

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

MTP2603Q6

Description

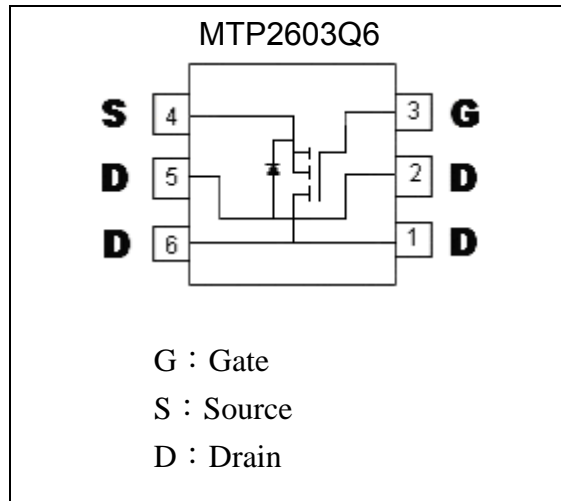
The MTP2603Q6 is a P-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness.

The TSOP-6 package is universally preferred for all commercial-industrial surface mount applications.

Features

- Simple drive requirement
- Low on-resistance
- Small package outline
- Pb-free package

Equivalent Circuit



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	VDS	-20	V
Gate-Source Voltage	VGS	±12	V
Continuous Drain Current @TA=25 °C (Note 1)	ID	-5	A
Continuous Drain Current @TA=70 °C (Note 1)	ID	-4	A
Pulsed Drain Current (Note 2, 3)	IDM	-20	A
Total Power Dissipation @ TA=25 °C Linear Derating Factor	Pd	2	W
		0.016	W / °C
Operating Junction Temperature	Tj	-55~+150	°C
Storage Temperature	Tstg	-55~+150	°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	62.5	°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board. 156°C/W when mounted on minimum copper pad.
 2.Pulse width limited by maximum junction temperature.
 3.Pulse Width ≤300µs, Duty Cycle≤2%



Electrical Characteristics (Ta=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{DSS}	-20	-	-	V	V _{GS} =0, I _D =-250μA
ΔBV _{DSS} /ΔT _j	-	-0.1	-	V/°C	Reference to 25°C, I _D =-1mA
V _{GS(th)}	-0.5	-	-1.2	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0
I _{DSS}	-	-	-1	μA	V _{DS} =-20V, V _{GS} =0, T _j =25°C
I _{DSS}	-	-	-10	μA	V _{DS} =-16V, V _{GS} =0, T _j =55°C
*R _{DS(ON)}	-	-	53	mΩ	I _D =-4.5A, V _{GS} =-10V
	-	-	65		I _D =-4.2A, V _{GS} =-4.5V
	-	-	120		I _D =-2.0A, V _{GS} =-2.5V
	-	-	250		I _D =-1.0A, V _{GS} =-1.8V
*G _{FS}	-	9	-	S	V _{DS} =-5V, I _D =-2.8A
C _{iss}	-	740	1200	pF	V _{DS} =-15V, V _{GS} =0, f=1MHz
C _{oss}	-	167	-		
C _{rss}	-	126	-		
t _{d(ON)}	-	5.9	-	ns	V _{DS} =-15V, I _D =-4.2A, V _{GS} =-10V, R _{GEN} =6Ω, R _D =3.6Ω
t _r	-	3.6	-	ns	
t _{d(OFF)}	-	32.4	-	ns	
t _f	-	2.6	-	ns	
Q _g	-	10.6	16	nC	V _{DS} =-16V, I _D =-4.2A, V _{GS} =-4.5V,
Q _{gs}	-	2.32	-	nC	
Q _{gd}	-	3.68	-	nC	

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

Source Drain Diode

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
*V _{SD}	-	-	-1.2	V	I _S =-1.2A, V _{GS} =0V
*T _{rr}	-	27.7	-	ns	I _S =-4.2A, V _{GS} =0V, dI/dt=100A/μs
Q _{rr}	-	22	-	nC	

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

Characteristic Curves

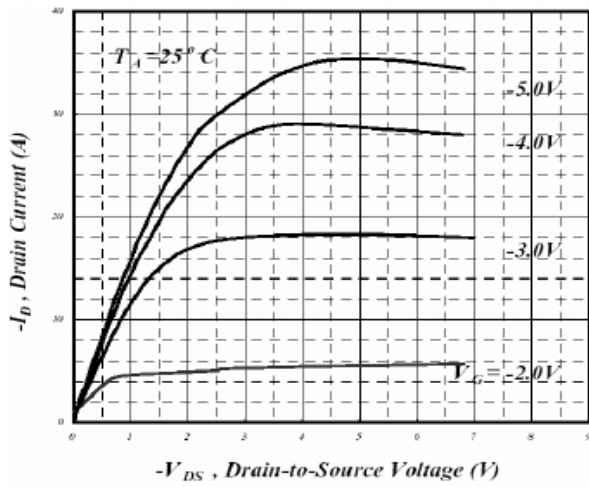


Fig 1. Typical Output Characteristics

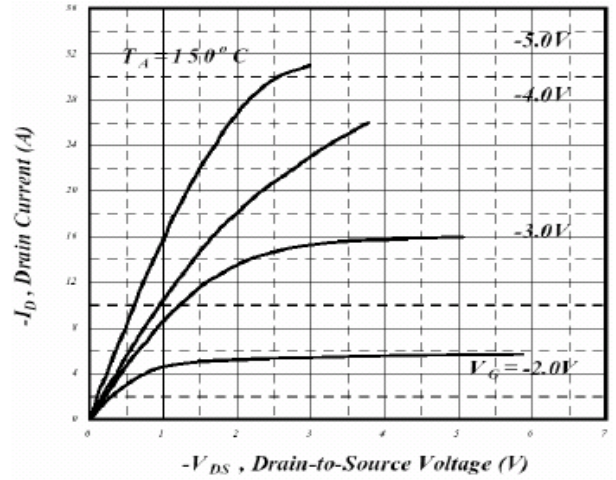


Fig 2. Typical Output Characteristics

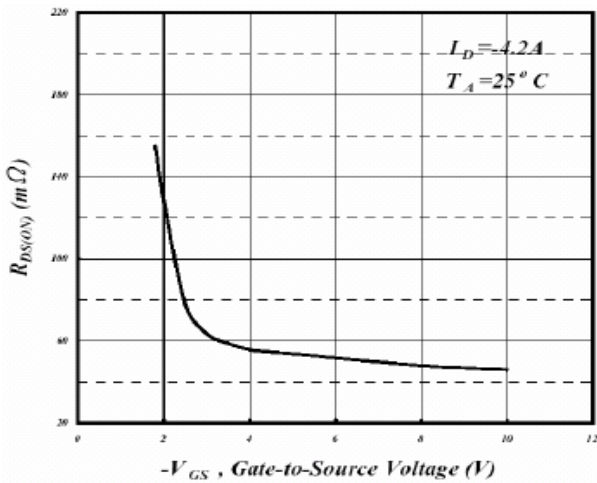


Fig 3. On-Resistance v.s. Gate Voltage

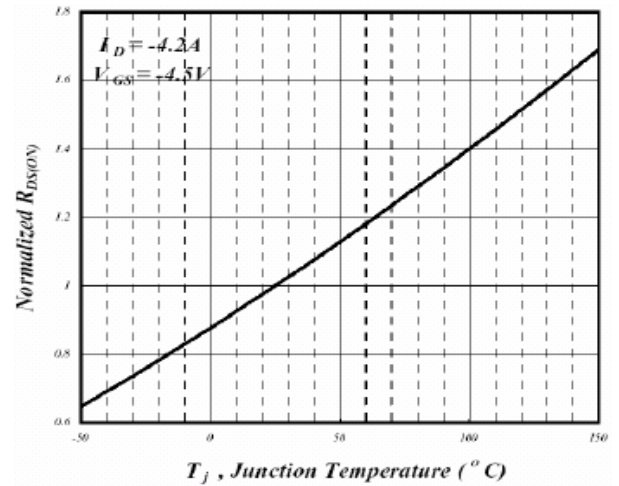


Fig 4. Normalized On-Resistance v.s. Junction Temperature

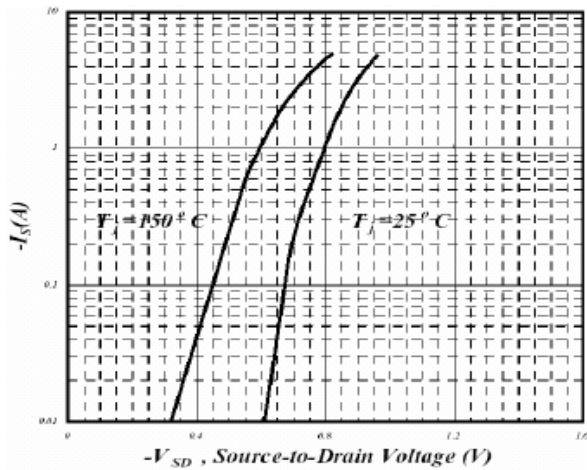


Fig 5. Forward Characteristics of Reverse Diode

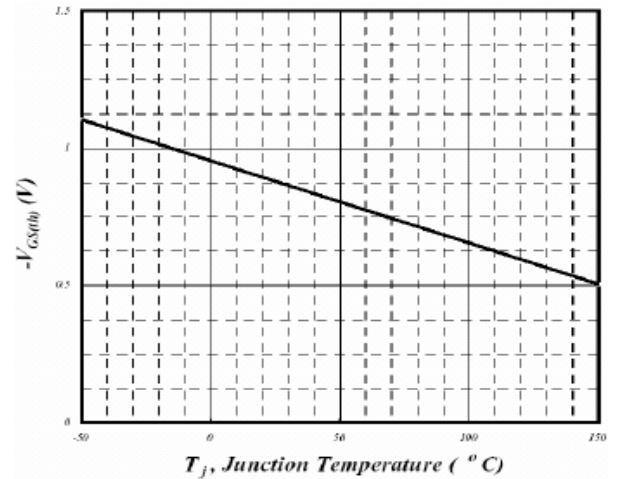


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Characteristic Curves(Cont.)

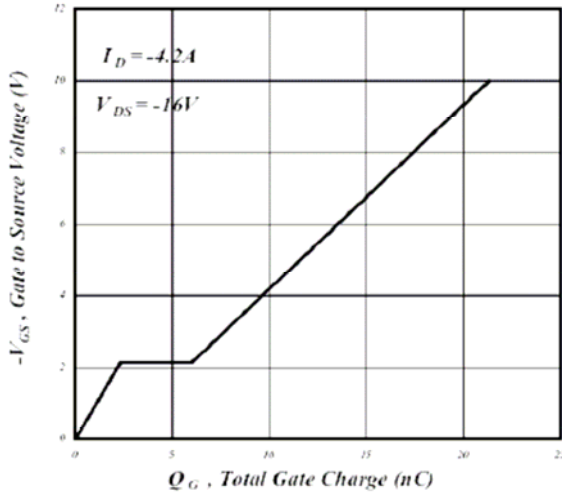


Fig 7. Gate Charge Characteristics

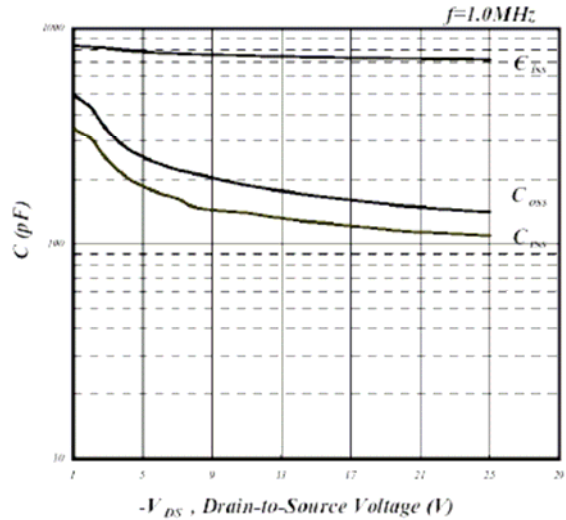


Fig 8. Typical Capacitance Characteristics

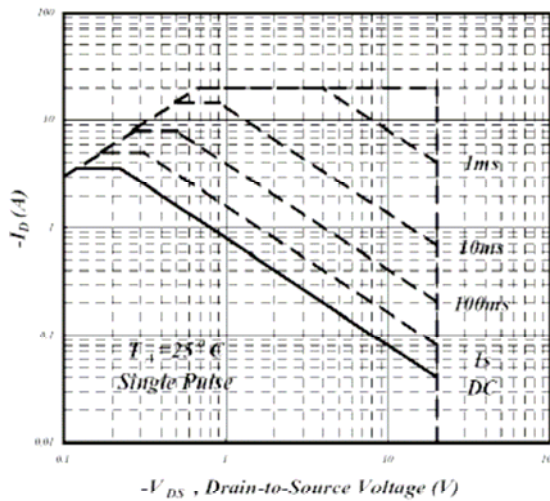


Fig 9. Maximum Safe Operating Area

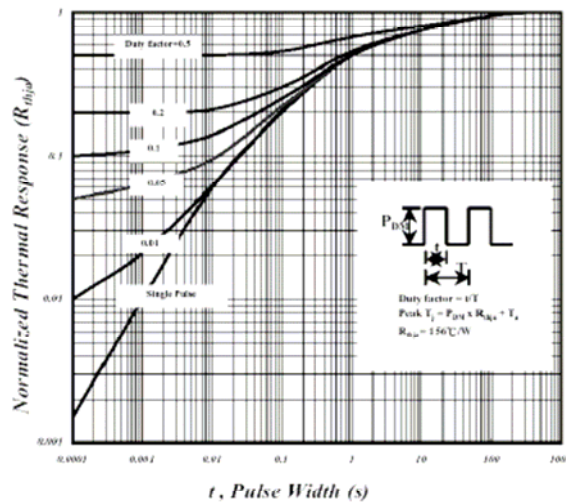


Fig 10. Effective Transient Thermal Impedance

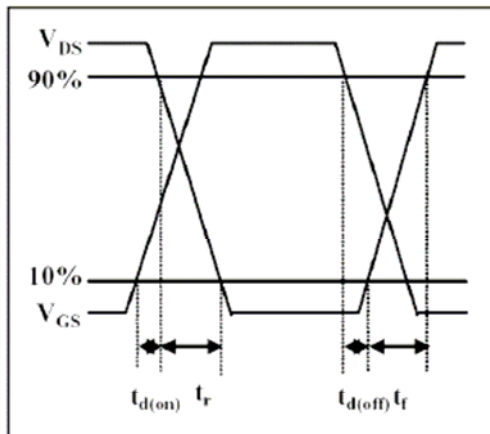


Fig 11. Switching Time Waveform

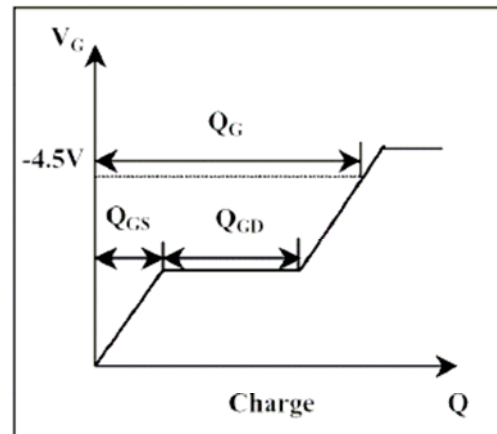
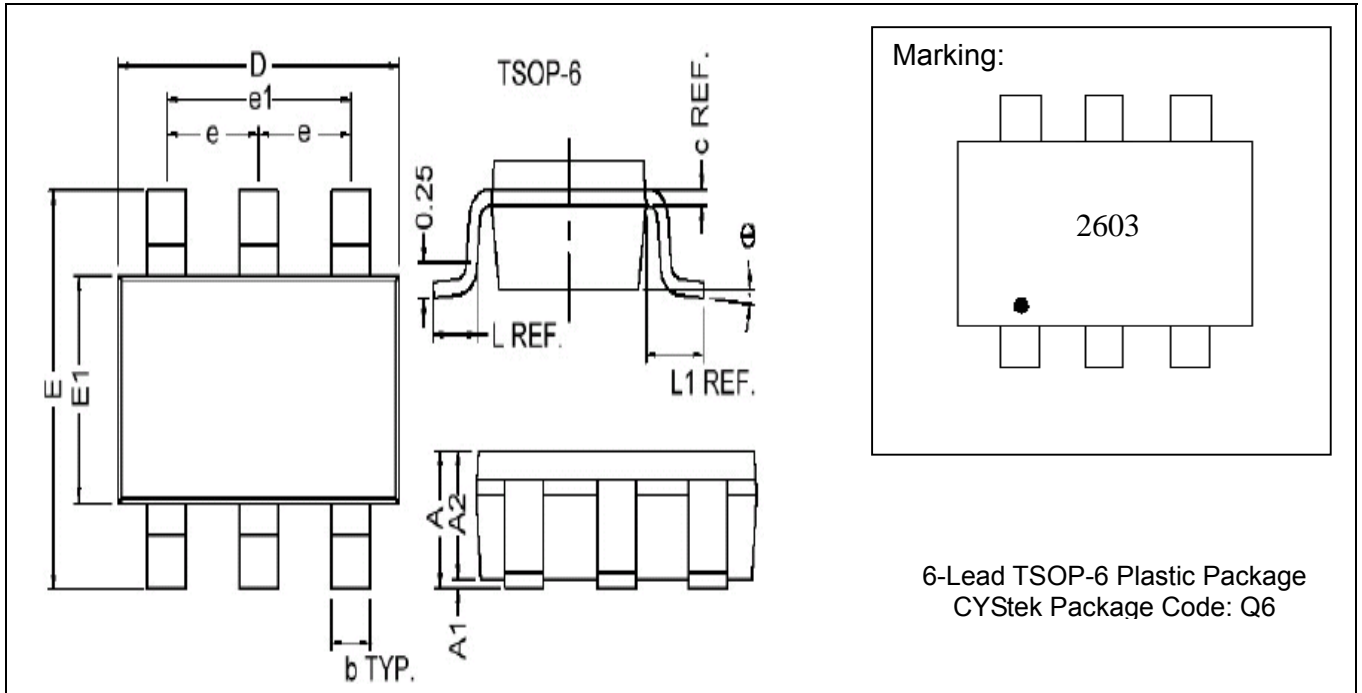


Fig 12. Gate Charge Waveform

TSOP-6 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	0.043	-	1.10	L	0.018 REF		0.45 REF	
A1	0.000	0.004	0.00	0.10	L1	0.024 REF		0.60 REF	
A2	0.028	0.039	0.70	1.00	θ	0°	10°	0°	10°
c	0.005 REF		0.12 REF		b	0.012	0.020	0.30	0.50
D	0.106	0.122	2.70	3.10	e	0.037 REF		0.95 REF	
E	0.102	0.118	2.60	3.00	E1	0.075 REF		1.90 REF	
E1	0.055	0.071	1.40	1.80					

- 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: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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