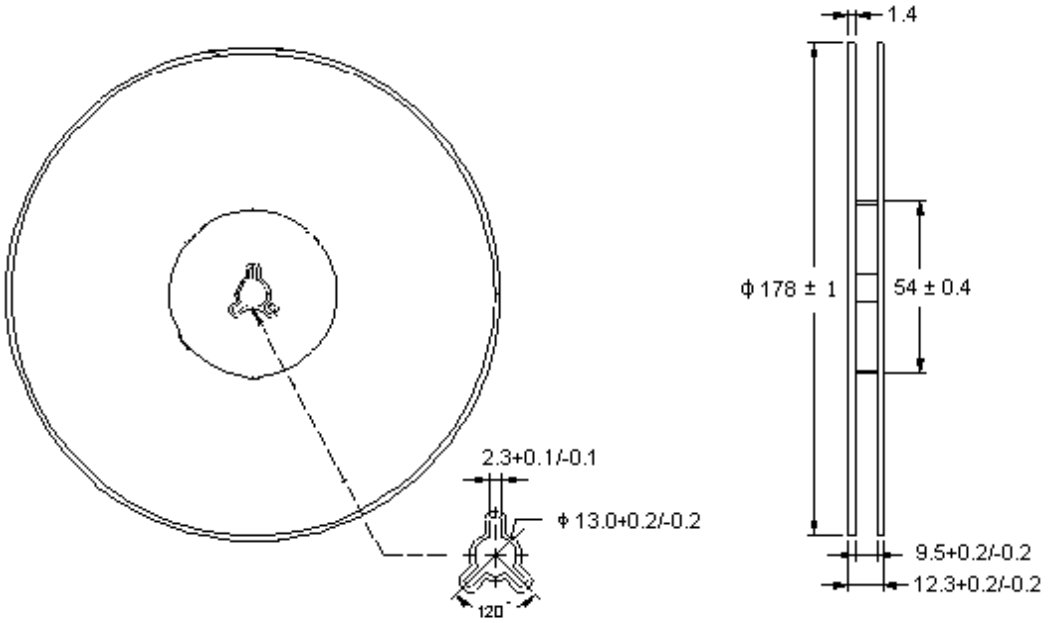


Recommended Soldering Footprint



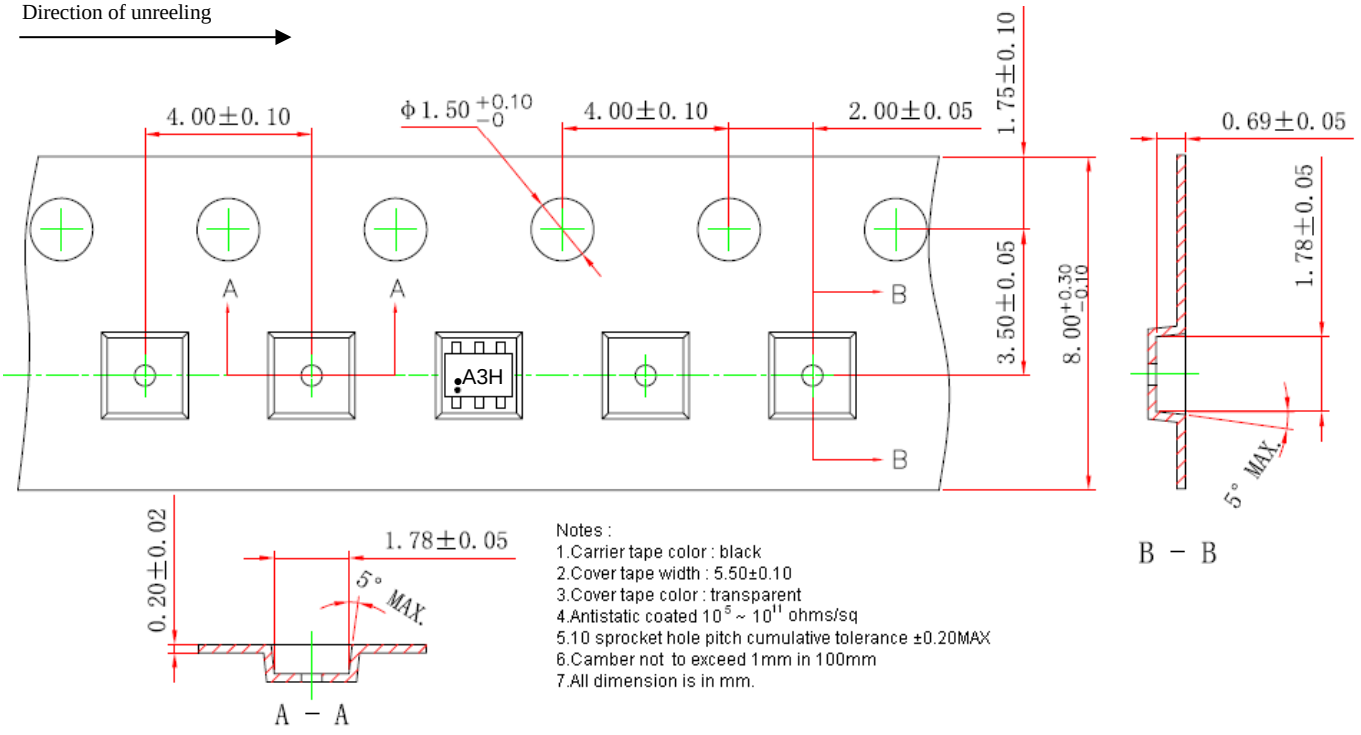
Unit : mm

Reel Dimension



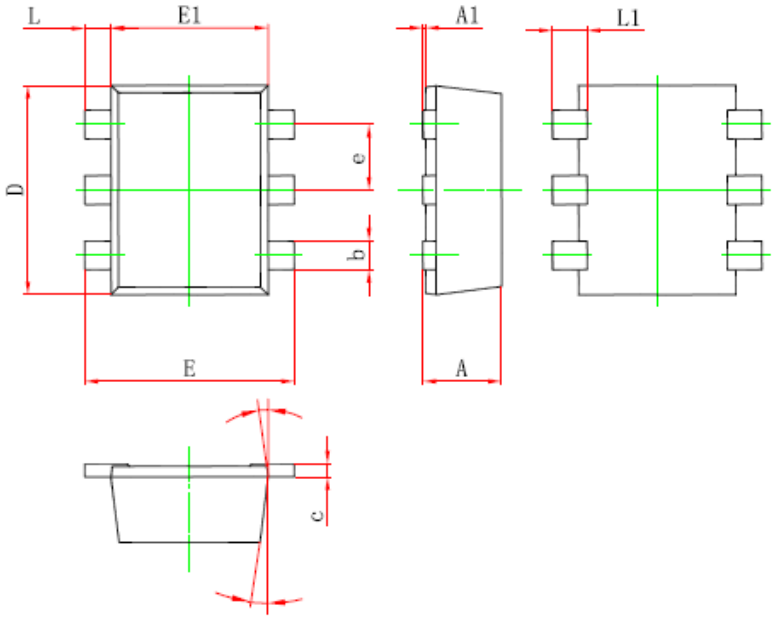
Unit: millimeter

Carrier Tape Dimension



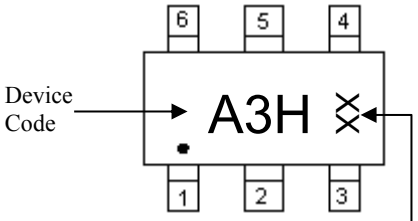
Notes :
1.Carrier tape color : black
2.Cover tape width : 5.50±0.10
3.Cover tape color : transparent
4.Antistatic coated 10^{5} ~ 10^{11} ohms/sq
5.10 sprocket hole pitch cumulative tolerance ±0.20MAX
6.Camber not to exceed 1mm in 100mm
7.All dimension is in mm.

SOT-563 Dimension



6-Lead SOT-563 Plastic
Surface Mounted Package

Marking:



Date Code: Year+Month
Year: 6→2006, 7→2007
Month: 1→1, 2→2, • • •
9→9, A→10, B→11, C→12

Style:
Pin 1. Source1 (S1)
Pin 2. Gate1 (G1)
Pin 3. Drain2 (D2)
Pin 4. Source2 (S2)
Pin 5. Gate2 (G2)
Pin 6. Drain1 (D1)

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.021	0.024	0.525	0.600	E1	0.043	0.051	1.100	1.300
A1	0.000	0.002	0.000	0.050	E	0.059	0.067	1.500	1.700
e	0.018	0.022	0.450	0.550	L	0.004	0.012	0.100	0.300
c	0.004	0.006	0.090	0.160	L1	0.008	0.016	0.200	0.400
D	0.059	0.067	1.500	1.700	θ	7°	REF	7°	REF
b	0.007	0.011	0.170	0.270					