Dual N-Channel Enhancement Mode MOSFET

MTS2072G6

	Tr1(N-CH)	Tr2(N-CH)
BV_{DSS}	60V	30V
I_D	0.53A(V_{GS}=10V)	5.6A(V_{GS}=10 V)
$R_{DSON(TYP.)}$	1.2Ω(V_{GS}=10V)	16.6mΩ(V_{GS}=10V)
	1.6Ω(V_{GS}=4.5V)	24.7mΩ(V_{GS}=4.5V)

Description

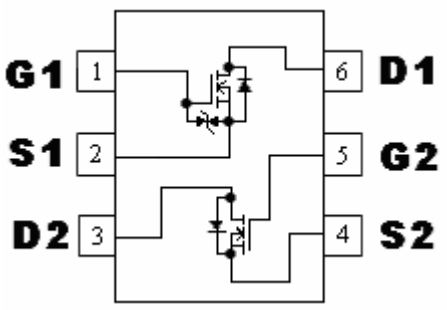
The MTS2072G6 consists of two different N-channel enhancement-mode MOSFETs in a single TSOP-6 package, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.
The TSOP-6 package is universally preferred for all commercial-industrial surface mount applications.

Features

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

Equivalent Circuit

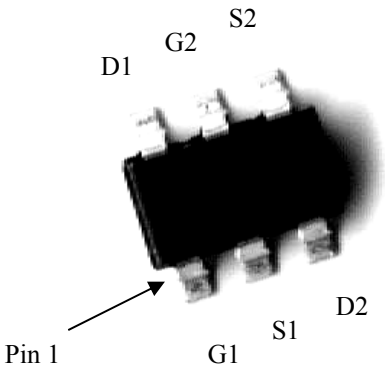
MTS2072G6



G：Gate
S：Source
D：Drain

Outline

TSOP-6



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		N-channel	N-channel	
Drain-Source Breakdown Voltage	BV_{DSS}	60	30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current @T_A=25 °C, V_{GS}=10V (Note 1)	I_D	0.53	5.6	A
Continuous Drain Current @T_A=70 °C, V_{GS}=10V (Note 1)	I_D	0.42	4.5	A
Pulsed Drain Current (Note 2)	I_{DM}	1	20	A
Total Power Dissipation (Note 1)	Pd	1.14		W
Linear Derating Factor		0.01		W / °C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150		°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	110		°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec; 180°C/W when mounted on minimum copper pad.
2.Pulse width limited by maximum junction temperature.

Tr 1, N-Channel Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	0.9	1.5	2.4		V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1		V_{DS}=60V, V_{GS}=0
	-	-	10		V_{DS}=48V, V_{GS}=0, Tj=70°C
*$R_{DS(ON)}$	-	1.2	2.5	Ω	I_D=500mA, V_{GS}=10V
	-	1.6	3		I_D=100mA, V_{GS}=4.5V
*G_{FS}	100	215	-	mS	V_{DS}=10V, I_D=100mA
Dynamic					
Ciss	-	31	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
Coss	-	6	-		
Crss	-	4.1	-		
*$t_{d(ON)}$	-	2.5	-	ns	V_{DS}=30V, I_D=100mA, V_{GS}=10V, R_G=25Ω
*t_r	-	6.3	-		
*$t_{d(OFF)}$	-	6	-		
*t_f	-	4.4	-		
*Qg	-	0.9	-	nC	V_{DS}=30V, I_D=0.53A, V_{GS}=10V
*Qgs	-	0.1	-		
*Qgd	-	0.3	-		
Source-Drain Diode					
*I_S	-	-	0.53	A	
*I_{SM}	-	-	1		
*V_{SD}	-	0.8	1.2	V	V_{GS}=0V, I_S=100mA

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

Tr 2, N-Channel Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	1	1.6	2.5	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0
	-	-	25	μA	V_{DS}=24V, V_{GS}=0, Tj=70°C
*$R_{DS(ON)}$	-	16.6	25	mΩ	I_D=5A, V_{GS}=10V
	-	24.7	35		I_D=3A, V_{GS}=4.5V
*G_{FS}	-	6	-	S	V_{DS}=5V, I_D=4A
Dynamic					
Ciss	-	718	-	pF	V_{DS}=15V, V_{GS}=0, f=1MHz
Coss	-	78	-		
Crss	-	69	-		
*$t_{d(ON)}$	-	7.4	-	ns	V_{DS}=15V, I_D=1A, V_{GS}=10V, R_G=6Ω
*t_r	-	19	-		
*$t_{d(OFF)}$	-	35	-		
*t_f	-	13	-		
*Qg	-	10	-	nC	V_{DS}=15V, I_D=5.6A, V_{GS}=10V
*Qgs	-	2.5	-		
*Qgd	-	3.1	-		
Source-Drain Diode					
*I_S	-	-	5	A	
*I_{SM}	-	-	20		
*V_{SD}	-	0.82	1.2	V	V_{GS}=0V, I_S=5A

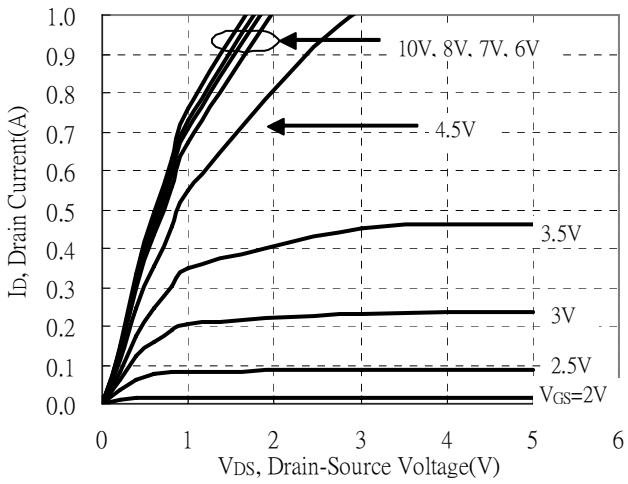
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

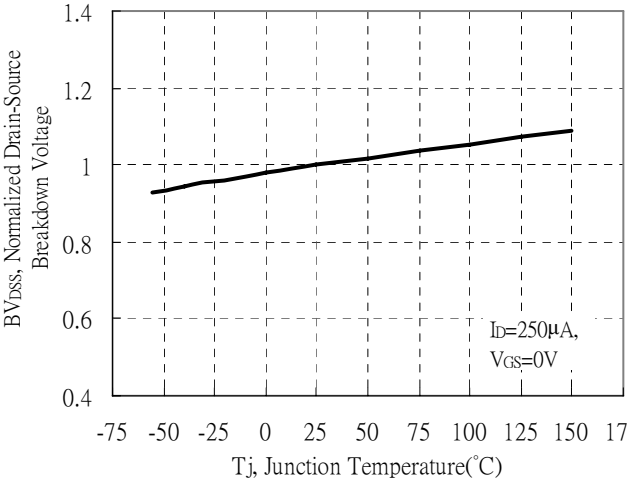
Device	Package	Shipping
MTS2072G6-0-T1-G	TSOP-6 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

N-channel Typical Characteristics, Tr 1

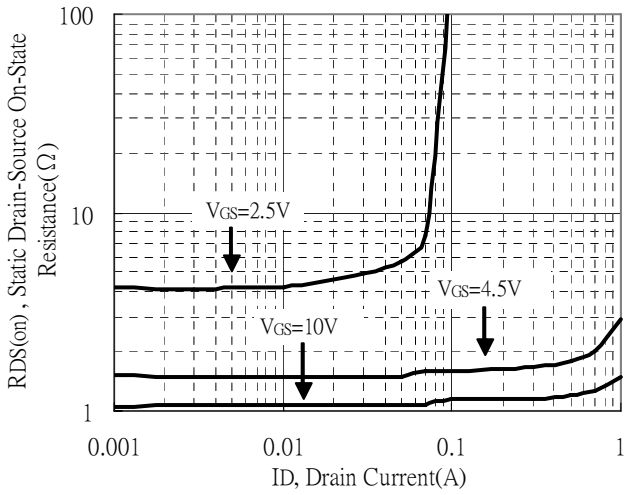
Typical Output Characteristics



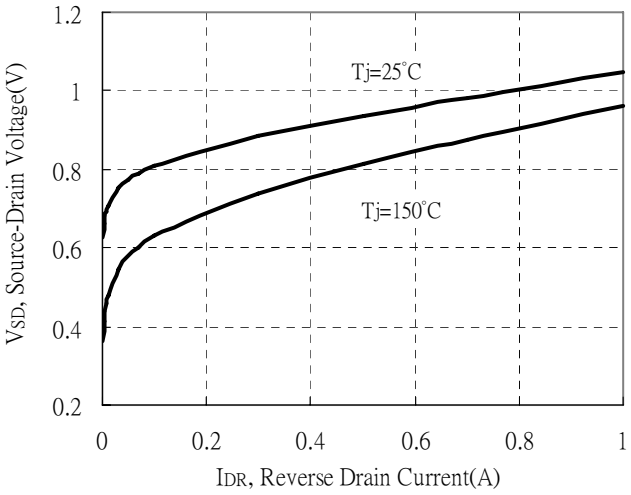
Brekdown Voltage vs Ambient Temperature



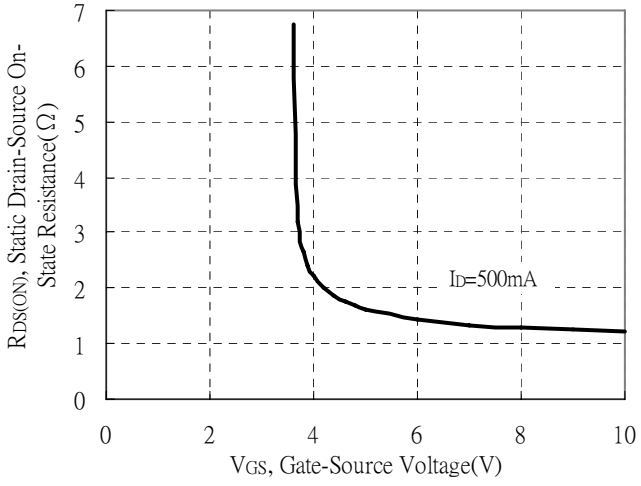
Static Drain-Source On-State resistance vs Drain Current



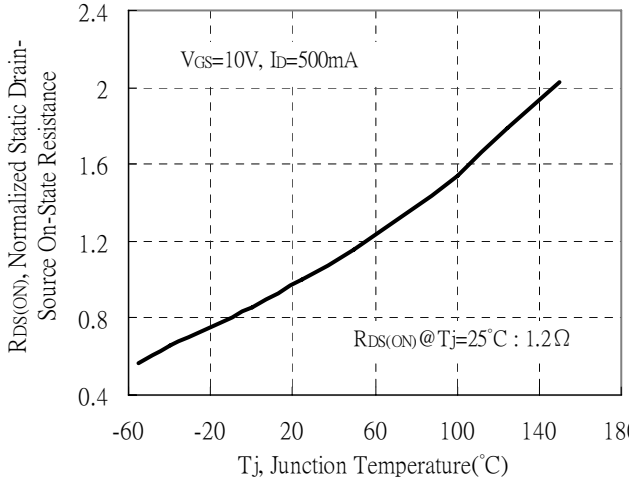
Reverse Drain Current vs Source-Drain Voltage



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

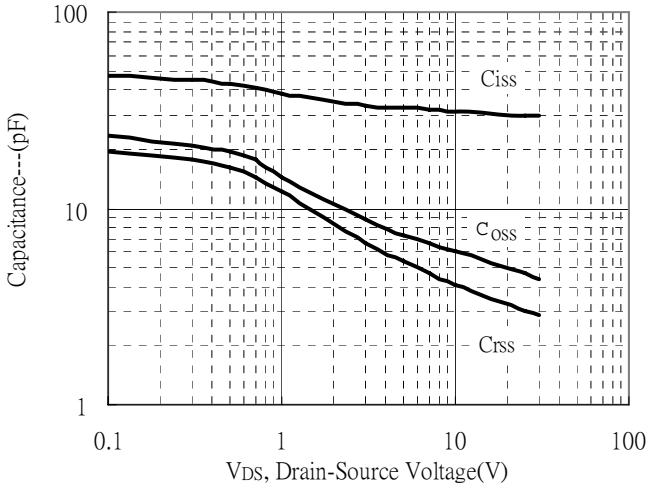


Drain-Source On-State Resistance vs Junction Tempearture

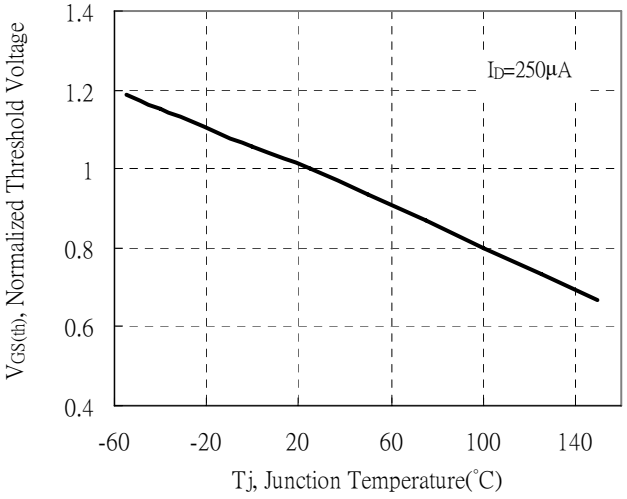


N-channel Typical Characteristics, Tr 1(Cont.)

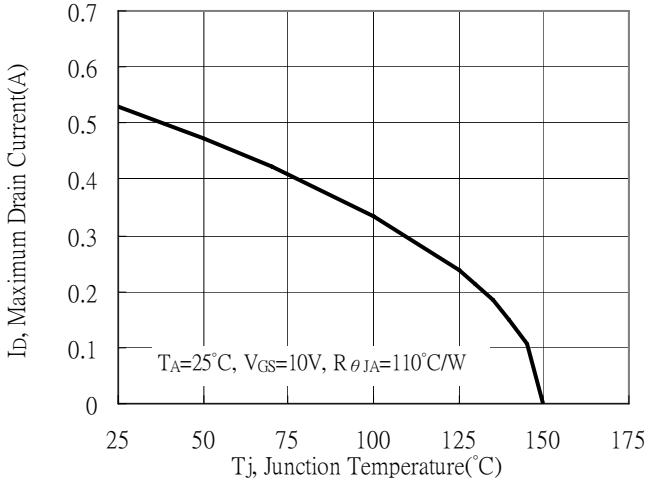
Capacitance vs Drain-to-Source Voltage



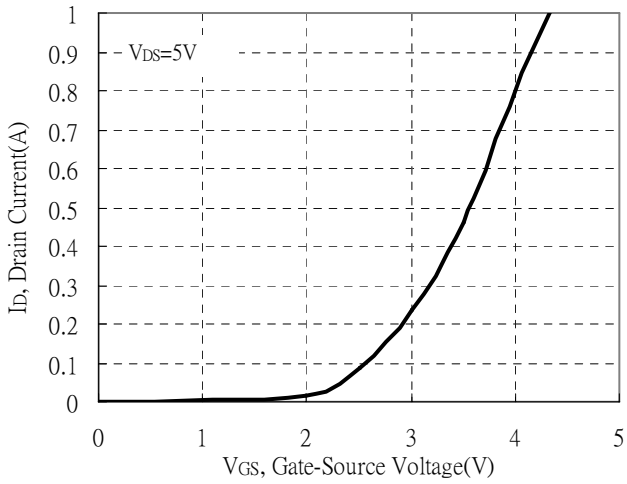
Threshold Voltage vs Junction Tempearture



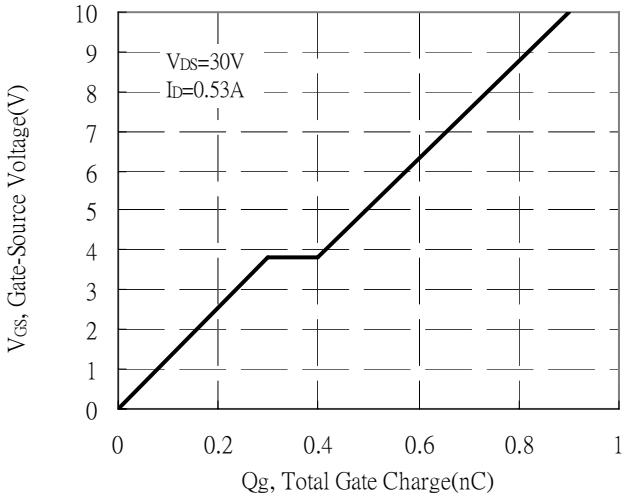
Maximum Drain Current vs JunctionTemperature



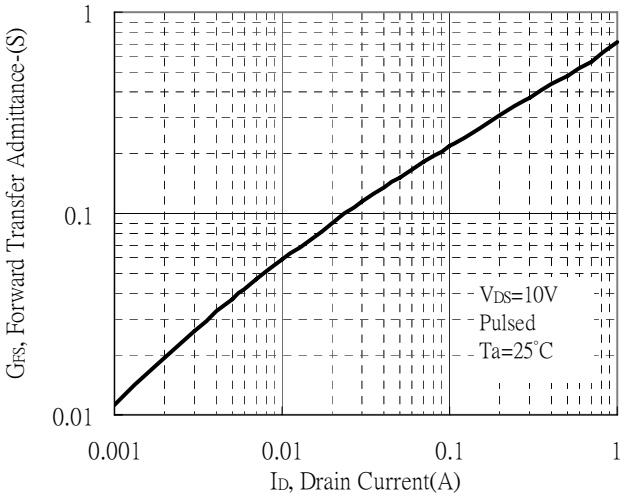
Typical Transfer Characteristics



Gate Charge Characteristics

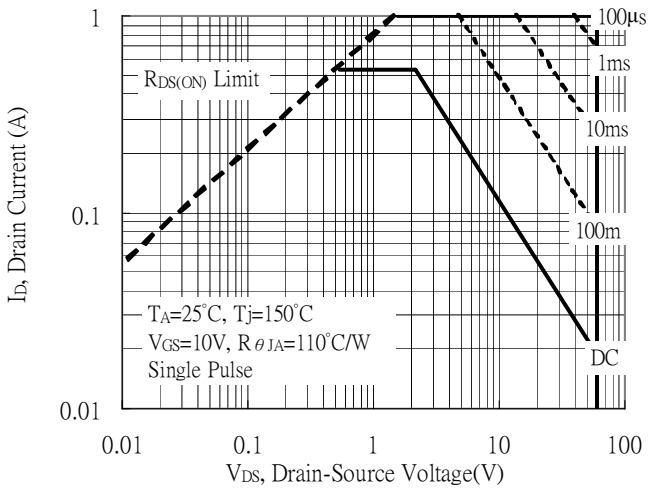


Forward Transfer Admittance vs Drain Current

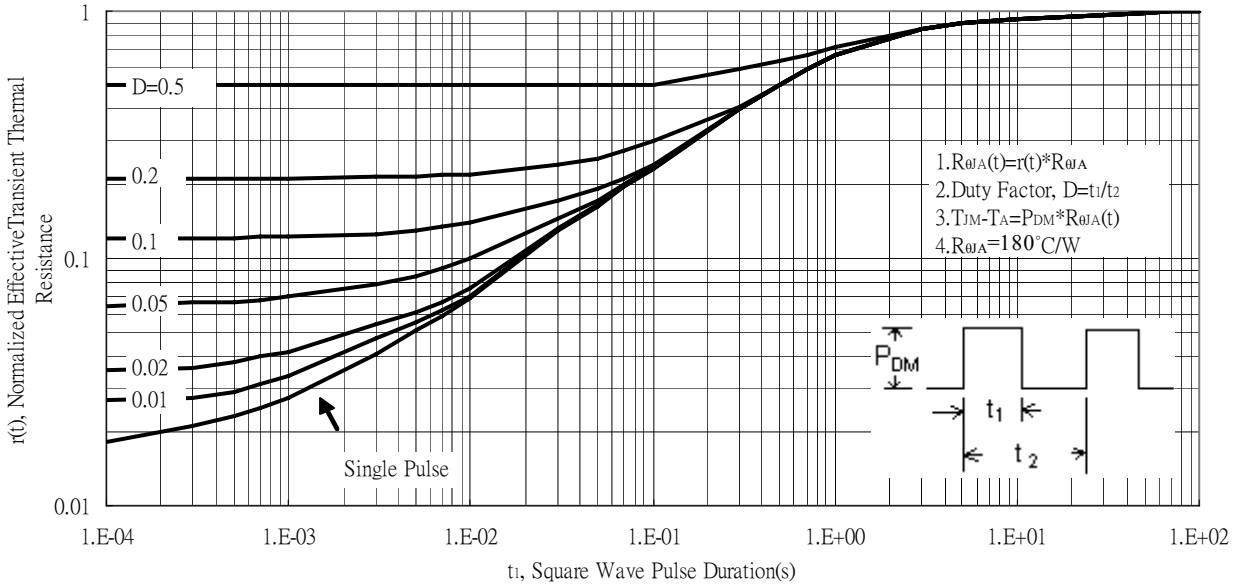


N-channel Typical Characteristics, Tr 1(Cont.)

Maximum Safe Operating Area

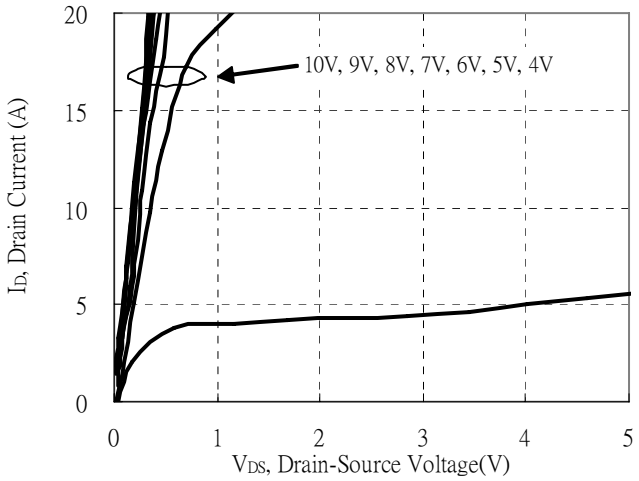


Transient Thermal Response Curves

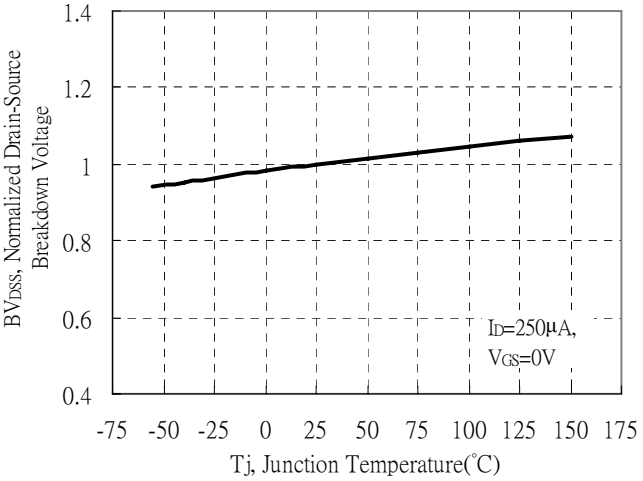


N-channel Typical Characteristics, Tr 2

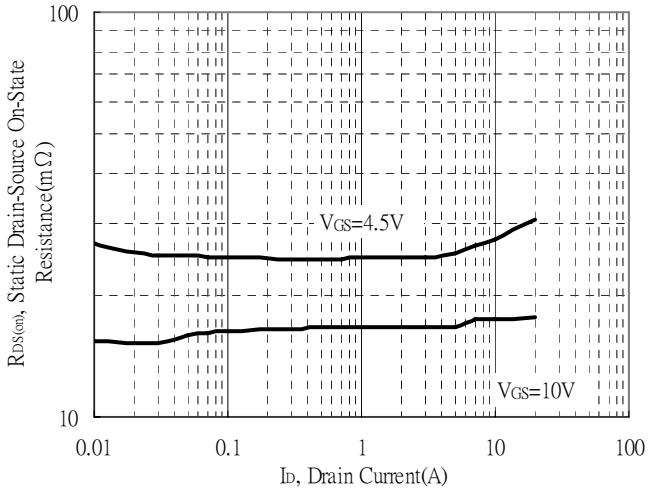
Typical Output Characteristics



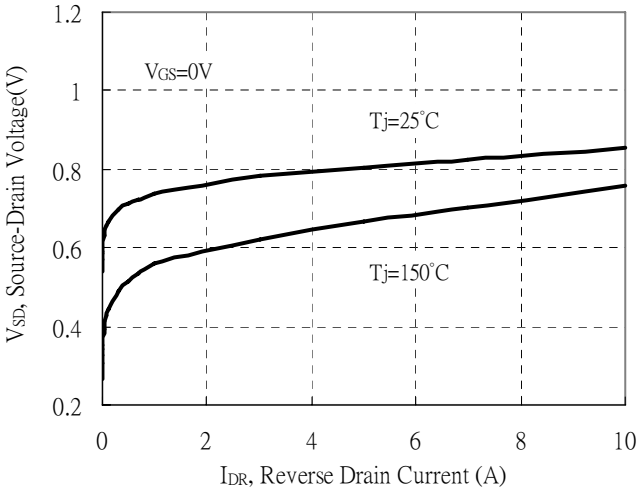
Brekdown Voltage vs Ambient Temperature



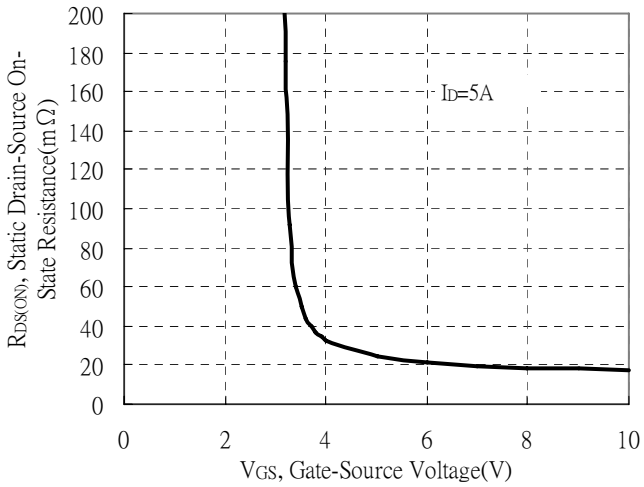
Static Drain-Source On-State resistance vs Drain Current



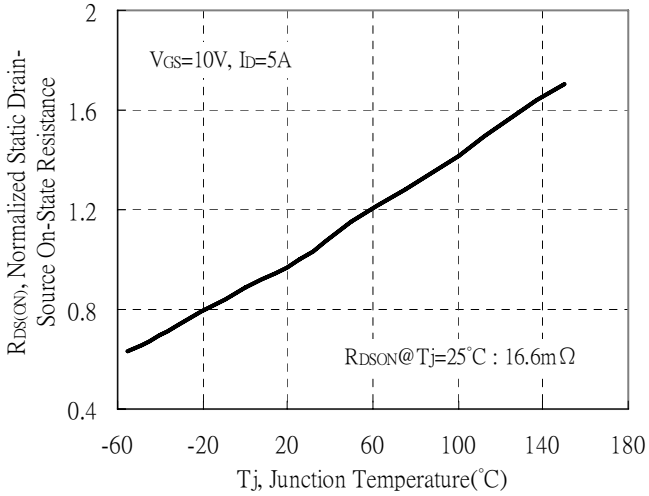
Reverse Drain Current vs Source-Drain Voltage



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

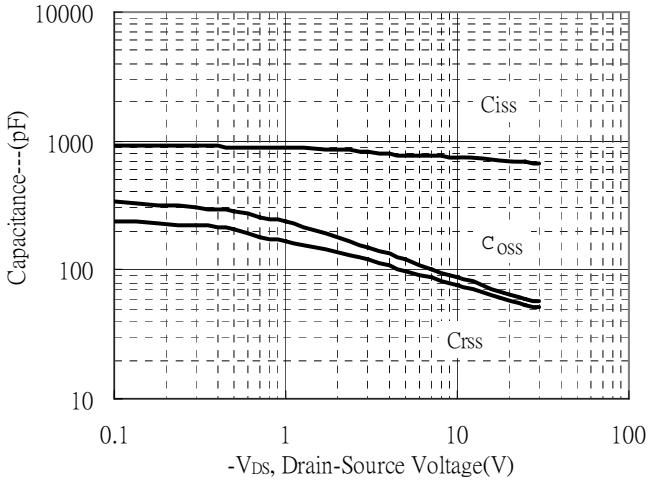


Drain-Source On-State Resistance vs Junction Tempearture

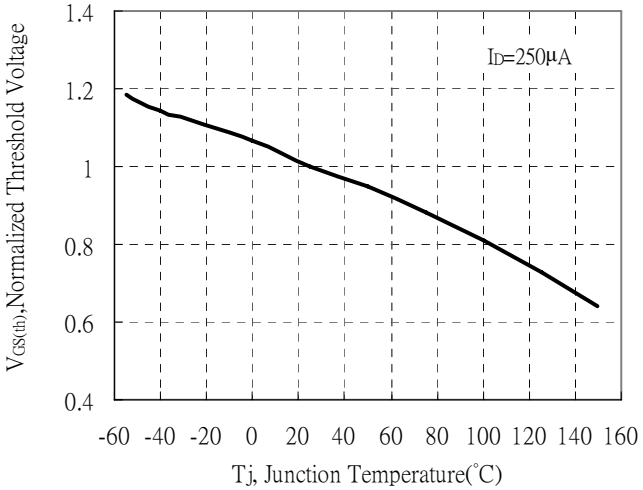


N-channel Typical Characteristics, Tr 2(Cont.)

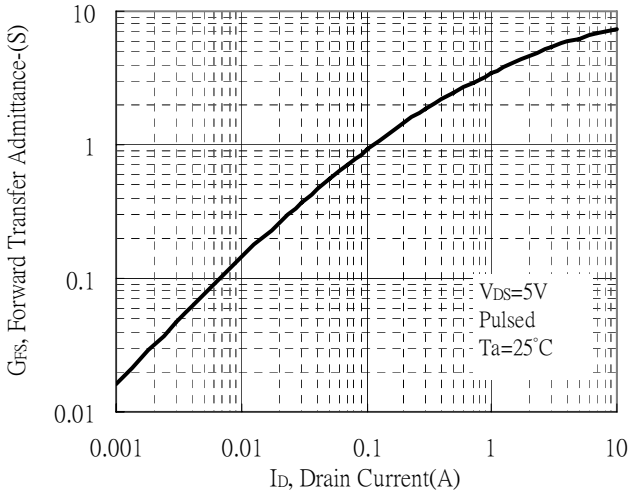
Capacitance vs Drain-to-Source Voltage



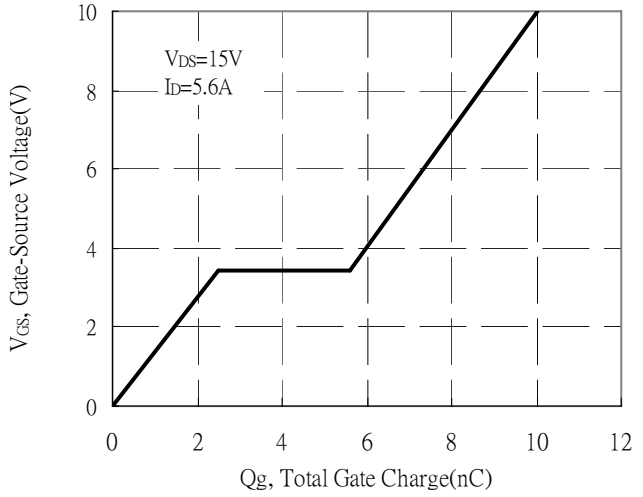
Threshold Voltage vs Junction Tempearture



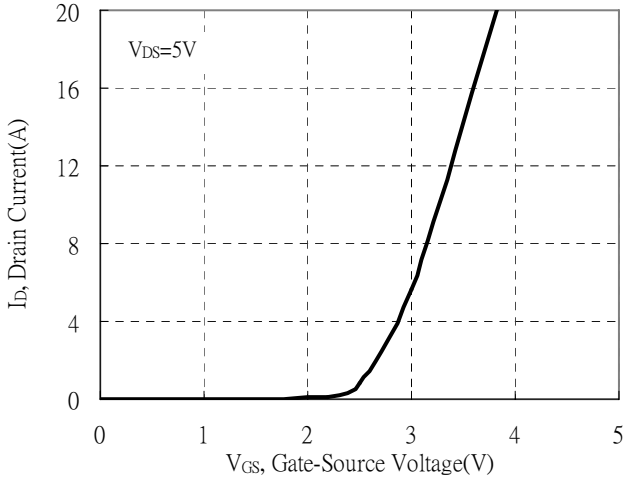
Forward Transfer Admittance vs Drain Current



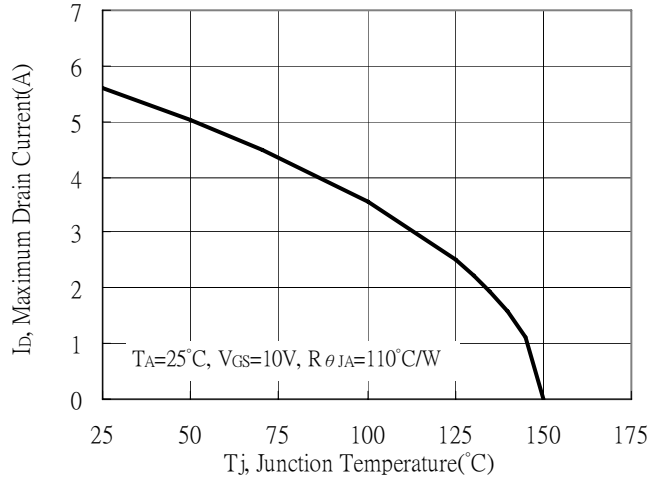
Gate Charge Characteristics



Typical Transfer Characteristics

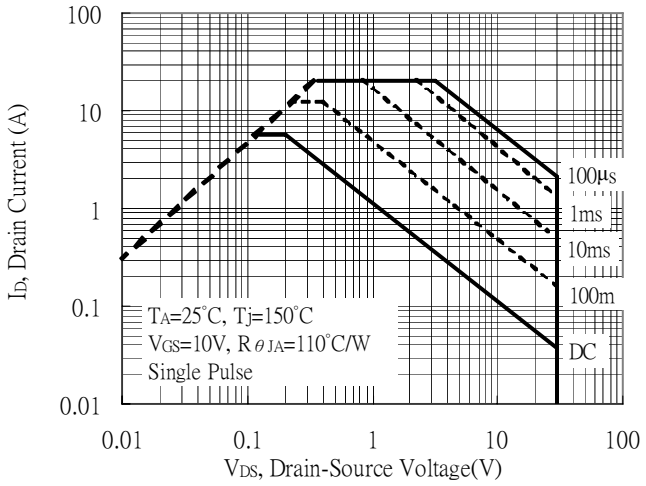


Maximum Drain Current vs JunctionTemperature

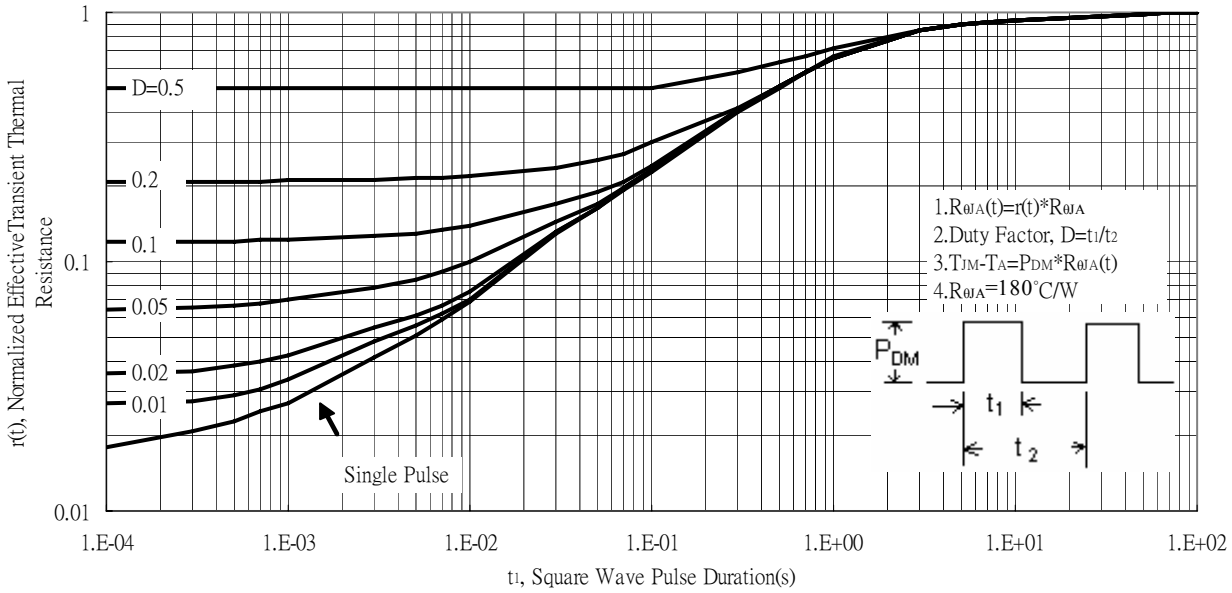


N-channel Typical Characteristics, Tr 2(Cont.)

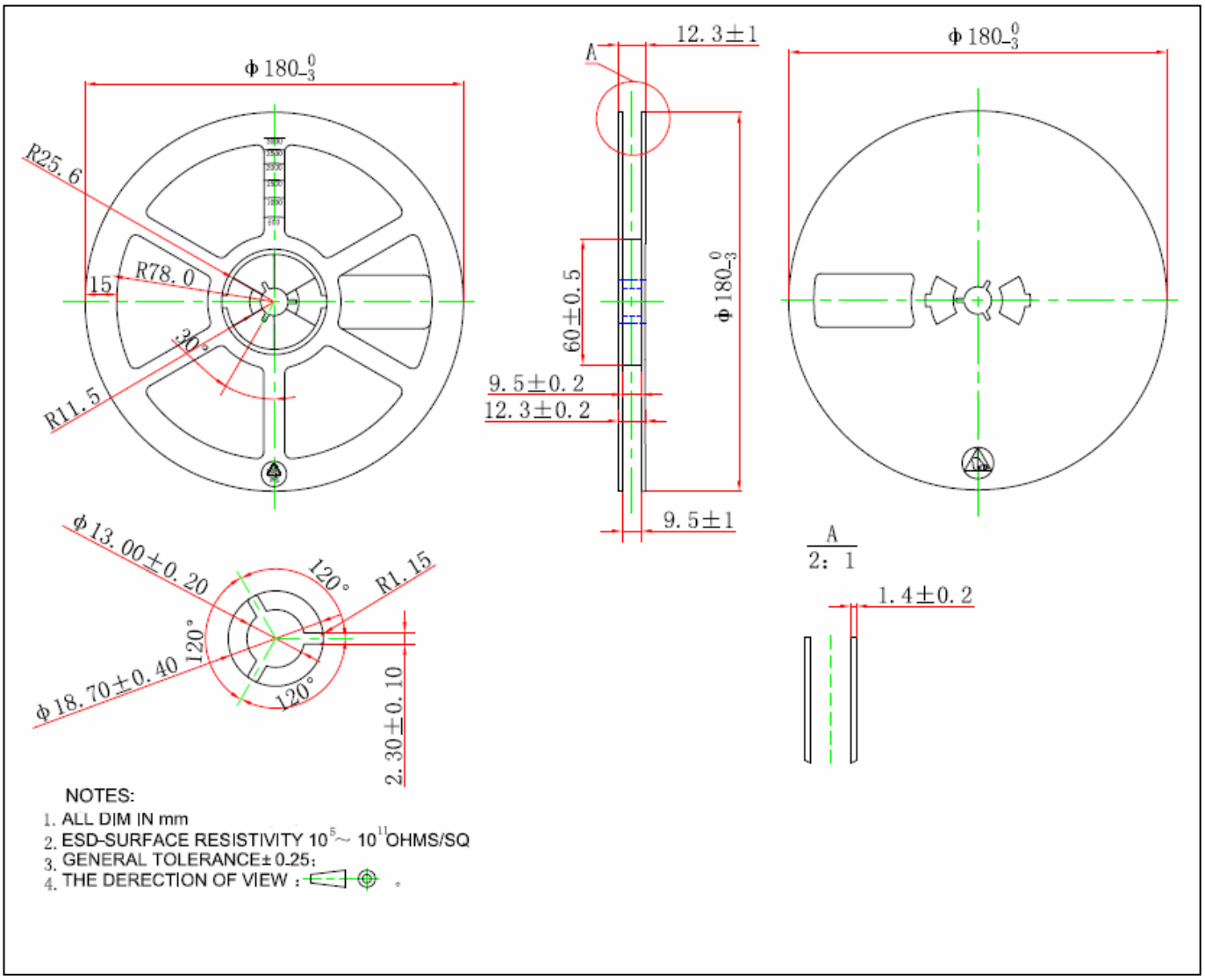
Maximum Safe Operating Area



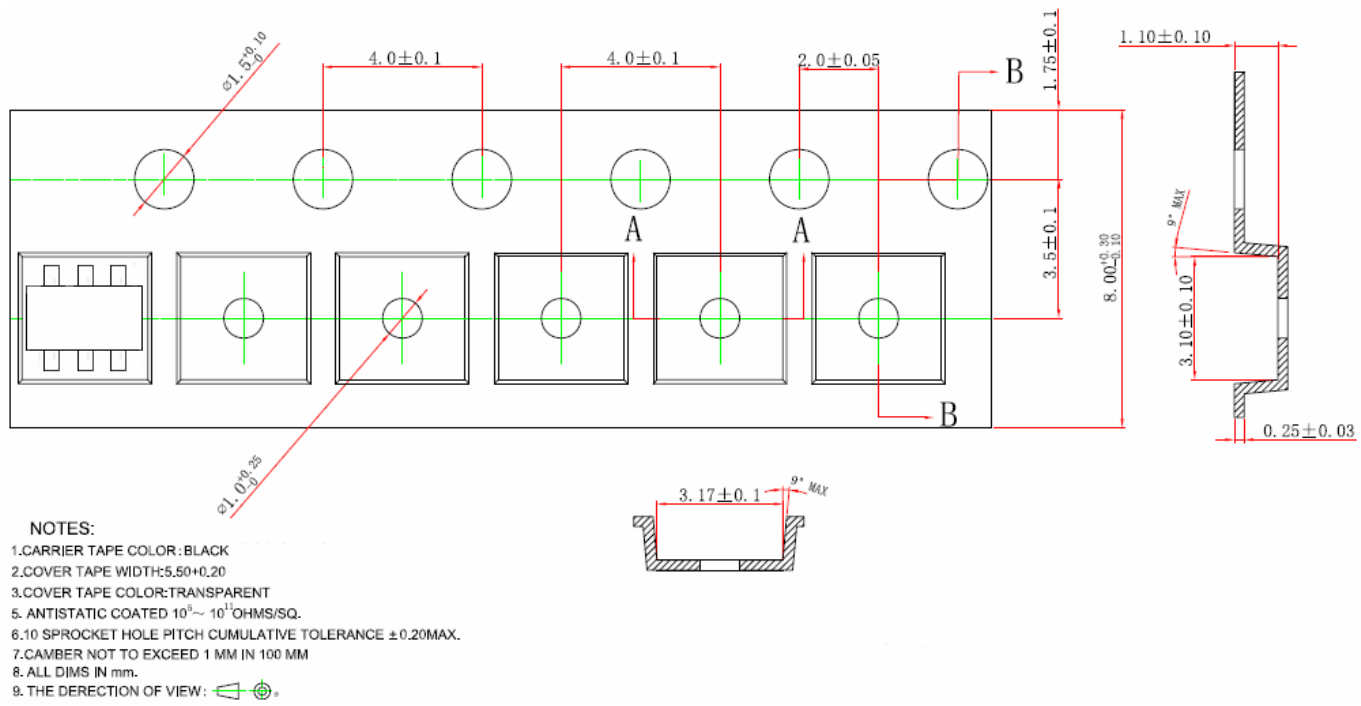
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension

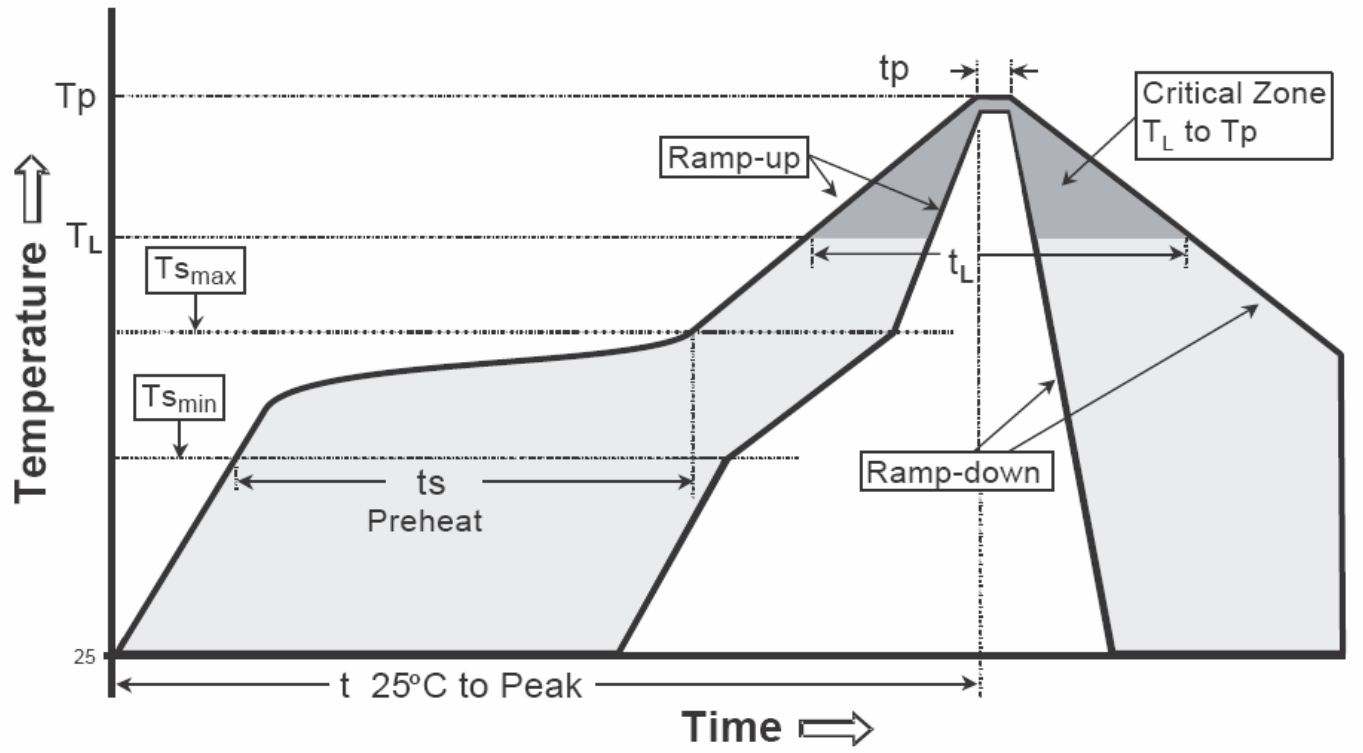


NOTES:
1.CARRIER TAPE COLOR : BLACK
2.COVER TAPE WIDTH:5.50+0.20
3.COVER TAPE COLOR:TRANSPARENT
5. ANTISTATIC COATED 10^5~ 10^{11}OHMS/SQ.
6.10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.20MAX.
7.CAMBER NOT TO EXCEED 1 MM IN 100 MM
8. ALL DIMS IN mm.
9. THE DERECTION OF VIEW:

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

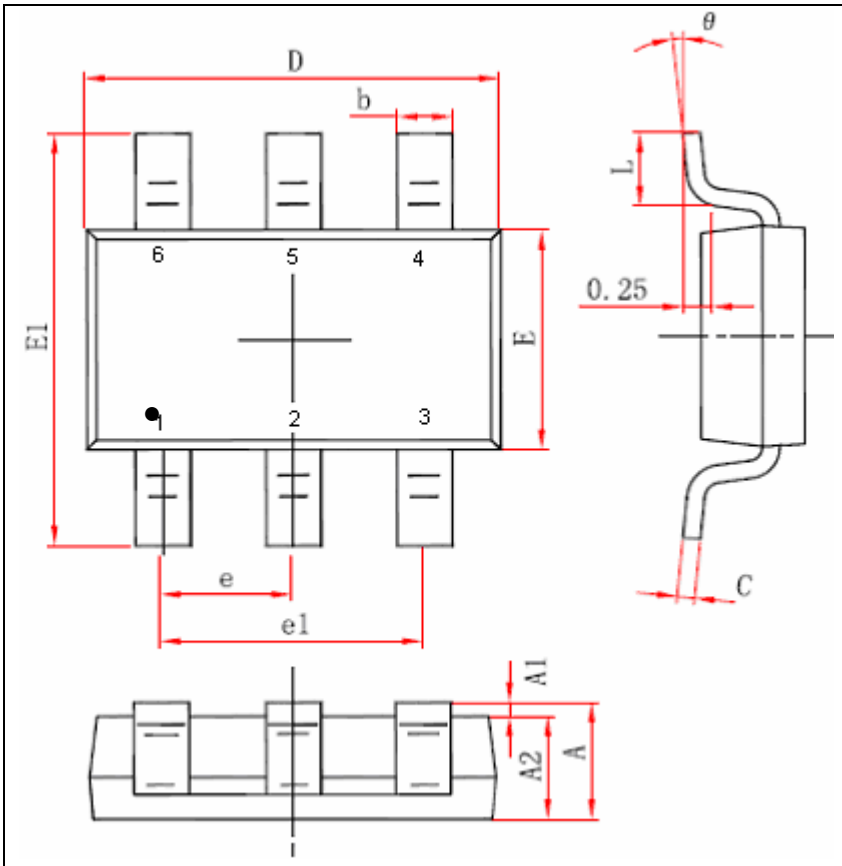
Recommended temperature profile for IR reflow

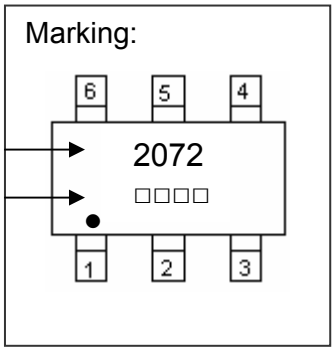


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

TSOP-6 Dimension





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

6-Lead TSOP-6 Plastic
Surface Mounted Package
CYStek Package Code: G6

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035	E	1.600	1.700	0.063	0.067
A1	0.000	0.100	0.000	0.004	E1	2.650	2.950	0.104	0.116
A2	0.700	0.800	0.028	0.031	e	0.95 (BSC)		0.037 (BSC)	
b	0.350	0.500	0.014	0.020	e1	1.90 (BSC)		0.075 (BSC)	
c	0.080	0.200	0.003	0.008	L	0.300	0.600	0.012	0.024
D	2.820	3.020	0.111	0.119	θ	0°	8°	0°	8°

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.