N- AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

MTC2804Q8

	N-CH	P-CH
BV_{DSS}	40V	-40V
I_D	7A	-6A
$R_{DSON(max)}$	28mΩ	44mΩ

Description

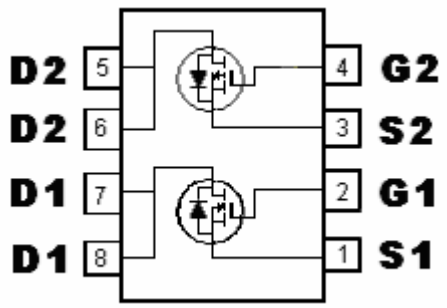
The MTC2804Q8 consists of a N-channel and a P-channel enhancement-mode MOSFET in a single SOP-8 package, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.
The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Features

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- RoHS compliant package

Equivalent Circuit

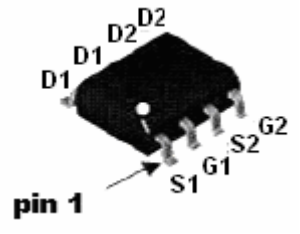
MTC2804Q8



G：Gate
S：Source
D：Drain

Outline

SOP-8



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

Parameter	Symbol	Limits		Unit
		N-channel	P-channel	
Drain-Source Breakdown Voltage	BV_{DSS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current @T_C=25 °C (Note 1)	I_D	7	-6	A
Continuous Drain Current @T_C=100 °C (Note 1)	I_D	6	-5	A
Pulsed Drain Current (Note 2)	I_{DM}	28	-24	A
Total Power Dissipation @T_A=25°C (Note 1)	Pd	2.4		W
Linear Derating Factor		0.016		W / °C
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+175		°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	62.5		°C/W
Thermal Resistance, Junction-to-Case	Rth,jc	25		°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, 135°C/W when mounted on minimum copper pad
2.Pulse width limited by maximum junction temperature

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	40	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	1.0	1.5	3.0	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=32V, V_{GS}=0
	-	-	25	μA	V_{DS}=30V, V_{GS}=0, Tj=125°C
*$R_{DS(ON)}$	-	25	28	mΩ	I_D=7A, V_{GS}=10V
	-	30	36		I_D=6A, V_{GS}=7V
*G_{FS}	-	19	-	S	V_{DS}=5V, I_D=7A
Dynamic					
Ciss	-	916	-	pF	V_{DS}=20V, V_{GS}=0, f=1MHz
Coss	-	79	-		
Crss	-	56	-		
*$t_{d(ON)}$	-	2.3	-	ns	V_{DS}=10V, I_D=1A, V_{GS}=10V, R_G=6Ω
*t_r	-	7.2	-		
*$t_{d(OFF)}$	-	11	-		
*t_f	-	6	-		
*Qg	-	9.1	-	nC	V_{DS}=20V, I_D=7A, V_{GS}=10V
*Qgs	-	2.3	-		
*Qgd	-	3	-		
Source-Drain Diode					
*V_{SD}	-	-	1.3	V	V_{GS}=0V, I_S=7A
*I_S	-	-	7	A	
*I_{SM}	-	-	20	A	

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

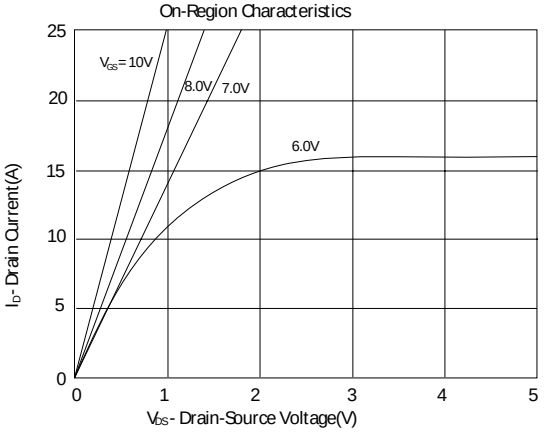
P-Channel Electrical Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-40	-	-	V	V_{GS}=0, I_D=-250μA
$V_{GS(th)}$	-1.0	-1.5	-3.0	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	-1	μA	V_{DS}=-32V, V_{GS}=0
	-	-	-25	μA	V_{DS}=-30V, V_{GS}=0, Tj=125°C
*$R_{DS(ON)}$	-	38	44	mΩ	I_D=-6A, V_{GS}=-10V
	-	46	55		I_D=-5A, V_{GS}=-7V
*G_{FS}	-	11	-	S	V_{DS}=-5V, I_D=-6A
Dynamic					
Ciss	-	1039	-	pF	V_{DS}=-20V, V_{GS}=0, f=1MHz
Coss	-	327	-		
Crss	-	301	-		
*$t_{d(ON)}$	-	6.5	-	ns	V_{DS}=-10V, I_D=-1A, V_{GS}=-10V, R_G=6Ω
*t_r	-	9.5	-		
*$t_{d(OFF)}$	-	18	-		
*t_f	-	10	-		
*Qg	-	9	-	nC	V_{DS}=-20V, I_D=-6A, V_{GS}=-10V
*Qgs	-	1.5	-		
*Qgd	-	2.9	-		
Source-Drain Diode					
*V_{SD}	-	-	-1.3	V	V_{GS}=0V, I_S=-6A
*I_S	-	-	-6	A	
*I_{SM}	-	-	-20		

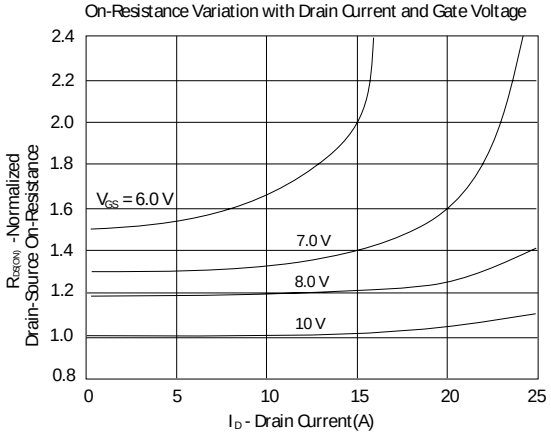
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

N-channel Characteristic Curves

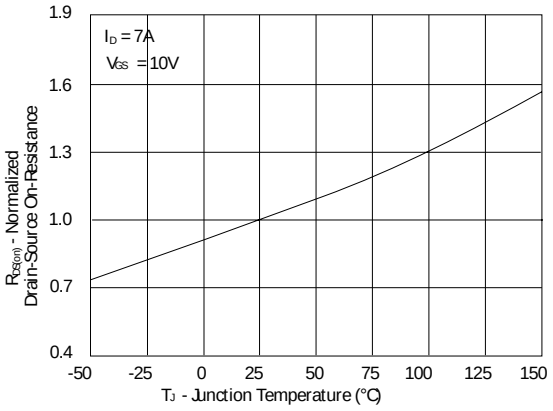
On-Region Characteristics



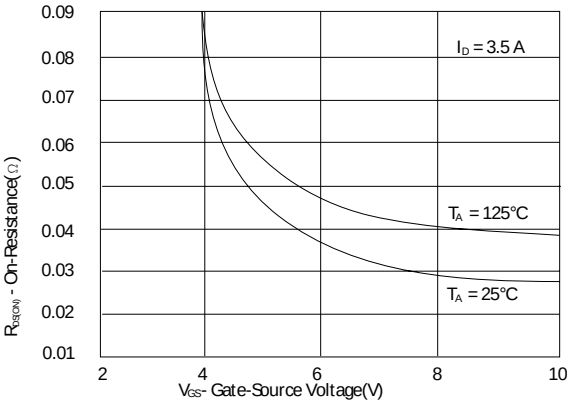
On-Resistance Variation with Drain Current and Gate Voltage



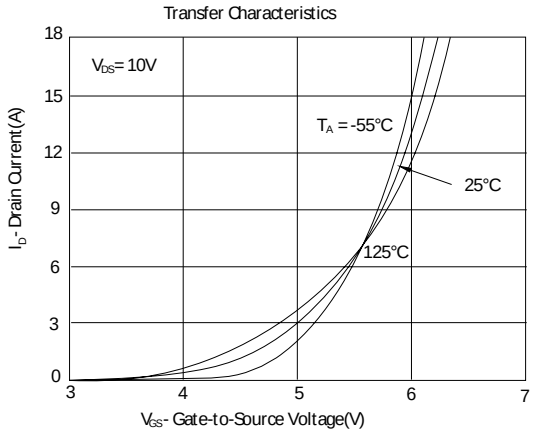
On-Resistance Variation with Temperature



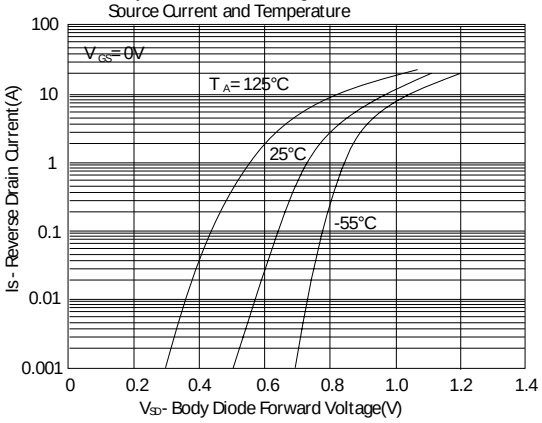
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics

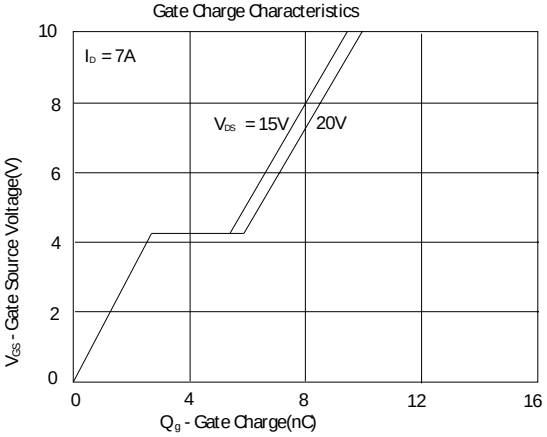


Body Diode Forward Voltage Variation with Source Current and Temperature

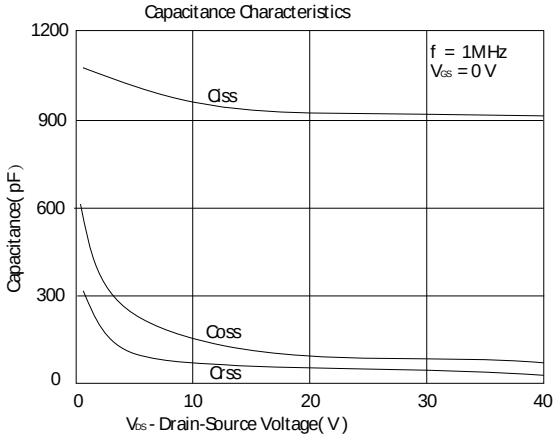


N-channel Characteristic Curves(Cont.)

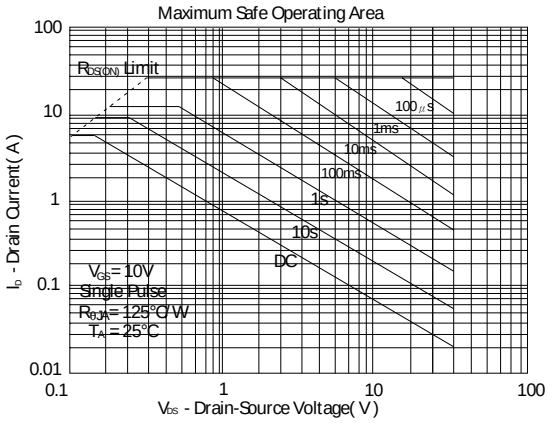
Gate Charge Characteristics



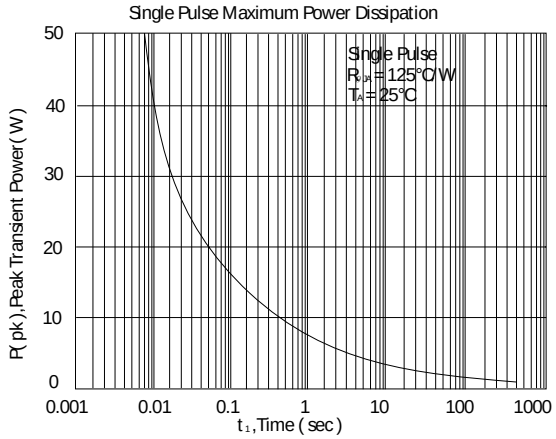
Capacitance Characteristics



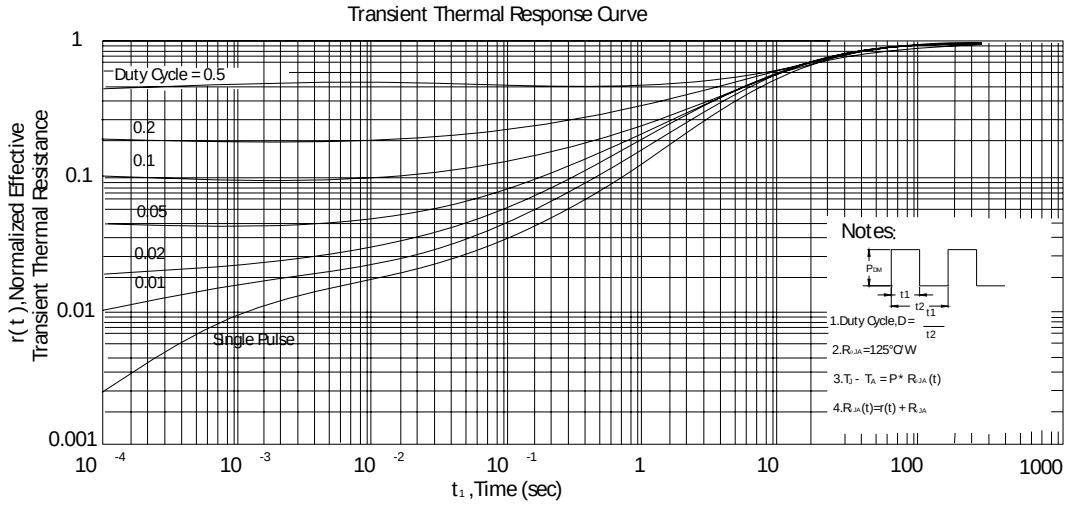
Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation

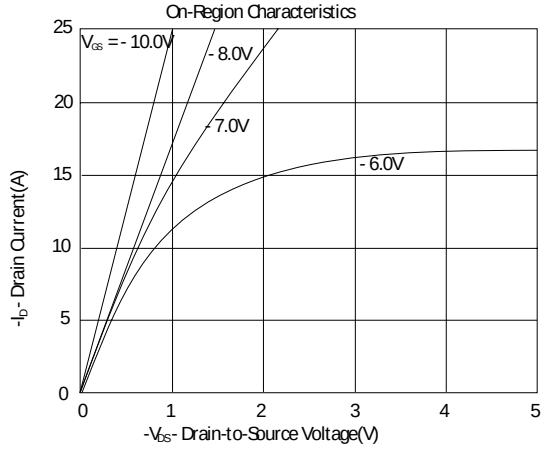


Transient Thermal Response Curve

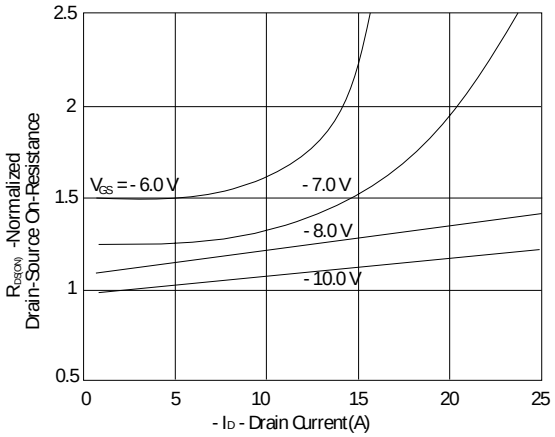


P-channel Characteristic Curves

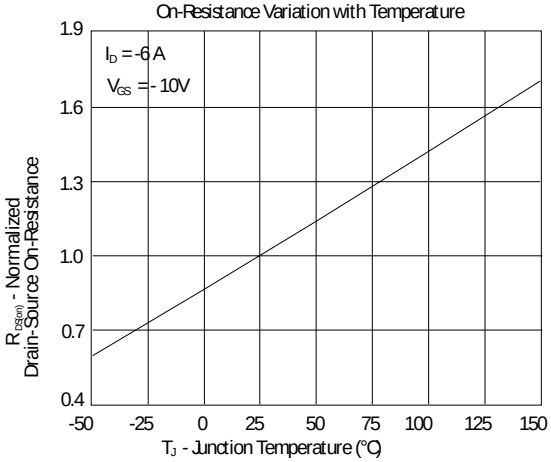
On-Region Characteristics



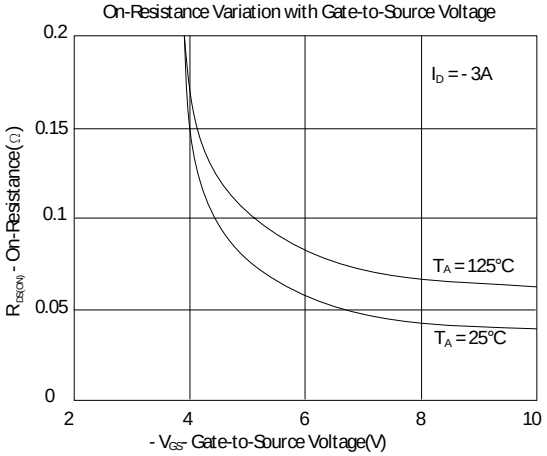
On-Resistance Variation with Drain Current and Gate Voltage



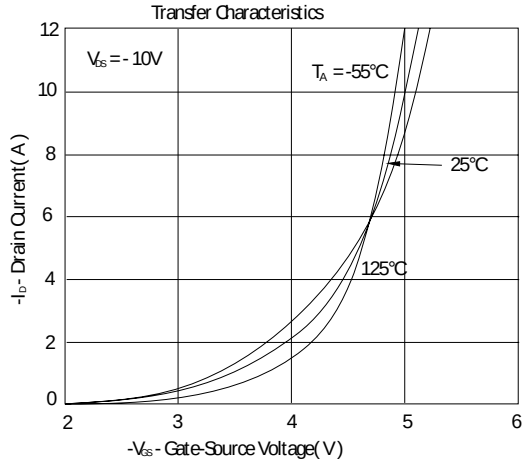
On-Resistance Variation with Temperature



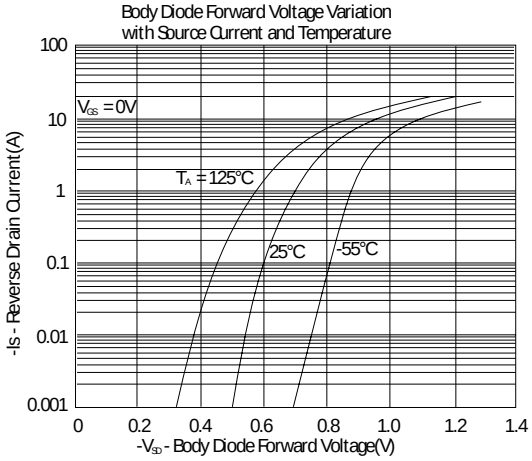
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics

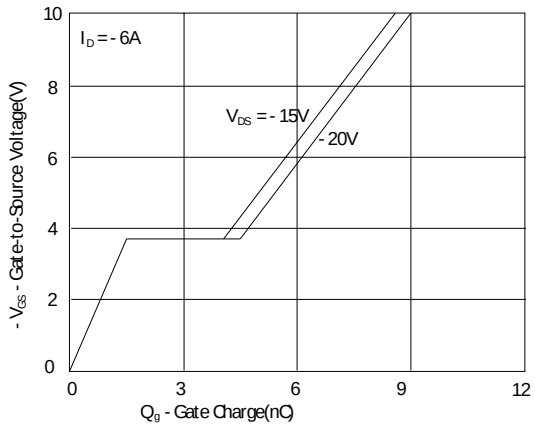


Body Diode Forward Voltage Variation with Source Current and Temperature

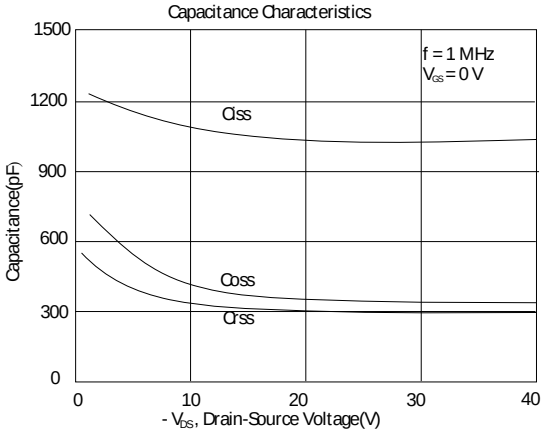


P-channel Characteristic Curves(Cont.)

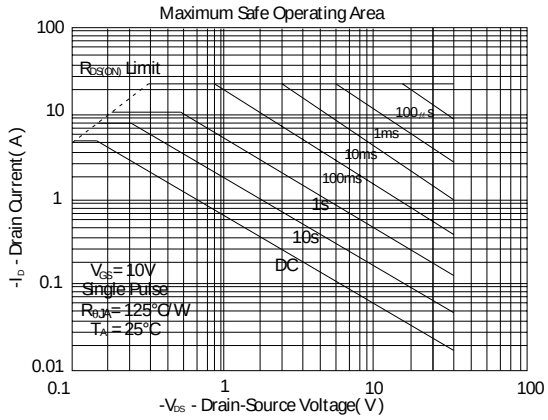
Gate Charge Characteristics



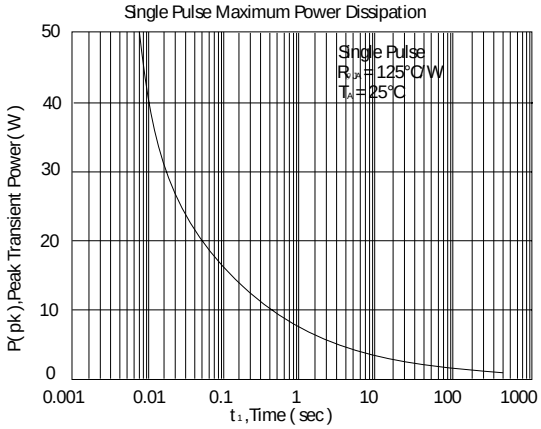
Capacitance Characteristics



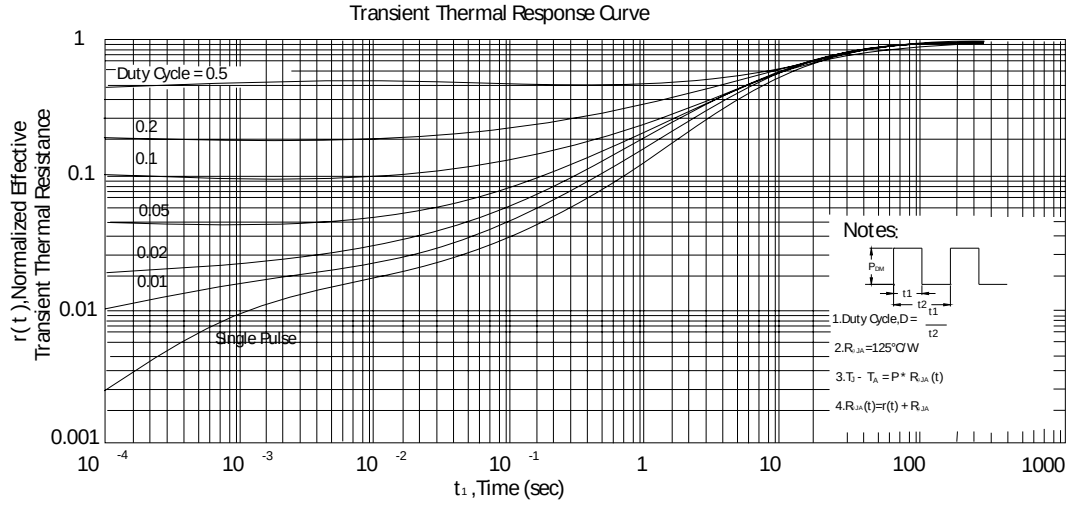
Maximum Safe Operating Area



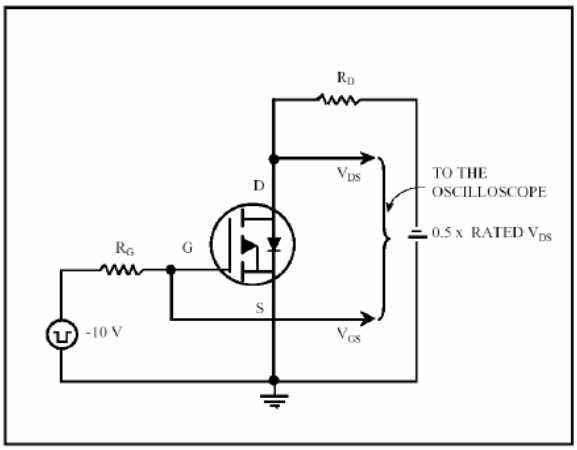
Single Pulse Maximum Power Dissipation

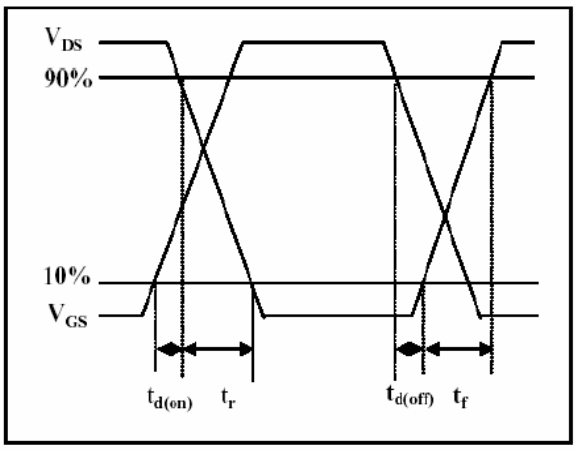


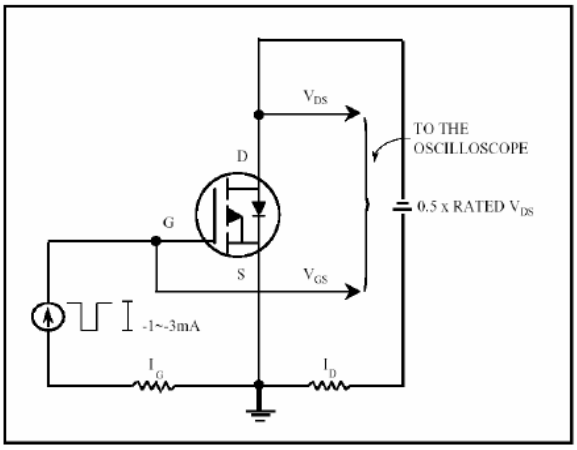
Transient Thermal Response Curve

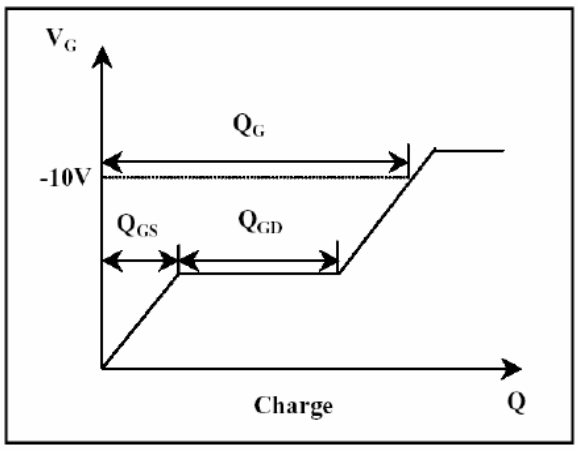


Test Circuit and Waveforms

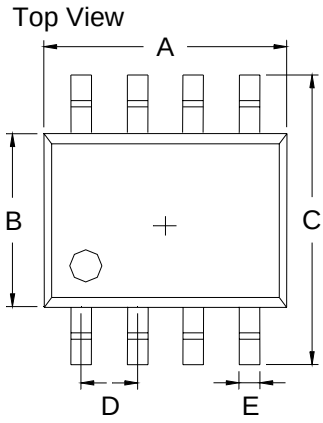


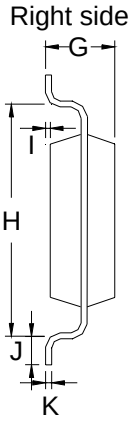


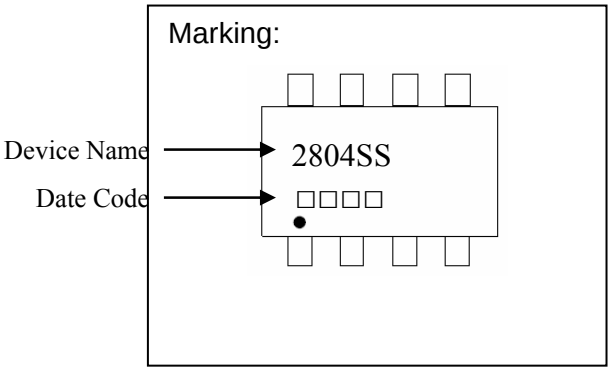


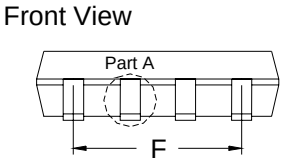


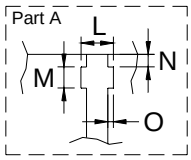
SOP-8 Dimension











8-Lead SOP-8 Plastic Package
CYStek 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					

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: KFC ; pure tin plated plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0