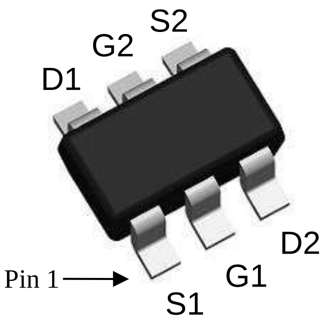
N- AND P-Channel Enhancement Mode Power MOSFET

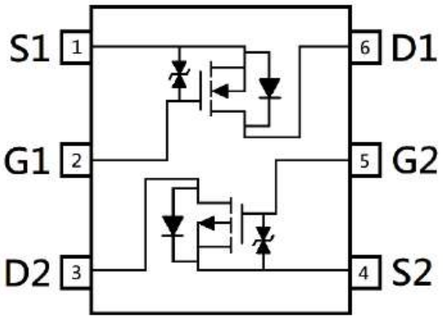
Features:

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

SOT-363



	N-CH	P-CH
BV$_{DSS}$	30V	-30V
I$_D$@V$_{GS}$=(-)4.5V, T$_A$=25°C	0.57A	-0.44A
R$_{DS(ON)}$ typ. @ V$_{GS}$=(-)4.5V	0.5Ω	0.9Ω
R$_{DS(ON)}$ typ. @ V$_{GS}$=(-)2.5V	0.6Ω	1.1Ω
R$_{DS(ON)}$ typ. @ V$_{GS}$=(-)1.8V	0.9Ω	1.3Ω



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KWA500C03K	SOT-363 (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}	30	-30	V
Gate-Source Voltage		V_{GS}	±8	±8	
Continuous Drain Current @ V_{GS}=(-)4.5V, T_A=25°C		I_D	0.57	-0.44	A
Continuous Drain Current @ V_{GS}=(-)4.5V, T_A=70°C			0.46	-0.35	
Pulsed Drain Current *a		I_{DM}	2.2	-1.8	
Continuous Body Diode Forward Current @ T_A=25°C		I_S	0.35	-0.35	
ESD susceptibility *b		V_{ESD}	4000	4000	V
Total Power Dissipation	T_A=25°C	P_D	0.42		W
	T_A=70°C		0.27		
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	$R_{\theta JA}$	300	°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}	30	-	-	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}=24V, V_{GS}=0V
$R_{DS(ON)}$	-	0.5	0.7	Ω	V_{GS}=4.5V, I_D=0.2A
	-	0.6	0.9		V_{GS}=2.5V, I_D=0.2A
	-	0.9	2		V_{GS}=1.8V, I_D=10mA
Dynamic					
Ciss	-	31	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	11	-		
Crss	-	8	-		
Qg *1, 2	-	0.9	-	nC	V_{DS}=20V, I_D=0.2A, V_{GS}=4.5V
Qgs *1, 2	-	0.2	-		
Qgd *1, 2	-	0.2	-		
$t_{d(ON)}$ *1, 2	-	5.3	-	ns	V_{DS}=15V, I_D=0.2A, V_{GS}=4.5V, R_{GS}=6Ω
tr *1, 2	-	16	-		
$t_{d(OFF)}$ *1, 2	-	20	-		
t_f *1, 2	-	18	-		
Source-Drain Diode					
V_{SD} *1	-	0.85	1.2	V	I_S=0.2A, V_{GS}=0V
trr	-	4.7	-	ns	I_F=0.5A, dI_F/dt=100A/μs
Qrr	-	1.2	-	nC	

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

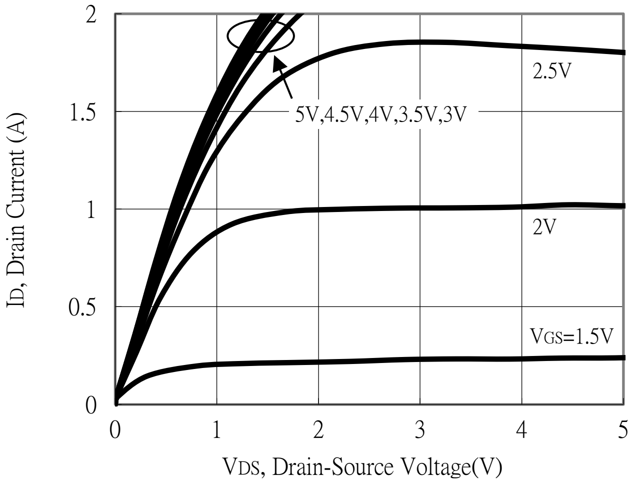
P-Channel Electrical Characteristics (T_A=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	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}=-24V, V_{GS}=0V
$R_{DS(ON)}$	-	0.9	1.3	Ω	V_{GS}=-4.5V, I_D=-0.2A
	-	1.1	1.7		V_{GS}=-2.5V, I_D=-0.2A
	-	1.3	2.7		V_{GS}=-1.8V, I_D=-10mA
Dynamic					
Ciss	-	46	-	pF	V_{DS}=-15V, V_{GS}=0V, f=1MHz
Coss	-	13	-		
Crss	-	10	-		
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	-	13	-	ns	V_{DS}=-15V, I_D=-0.4A, V_{GS}=-4.5V, R_{GS}=1Ω
tr *1, 2	-	21	-		
$t_{d(OFF)}$ *1, 2	-	44	-		
t_f *1, 2	-	29	-		
Source-Drain Diode					
V_{SD} *1	-	-0.85	-1.2	V	I_S=-0.2A, V_{GS}=0V
trr	-	25	-	ns	I_F=-0.5A, dI_F/dt=100A/μs
Qrr	-	5	-	nC	

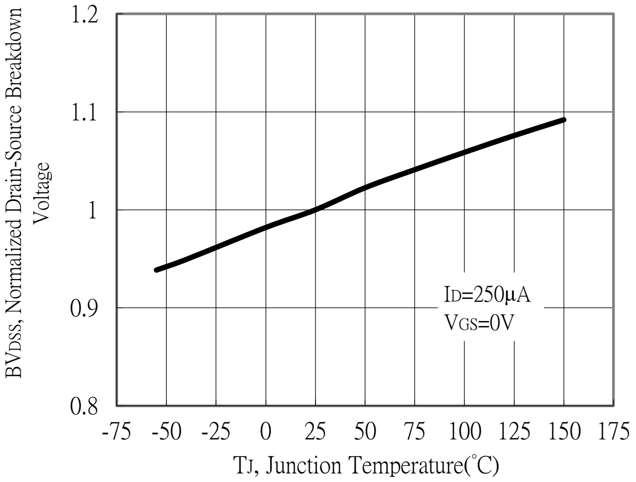
Note:
*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2. Independent of operating temperature

Typical Characteristics : Q1(N-channel)

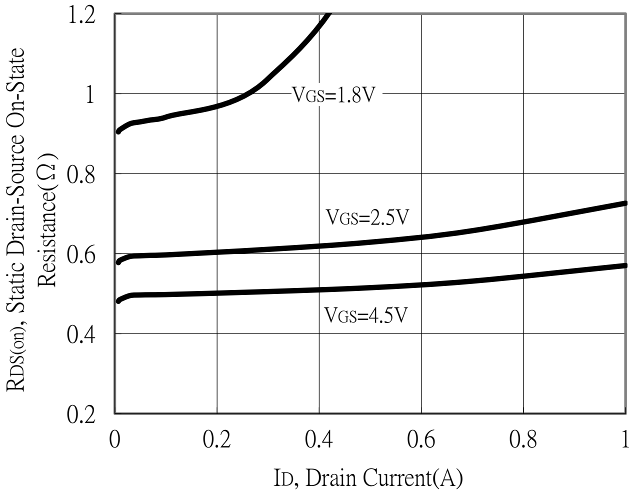
Typical Output Characteristics



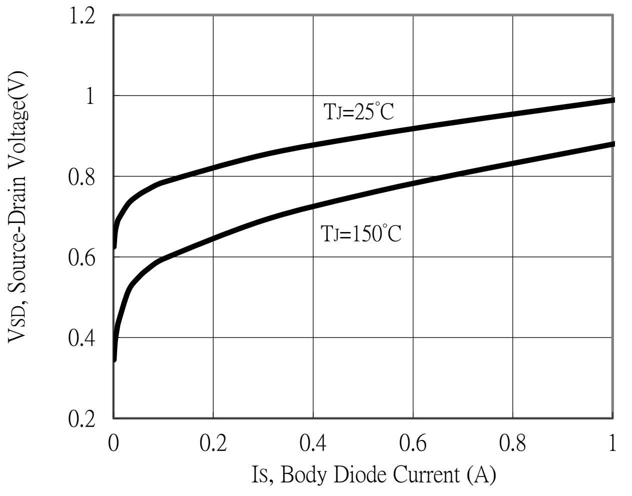
Breakdown Voltage vs Ambient Temperature



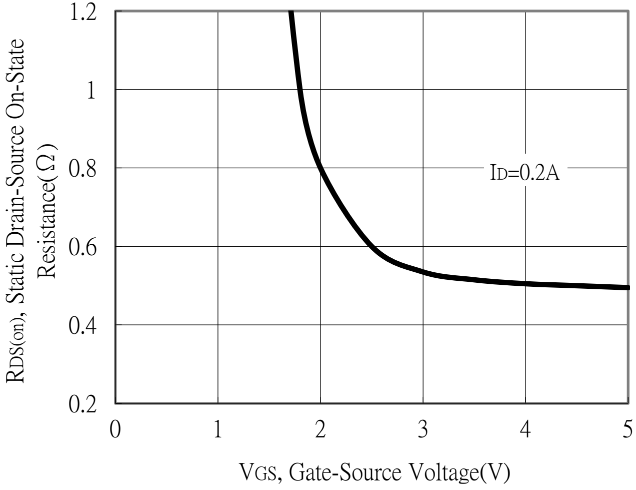
Static Drain-Source On-State resistance vs Drain Current



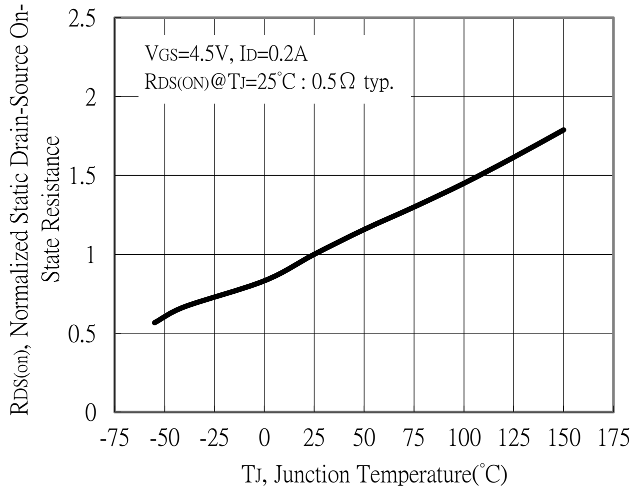
Body Diode Current vs Source-Drain Voltage



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

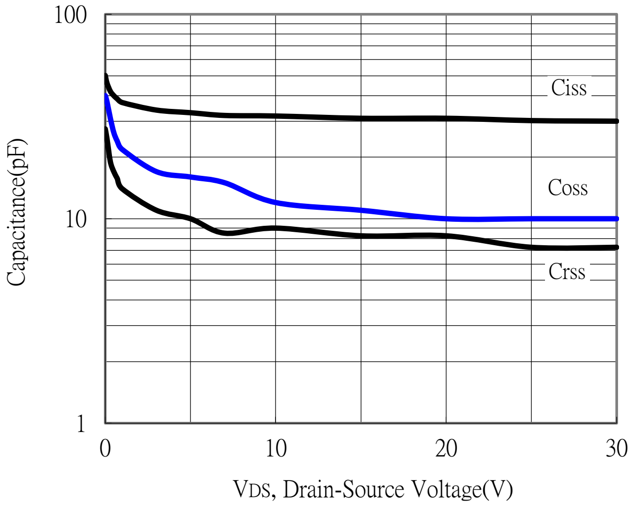


Drain-Source On-State Resistance vs Junction Temperature

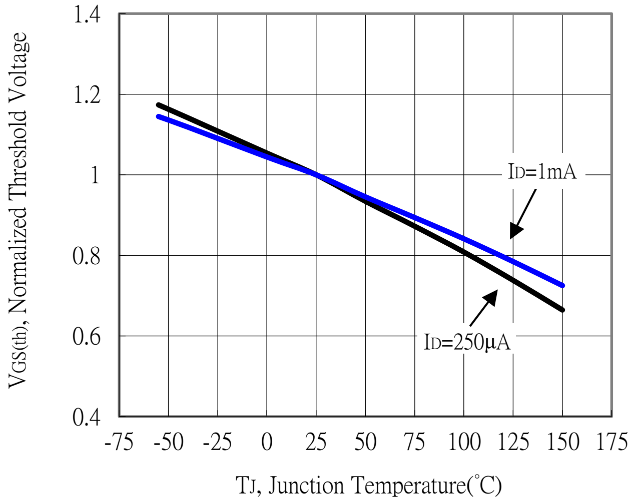


Typical Characteristics (Cont.) : Q1(N-channel)

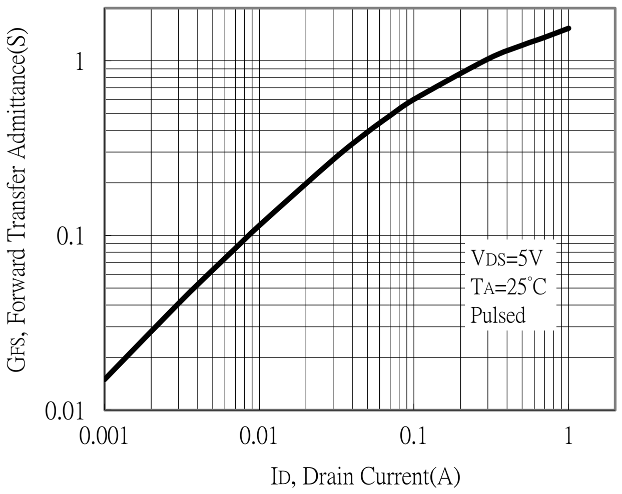
Capacitance vs Drain-to-Source Voltage



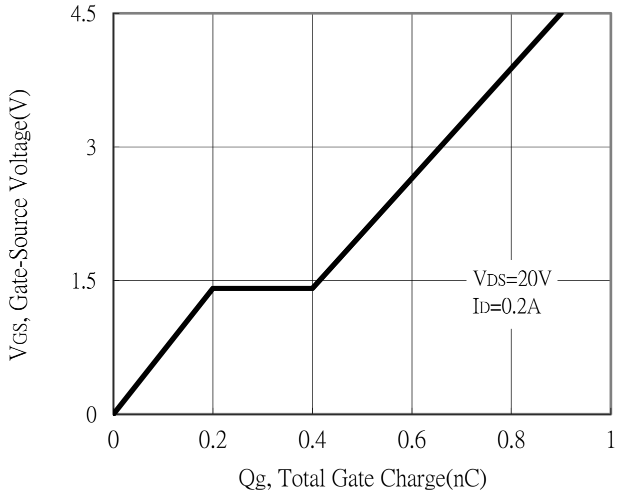
Threshold Voltage vs Junction Temperature



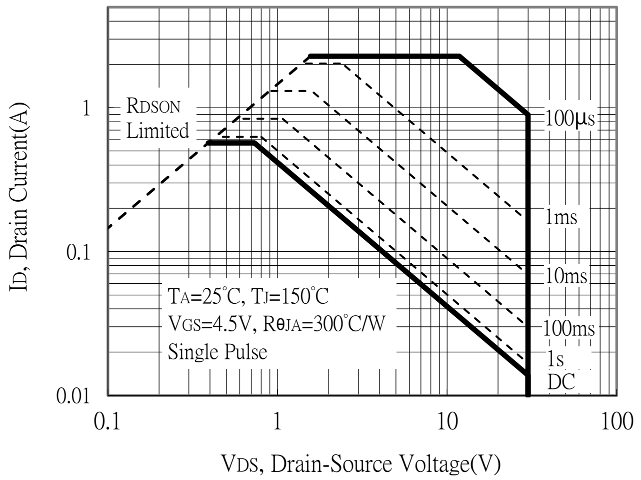
Forward Transfer Admittance vs Drain Current



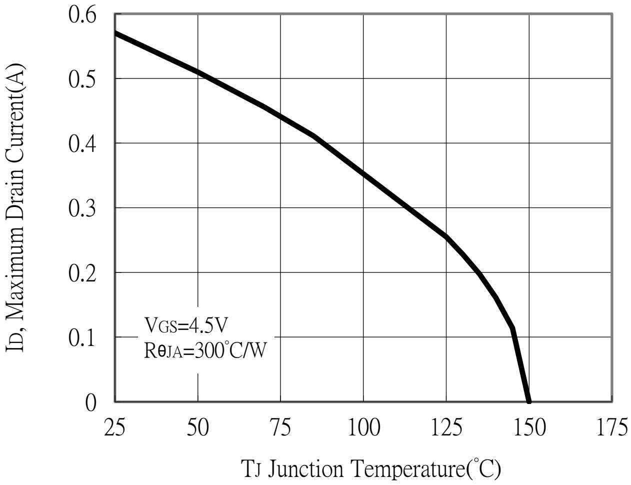
Gate Charge Characteristics



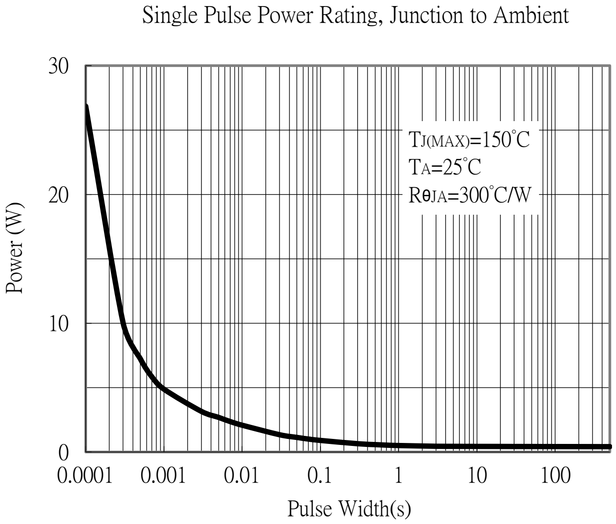
Maximum Safe Operating Area

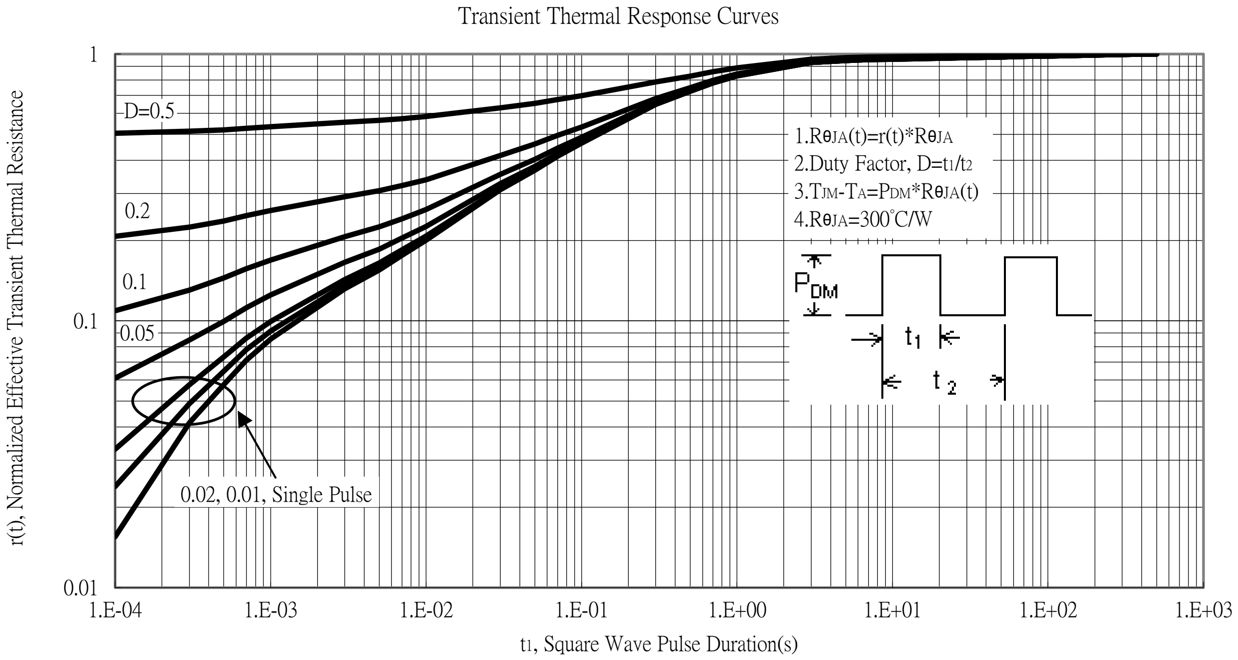


Maximum Drain Current vs Junction Temperature



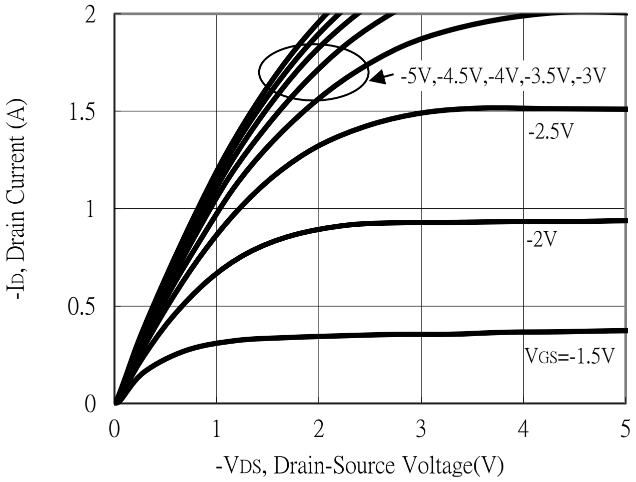
Typical Characteristics (Cont.) : Q1(N-channel)



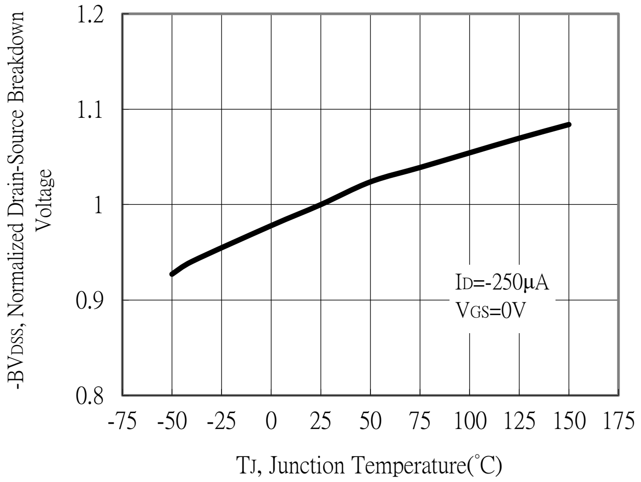


Typical Characteristics : Q2(P-channel)

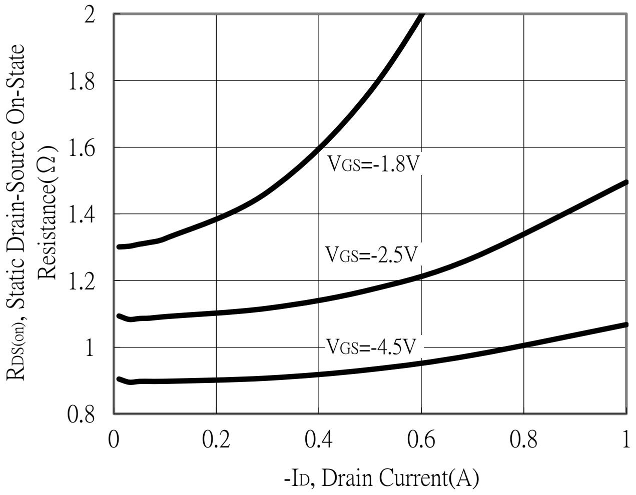
Typical Output Characteristics



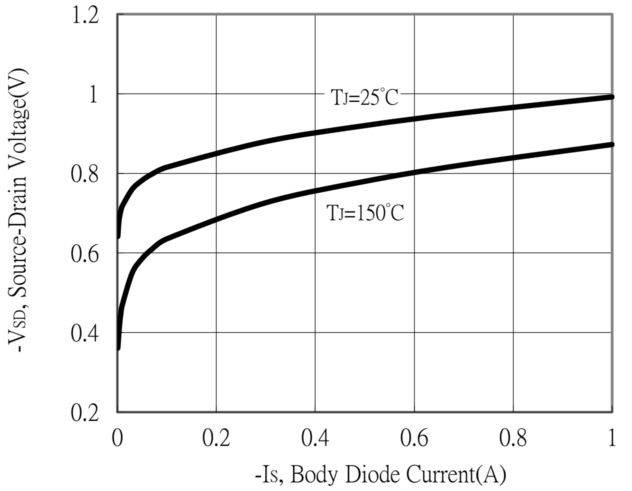
Breakdown Voltage vs Ambient Temperature



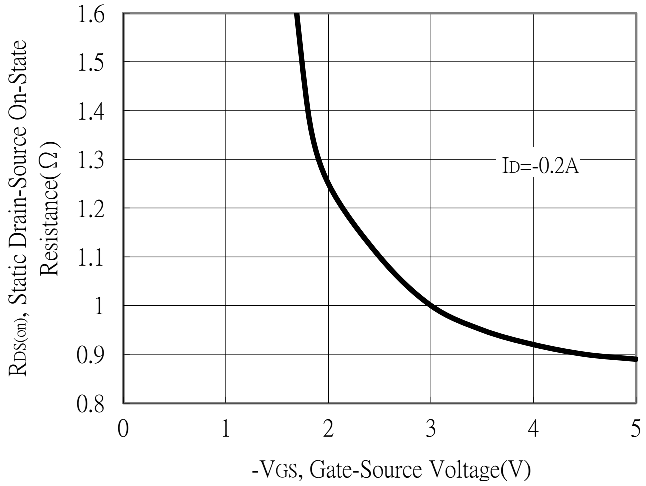
Static Drain-Source On-State resistance vs Drain Current



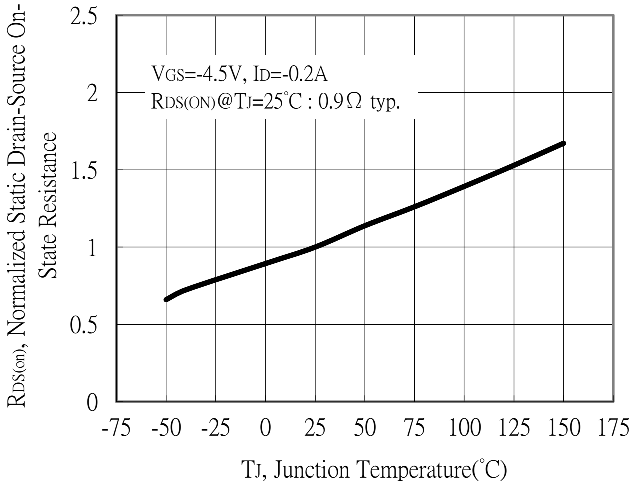
Body Diode Currentvs Source-Drain Voltage



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

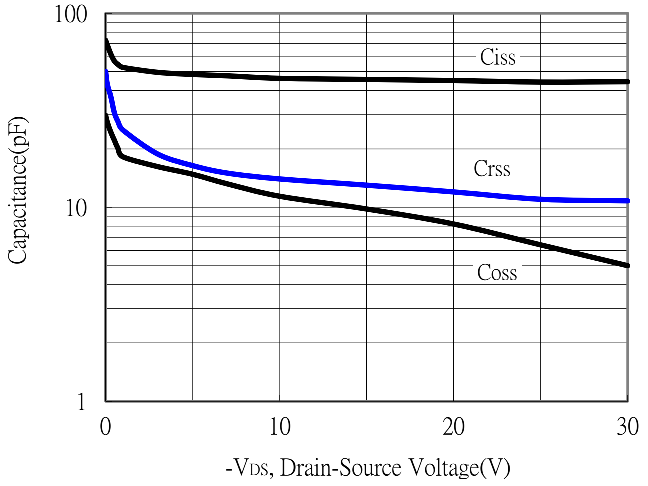


Drain-Source On-State Resistance vs Junction Temperature

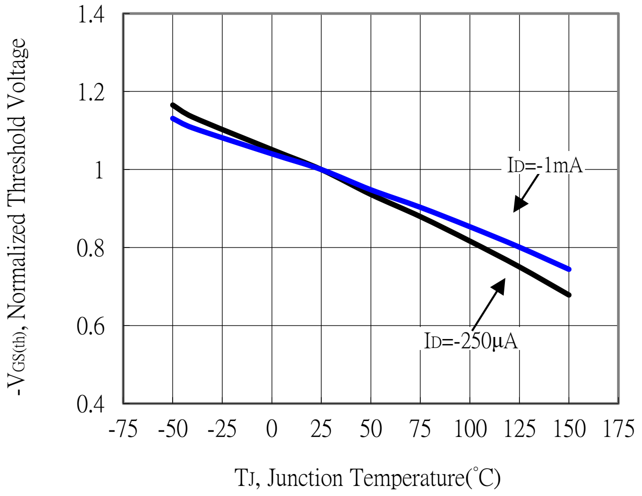


Typical Characteristics (Cont.) : Q2(P-channel)

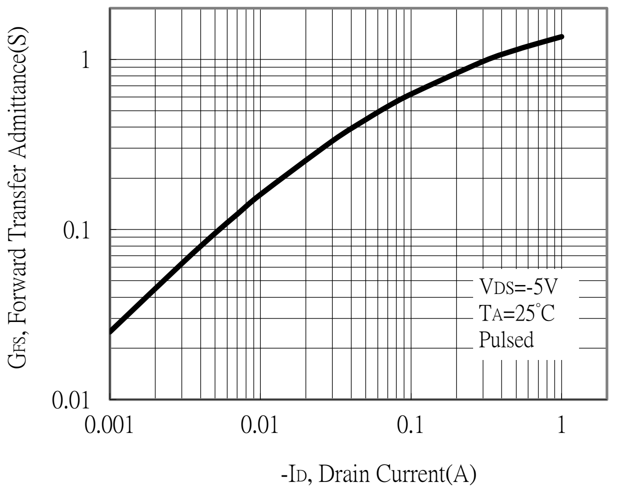
Capacitance vs Drain-to-Source Voltage



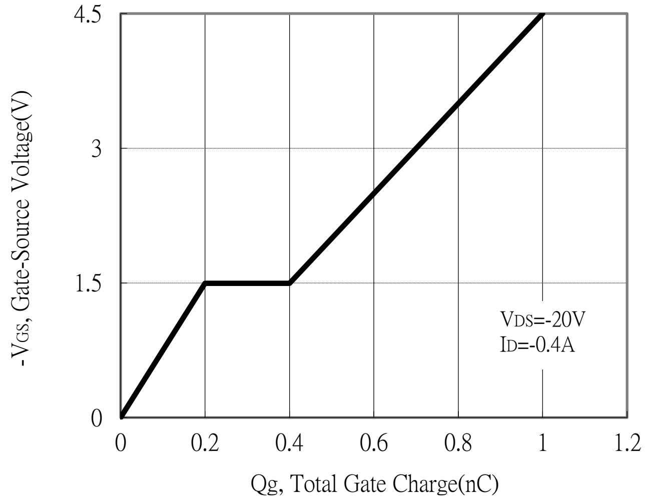
Threshold Voltage vs Junction Temperature



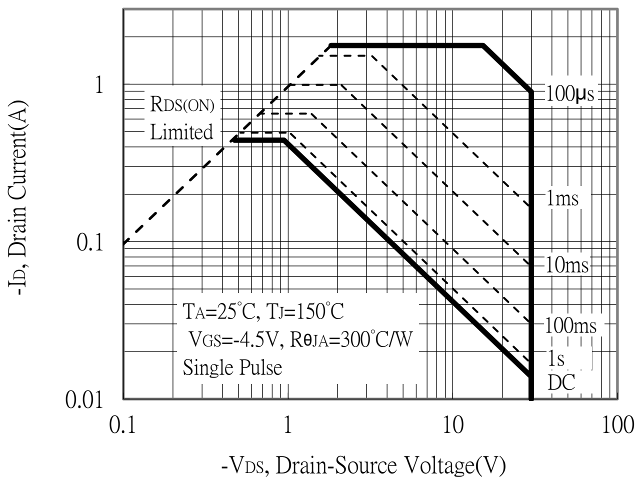
Forward Transfer Admittance vs Drain Current



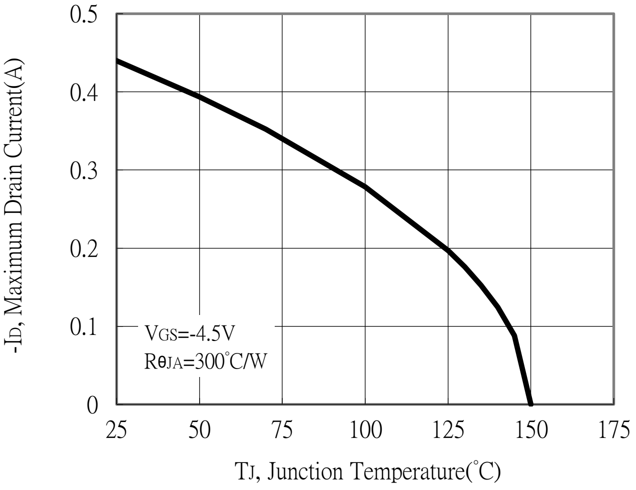
Gate Charge Characteristics



Maximum Safe Operating Area

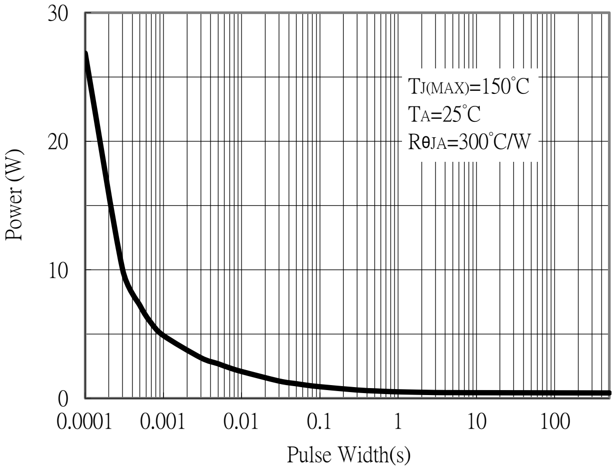


Maximum Drain Current vs Junction Temperature

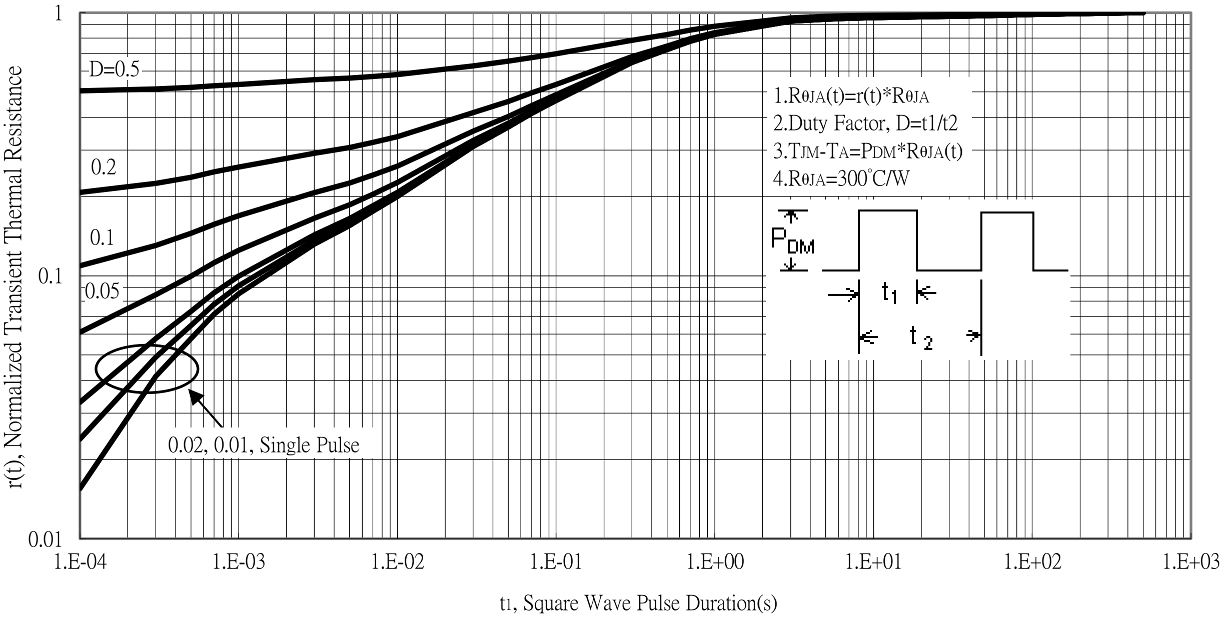


Typical Characteristics (Cont.) : Q2(P-channel)

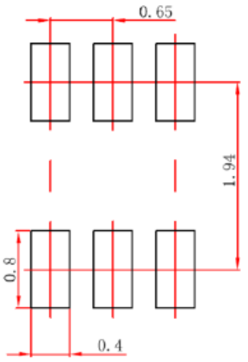
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

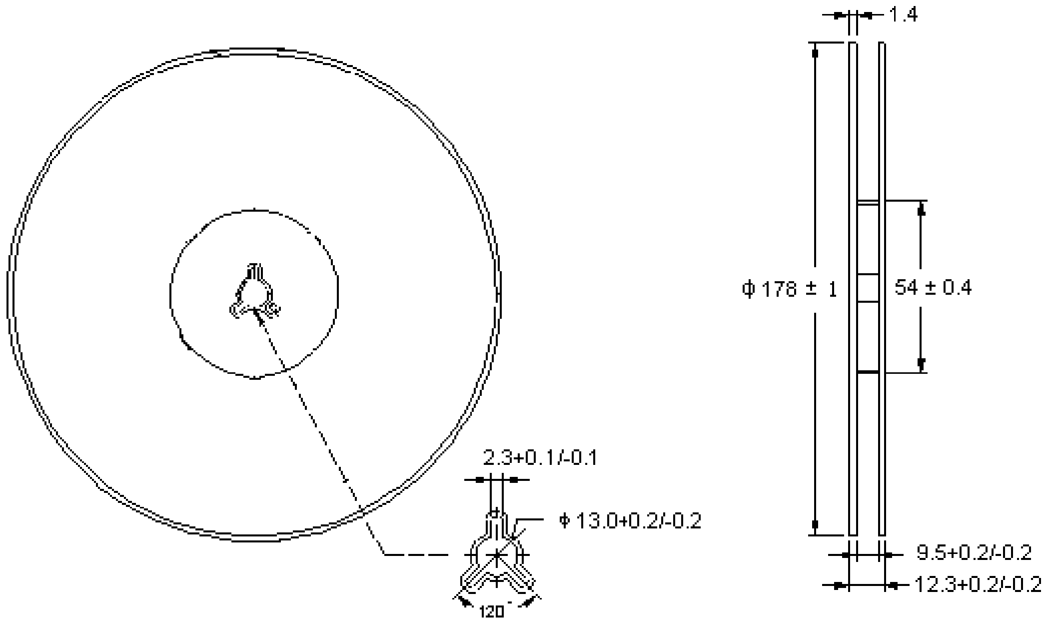


Recommended Soldering Footprint



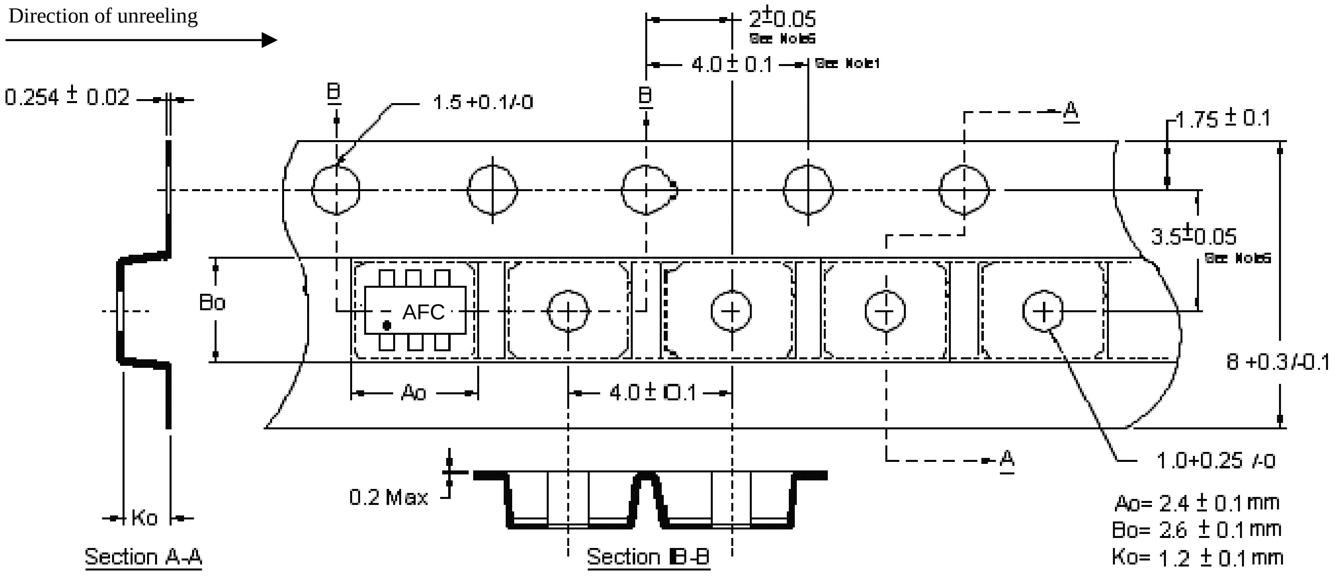
unit:mm

Reel Dimension



Unit: millimeter

Carrier Tape Dimension

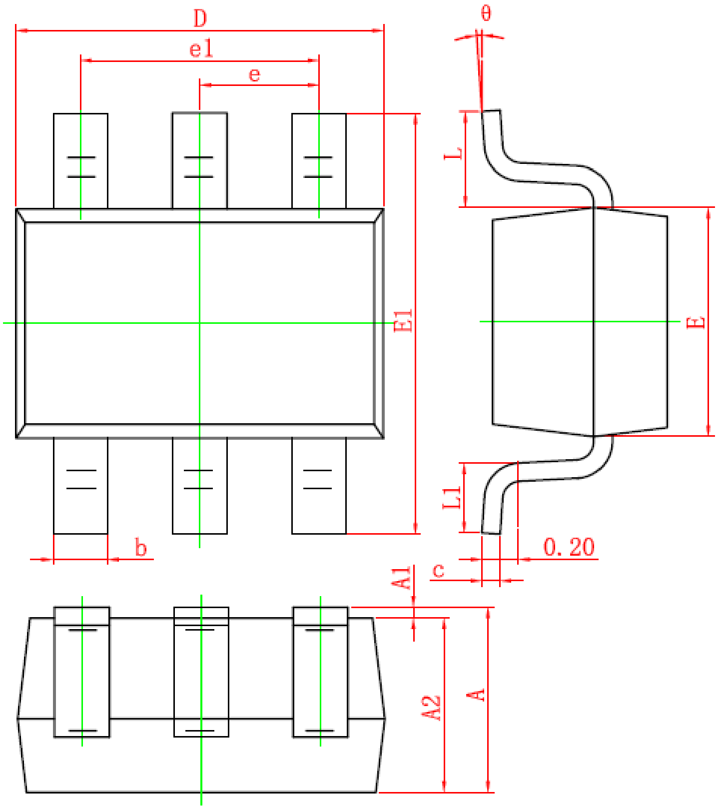


Notes:

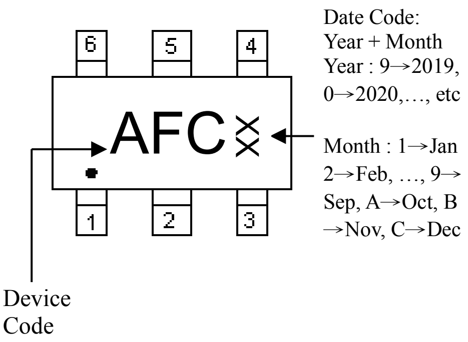
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6.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

Unit : millimeter

SOT-363 Dimension



Marking:



6-Lead SOT-363 Plastic
Surface Mounted Package

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	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650	TYP	0.026	TYP
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.150	0.350	0.006	0.014	L	0.525	REF	0.021	REF
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					