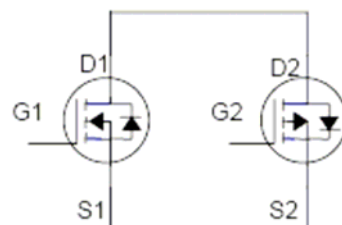
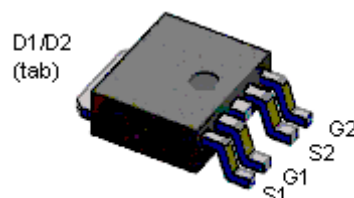


N & P-Channel Enhancement Mode Power MOSFET

Features:

- Low Gate Charge
- Simple Drive Requirement
- RoHS compliant & Halogen-free package

TO-252-4L



G : Gate D : Drain
 S : Source

	N-CH	P-CH
BV_{DSS}	30V	-30V
$I_D @ T_C=25^{\circ}C, V_{GS}=10V(-10V)$	29.1A	-21.2A
$I_D @ T_A=25^{\circ}C, V_{GS}=10V(-10V)$	7.5A	-5.5A
$R_{DS(on)(MAX)} @ V_{GS}=10V(-10V)$	18m Ω	36m Ω
$R_{DS(on)(MAX)} @ V_{GS}=4.5V(-4.5V)$	27m Ω	60m Ω

Absolute Maximum Ratings ($T_A=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Limits		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	
Continuous Drain Current @ $T_C=25^{\circ}C, V_{GS}=10V(-10V)$ for P-CH)	I_D	29.1	-21.2	A
Continuous Drain Current @ $T_C=100^{\circ}C, V_{GS}=10V(-10V)$		20.6	-15.0	
Continuous Drain Current @ $T_A=25^{\circ}C, V_{GS}=10V(-10V)$		7.5	-5.5	
Continuous Drain Current @ $T_A=70^{\circ}C, V_{GS}=10V(-10V)$		6.3	-4.6	
Pulsed Drain Current *1	I_{DM}	40	-40	
Avalanche Current	I_{AS}	15	-15	
Avalanche Energy @ $L=0.1mH, I_b=15A(-15A)$ for P-ch), $R_G=25\Omega$	E_{AS}	11.3	11.3	mJ
Repetitive Avalanche Energy @ $L=0.05mH$ *2	E_{AR}	2.5	2.5	
Total Power Dissipation ($T_C=25^{\circ}C$)	P_D	25		W
Total Power Dissipation ($T_C=100^{\circ}C$)		12.5		
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55~+175		$^{\circ}C$

Note : *1. Pulse width limited by maximum junction temperature

*2. Duty cycle $\leq 1\%$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	6	°C/W
Thermal Resistance, Junction-to-ambient, max * 1	$R_{th,j-a}$	90	

Note : *1 62.5°C/W when mounted on a 1 in² pad of 2 oz copper.

N-CH Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
$V_{GS(th)}$	1.4	-	2.5		$V_{DS}=V_{GS}, I_D=250\mu A$
G_{FS} *1	-	9	-	S	$V_{DS}=5V, I_D=8A$
I_{GSS}	-	-	±100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
I_{DSS}	-	-	1	μA	$V_{DS}=24V, V_{GS}=0V$
	-	-	25		$V_{DS}=20V, V_{GS}=0V, T_j=125^\circ C$
$R_{DS(ON)}$ *1	-	13	18	mΩ	$V_{GS}=10V, I_D=8A$
	-	17	27		$V_{GS}=4.5V, I_D=6A$
Dynamic					
$Q_g(V_{GS}=10V)$ *1	-	12.3	-	nC	$I_D=8A, V_{DS}=15V, V_{GS}=10V$
$Q_g(V_{GS}=4.5V)$ *1	-	6.3	-		
Q_{gs} *1	-	1.9	-		
Q_{gd} *1	-	2.8	-		
$t_{d(ON)}$ *1	-	6.4	-	ns	$V_{DS}=15V, I_D=8A, V_{GS}=10V, R_G=1\Omega$
t_r *1	-	15.6	-		
$t_{d(OFF)}$ *1	-	27	-		
t_f *1	-	6.2	-	pF	$V_{GS}=0V, V_{DS}=15V, f=1MHz$
C_{iss}	-	539	-		
C_{oss}	-	75	-		
C_{rSS}	-	63	-		
Source-Drain Diode					
I_S *1	-	-	2.3	A	
I_{SM} *2	-	-	9.2		
V_{SD} *1	-	0.8	1.2	V	$I_S=2.3A, V_{GS}=0V$
t_{rr} *1	-	8	-	ns	$I_F=2.3A, V_{GS}=0V, dI_F/dt=100A/\mu s$
Q_{rr} *1	-	3.4	-	nC	

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

*2.Pulse width limited by maximum junction temperature.

P-CH 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
V _{GS(th)}	-1.7	-	-2.7		V _{DS} =V _{GS} , I _D =-250μA
G _{FS} *1	-	12	-	S	V _{DS} =-5V, I _D =-7A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-24V, V _{GS} =0V
	-	-	-25		V _{DS} =-20V, V _{GS} =0V, T _j =125°C
R _{DS(ON)} *1	-	26	36	mΩ	V _{GS} =-10V, I _D =-7A
	-	42	60		V _{GS} =-4.5V, I _D =-5A
Dynamic					
Q _g (V _{GS} =-10V)*1	-	20.4	-	nC	I _D =-7A, V _{DS} =-15V, V _{GS} =-10V
Q _g (V _{GS} =-4.5V)*1	-	10.2	-		
Q _{gs} *1	-	4	-		
Q _{gd} *1	-	4.4	-	ns	V _{DS} =-15V, I _D =-7A, V _{GS} =-10V, R _G =1Ω
t _{d(ON)} *1	-	8.2	-		
t _r *1	-	19.8	-		
t _{d(OFF)} *1	-	62.8	-		
t _f *1	-	25.8	-	pF	V _{GS} =0V, V _{DS} =-15V, f=1MHz
C _{iss}	-	1039	-		
C _{oss}	-	109	-		
C _{rss}	-	97	-		
Source-Drain Diode					
I _S *1	-	-	-2.3	A	
I _{SM} *2	-	-	-9.2		
V _{SD} *1	-	-0.81	-1.2	V	I _S =-2.3A, V _{GS} =0V
t _{rr} *1	-	10.6	-	ns	I _F =-2.3A, V _{GS} =0V, dI _F /dt=100A/μs
Q _{rr} *1	-	5.3	-	nC	

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

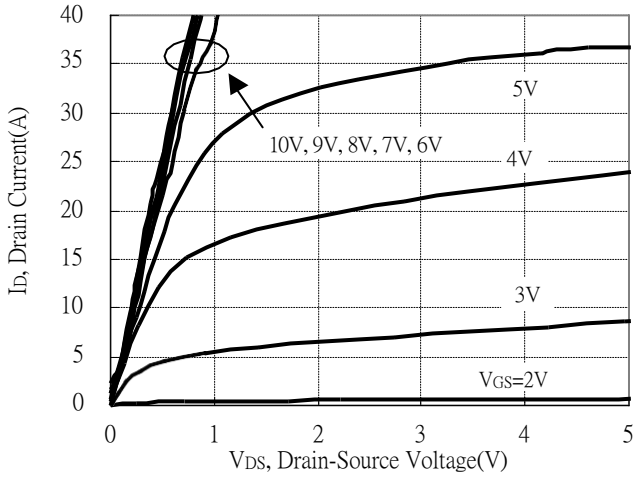
*2.Pulse width limited by maximum junction temperature.

Ordering Information

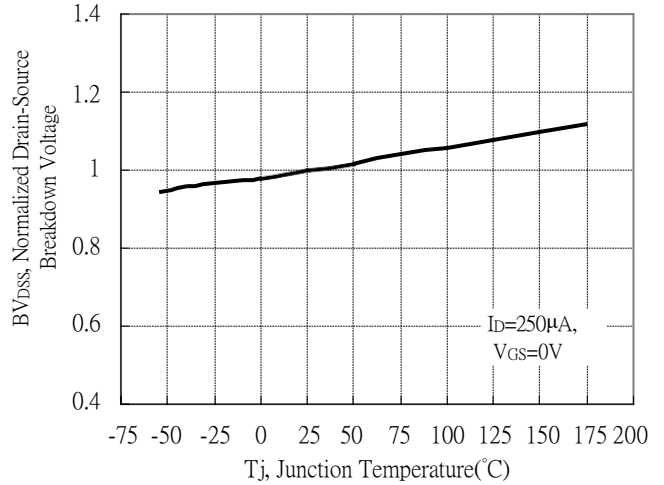
Device	Package	Shipping
KJD20C03	TO-252 (RoHS compliant & Halogen-free package)	3000 pcs / Tape & Reel

Q1, N-CH Typical Characteristics

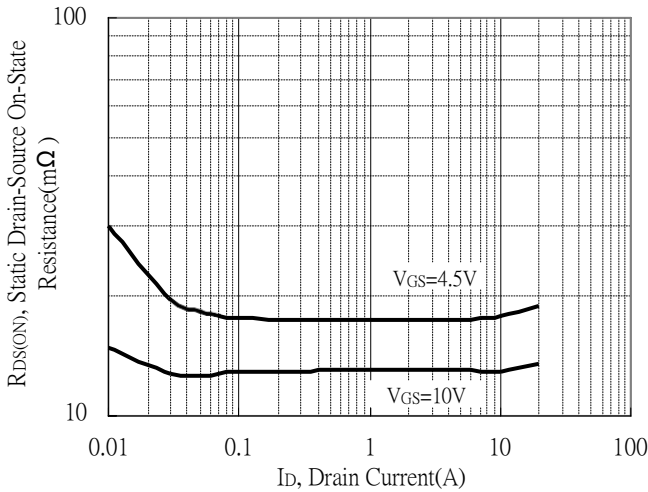
Typical Output Characteristics



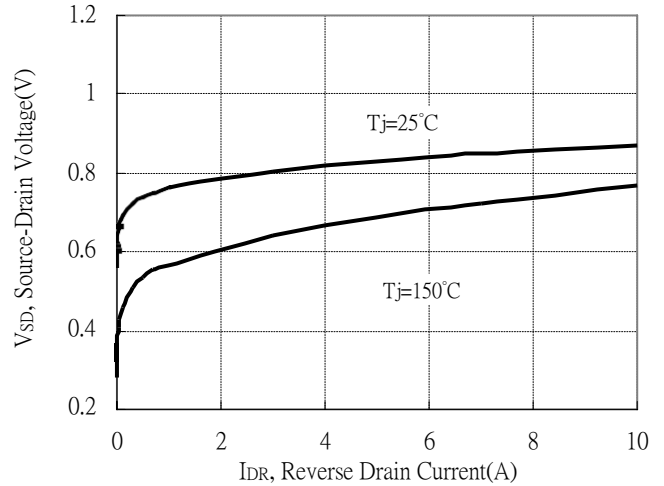
Brekdown Voltage vs Ambient Temperature



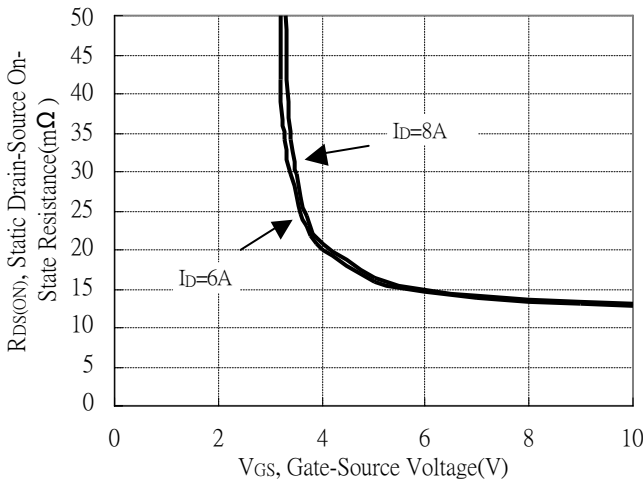
Static Drain-Source On-State resistance vs Drain Current



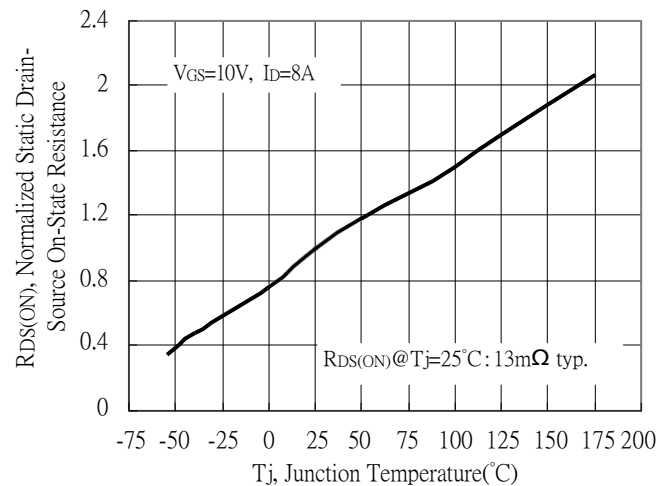
Reverse Drain Current vs Source-Drain Voltage



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

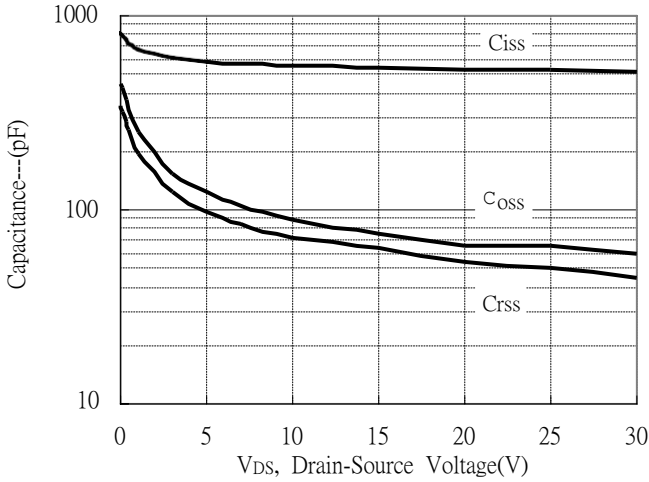


Drain-Source On-State Resistance vs Junction Temperature

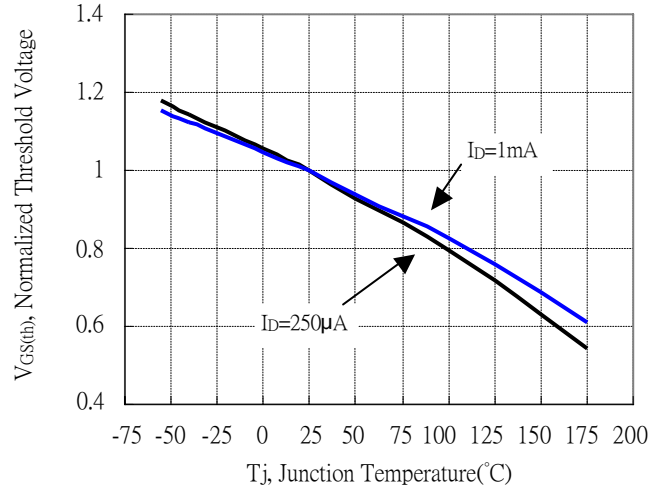


Q1, N-CH Typical Characteristics(Cont.)

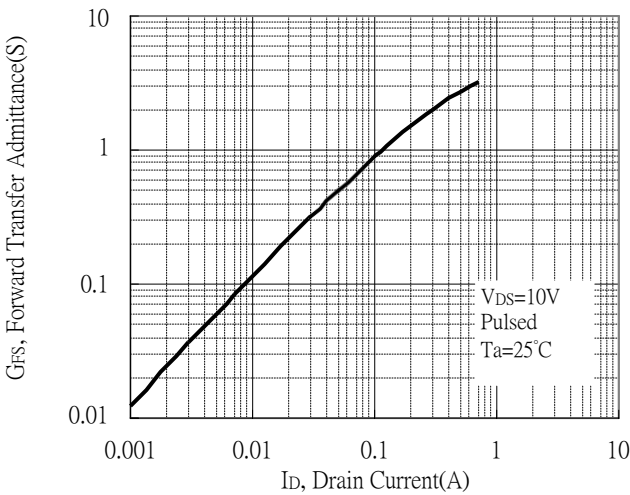
Capacitance vs Drain-to-Source Voltage



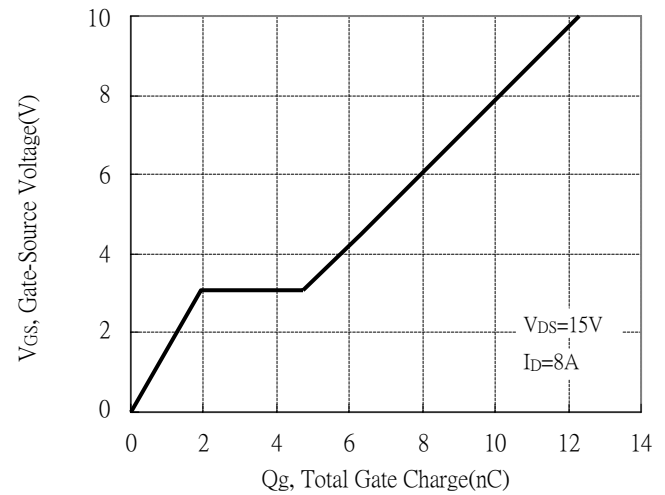
Threshold Voltage vs Junction Temperature



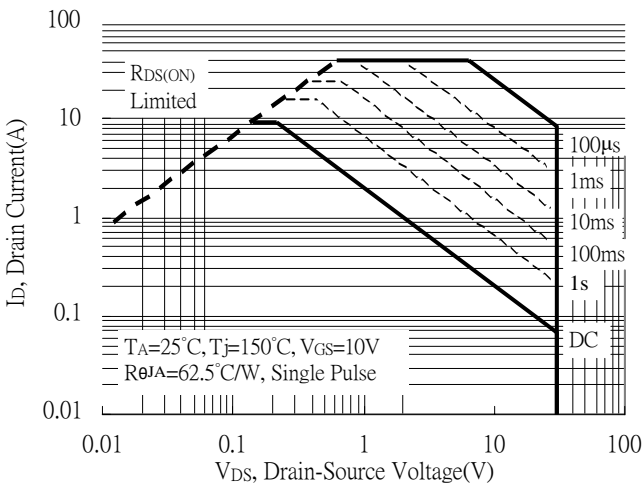
Forward Transfer Admittance vs Drain Current



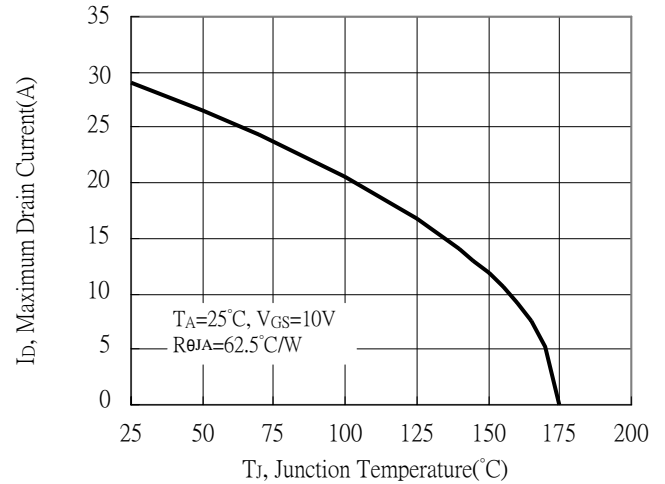
Gate Charge Characteristics



Maximum Safe Operating Area

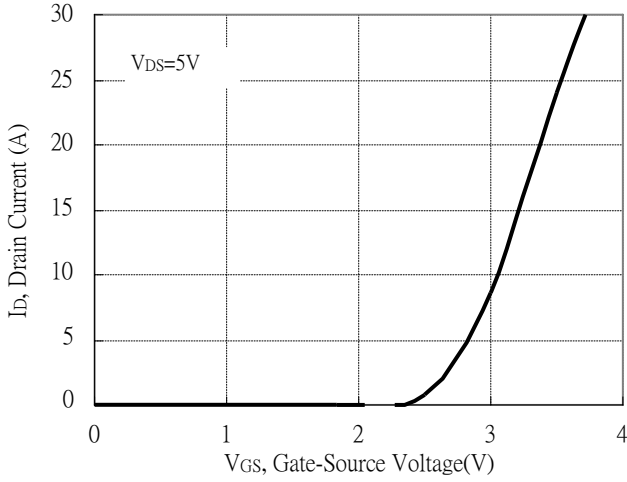


Maximum Drain Current vs Junction Temperature

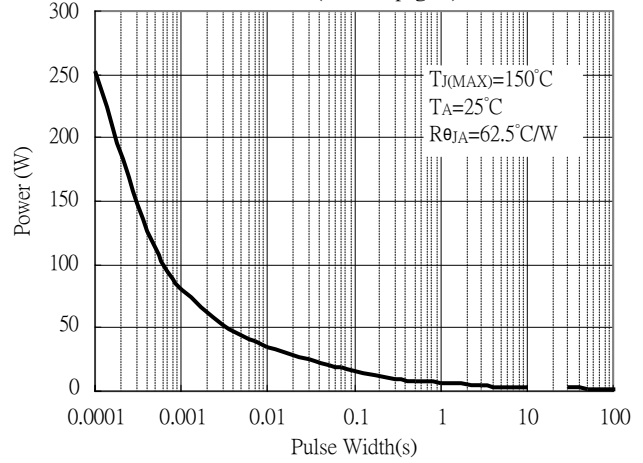


Q1, N-CH Typical Characteristics(Cont.)

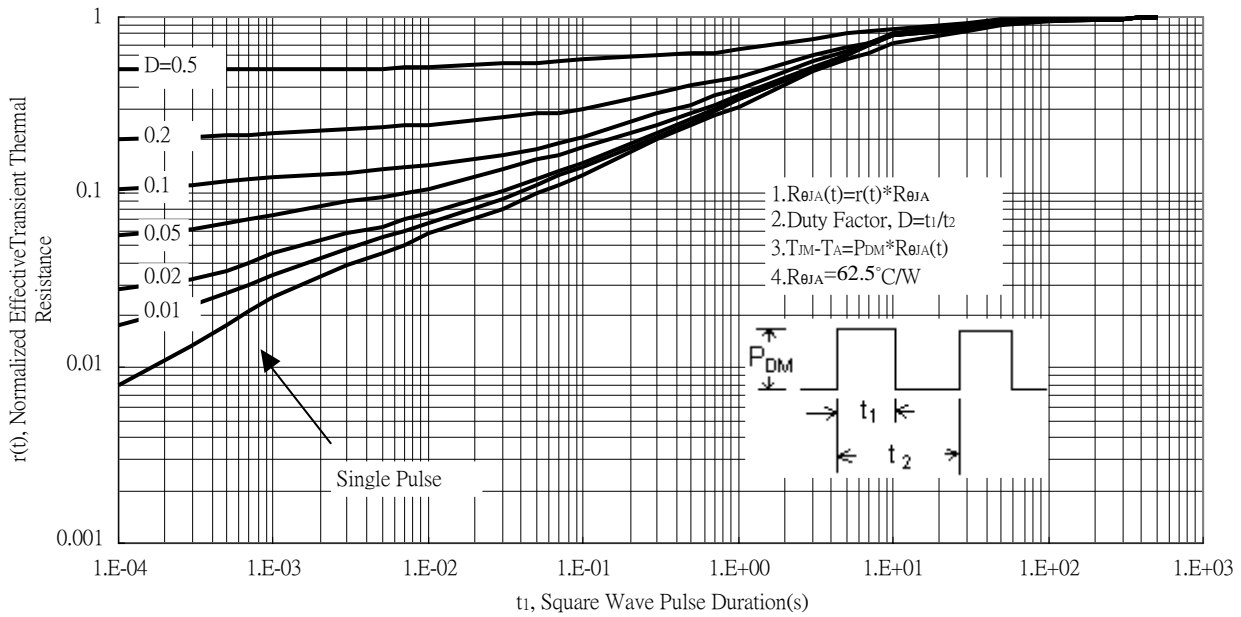
Typical Transfer Characteristics



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

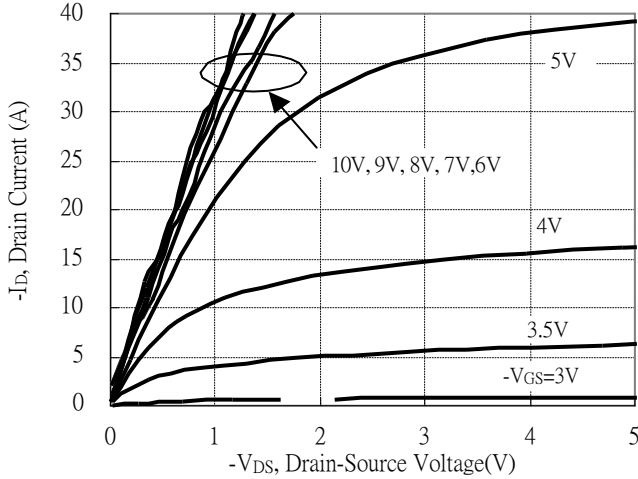


Transient Thermal Response Curves

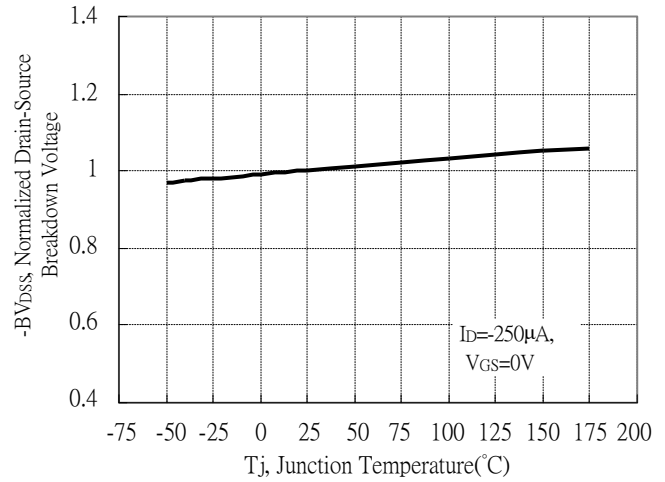


Q2, P-CH Typical Characteristics

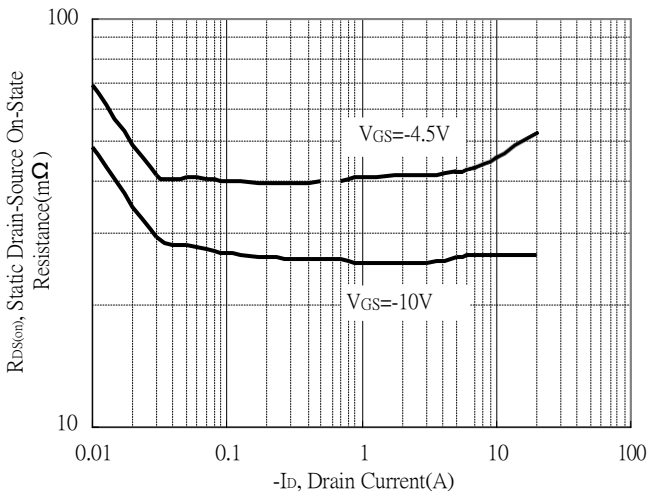
Typical Output Characteristics



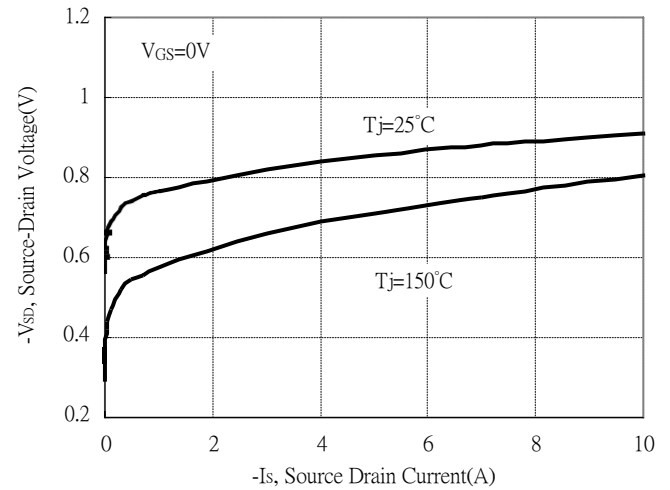
Brekdown Voltage vs Ambient Temperature



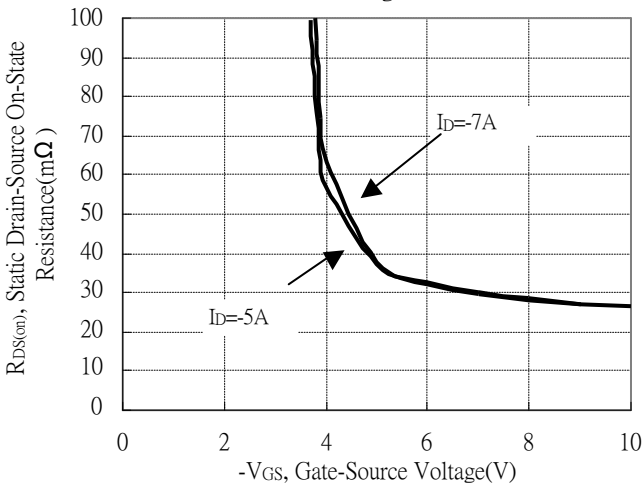
Static Drain-Source On-State resistance vs Drain Current



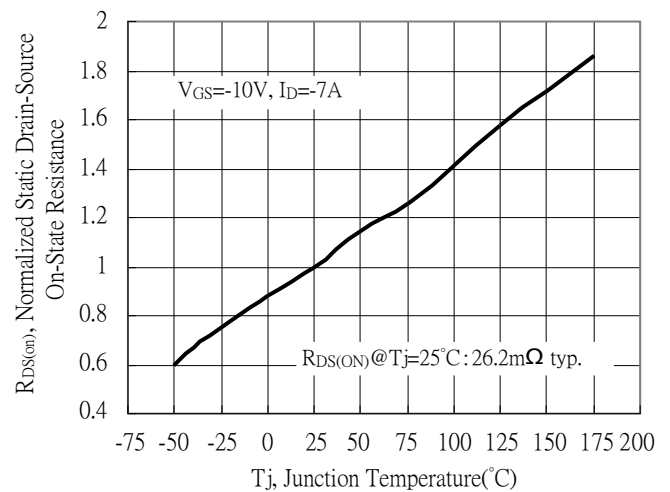
Source Drain Current vs Source-Drain Voltage



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

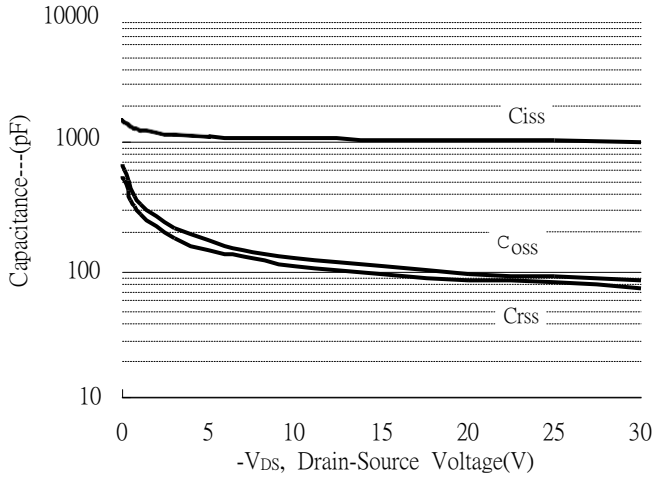


Drain-Source On-State Resistance vs Junction Temperature

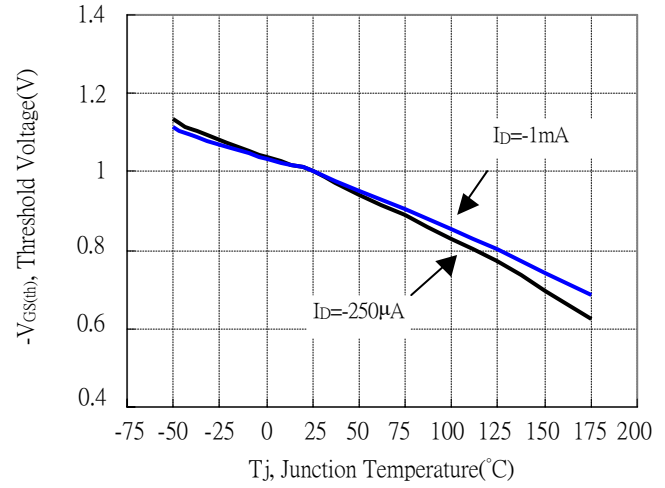


Q2, P-CH Typical Characteristics(Cont.)

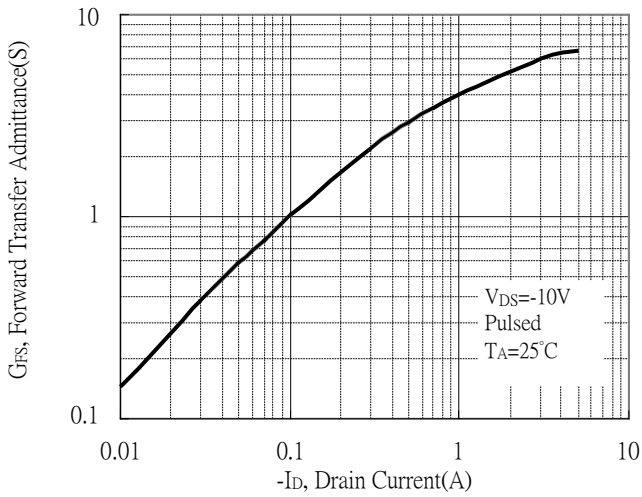
Capacitance vs Drain-to-Source Voltage



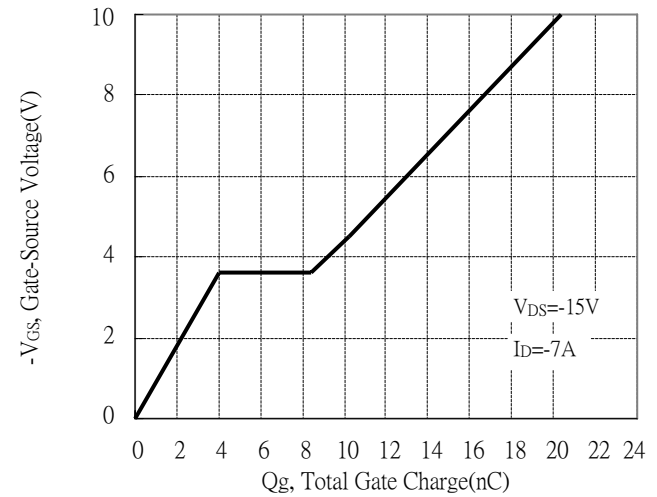
Threshold Voltage vs Junction Temperature



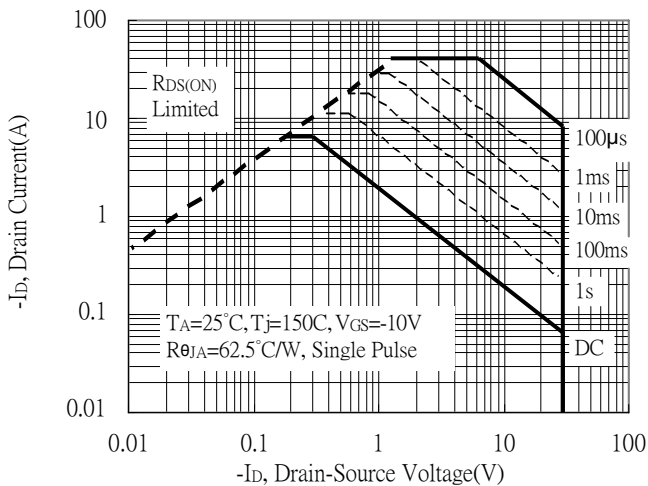
Forward Transfer Admittance vs Drain Current



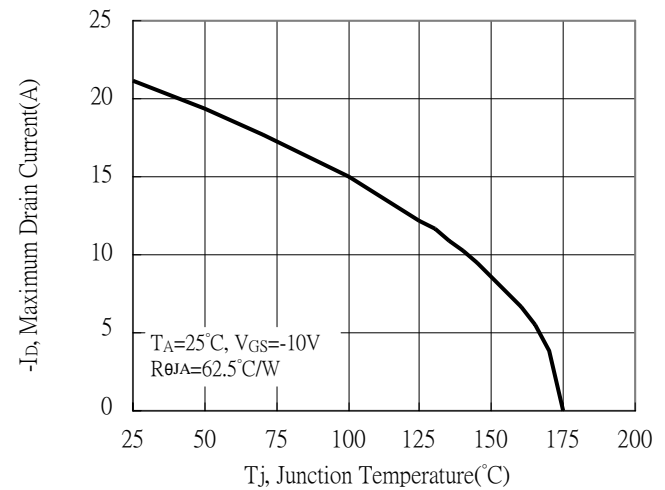
Gate Charge Characteristics



Maximum Safe Operating Area

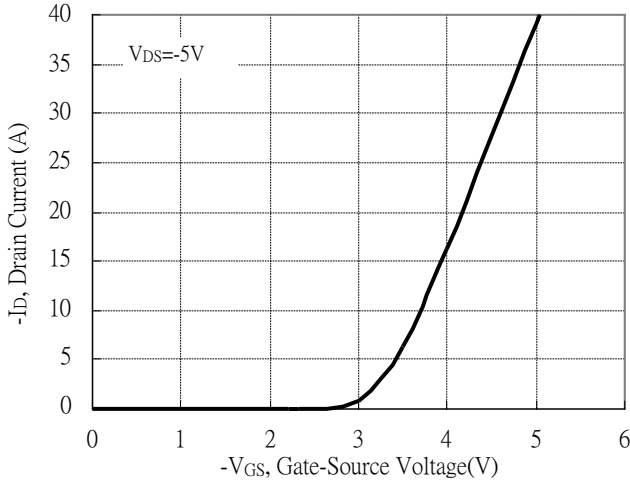


Maximum Drain Current vs Junction Temperature

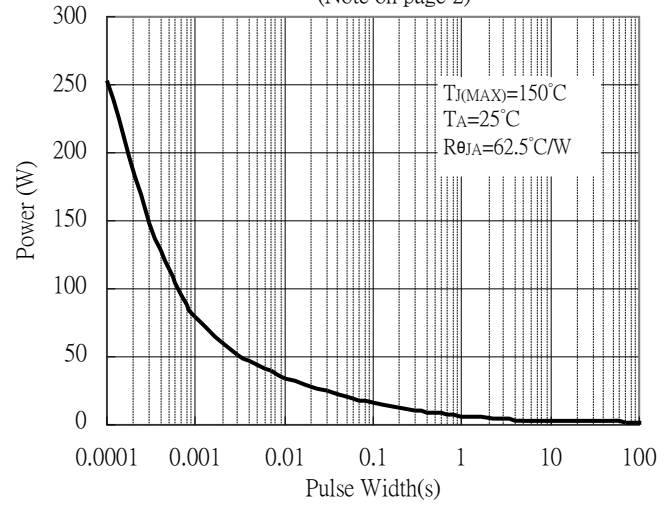


Q2, P-CH Typical Characteristics(Cont.)

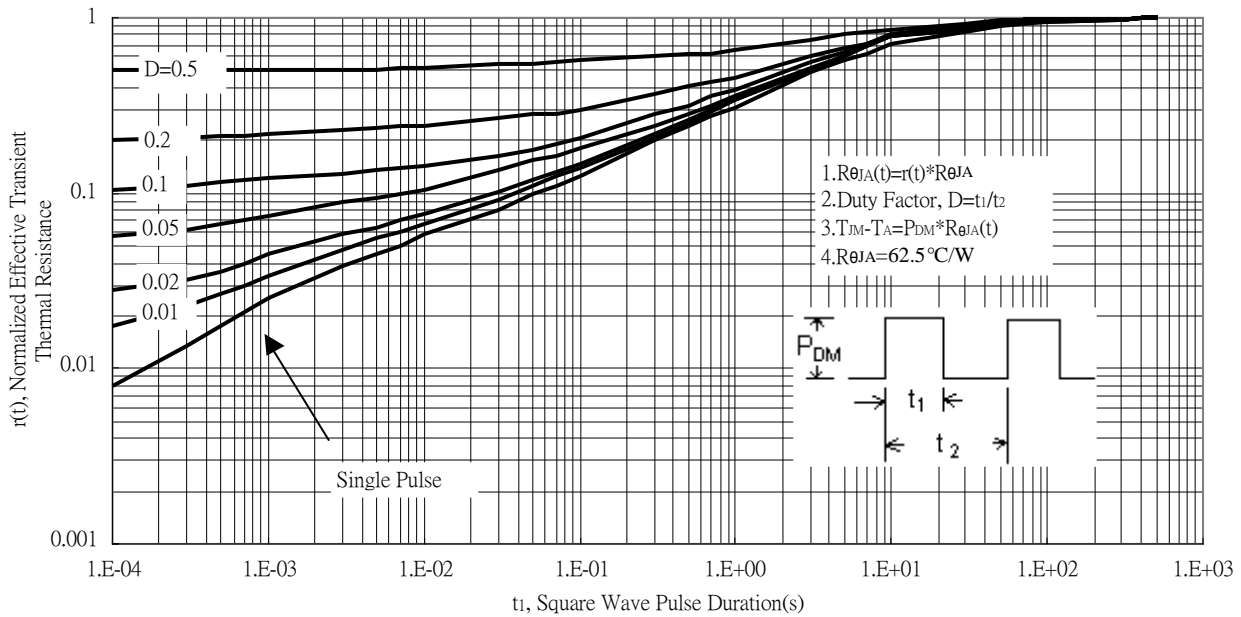
Typical Transfer Characteristics



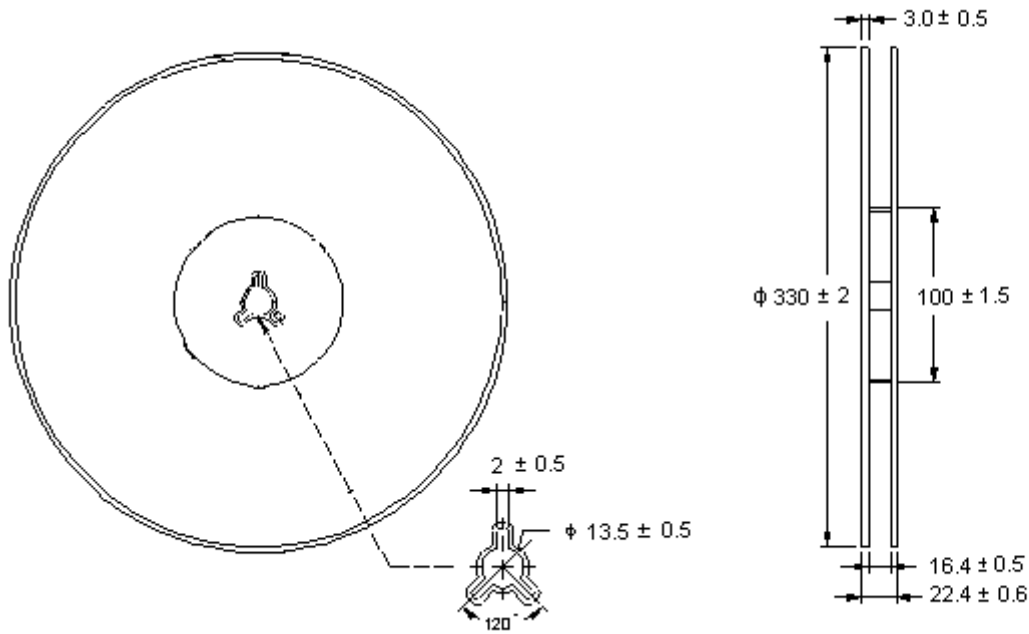
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



Transient Thermal Response Curves

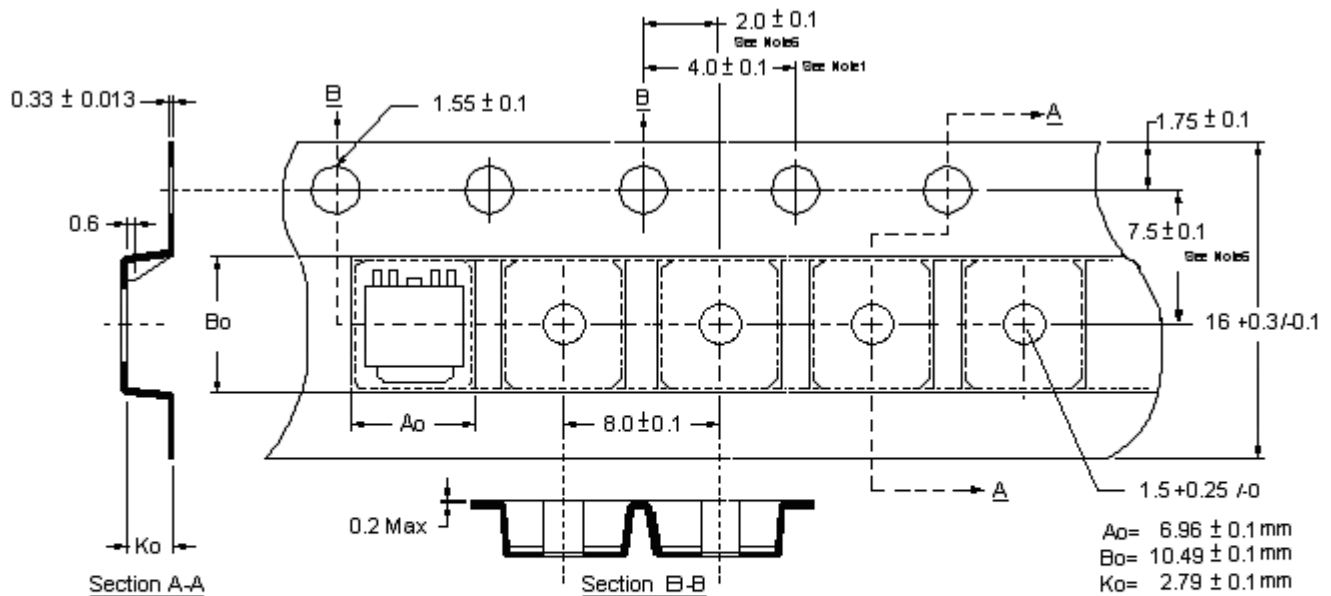


Reel Dimension



Unit: millimeter

Carrier Tape Dimension

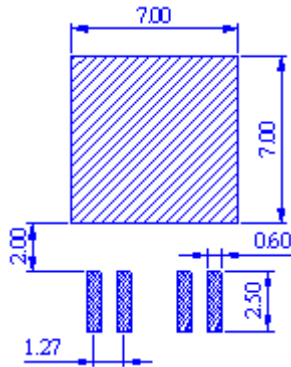


Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material : Conductive black polystyrene.
4. A_0 & B_0 measured on a plane 0.3mm above the bottom of the pocket.
5. K_0 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.

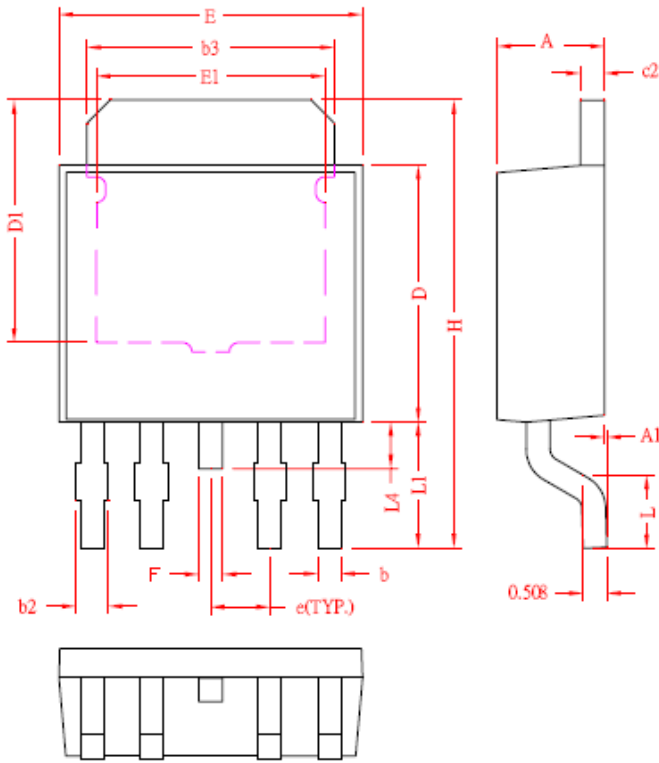
unit : millimeter

Recommended soldering footprint

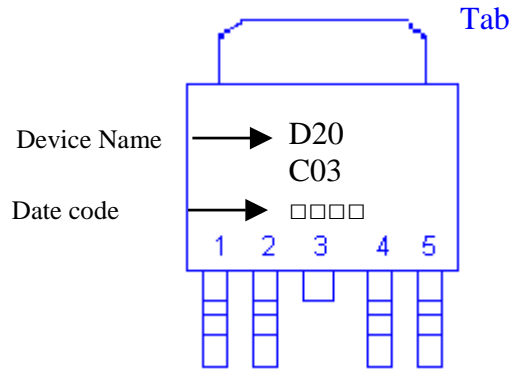


Unit : mm

TO-252 Dimension (S forming)



Marking:

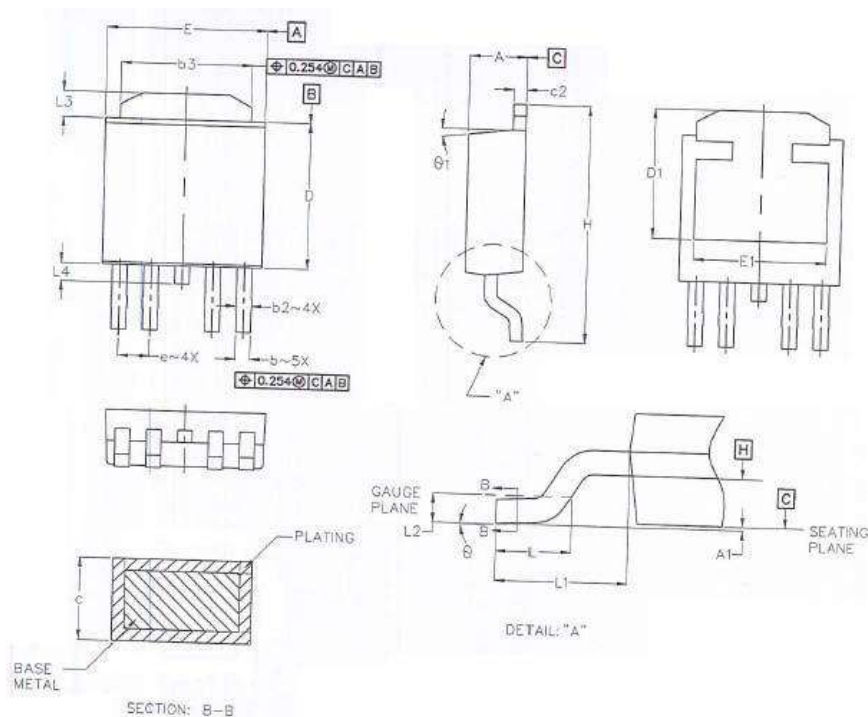


Style: Pin 1. Source 1 2. Gate 1 3. & Tab
 Drain 1 & Drain 2 4. Source 2 5. Gate 2

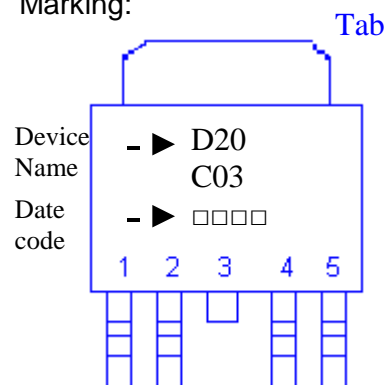
4-Lead TO-252 Plastic Surface Mount Package

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0866	0.0945	2.20	2.40	E	0.2520	0.2677	6.40	6.80
A1	0.0000	0.0059	0.00	0.15	E1	0.1500	-	3.81	-
b	0.0157	0.0236	0.40	0.60	e	0.0500	REF	1.27	REF
b2	0.0199	0.0315	0.50	0.80	F	0.0157	0.0236	0.40	0.60
b3	0.2047	0.2165	5.20	5.50	H	0.3701	0.4016	9.40	10.20
c2	0.0177	0.0217	0.45	0.55	L	0.0551	0.0697	1.40	1.77
D	0.2126	0.2283	5.40	5.80	L1	0.0945	0.1181	2.40	3.00
D1	0.1799	-	4.57	-	L4	0.0315	0.0472	0.80	1.20

TO-252 Dimension (T forming)



Marking:



4-Lead TO-252 Plastic Surface Mount Package

Style: Pin 1.Soure 1 2.Gate 1 3.&Tab
 Drain 1& Drain 2 4. Source 2 5. Gate 2

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0858	0.0941	2.18	2.39	E1	0.1697	-	4.31	-
A1	0.0000	0.0051	0.00	0.13	e	0.0500	BSC	1.27	BSC
b	0.0197	0.0283	0.50	0.72	H	0.3697	0.4102	9.39	10.42
b2	0.0240	0.0311	0.61	0.79	L	0.0547	0.0701	1.39	1.78
b3	0.1949	0.2154	4.95	5.47	L1	0.1079	BSC	2.74	BSC
c	0.0181	0.0240	0.46	0.61	L2	0.0197	BSC	0.50	BSC
c2	0.0181	0.0350	0.46	0.89	L3	0.0346	0.0500	0.88	1.27
D	0.2346	0.2453	5.96	6.23	L4	-	0.0402	-	1.02
D1	0.2047	-	5.20	-	θ	0°	10°	0°	10°
E	0.2500	0.2654	6.35	6.74	θ1	0°	10°	0°	10°