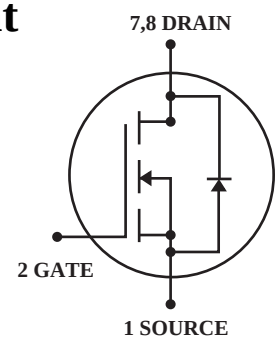
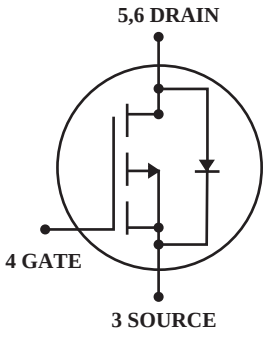
WEITRON

WTK4501

N AND P-Channel Enhancement Mode POWER MOSFET

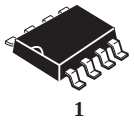
Lead(Pb)-Free





N-CHANNEL
DRAIN SOURCE VOLTAGE
30 VOLTAGE
DRAIN CURRENT
7 AMPERES

P-CHANNEL
DRAIN SOURCE VOLTAGE
-30 VOLTAGE
DRAIN CURRENT
-5.3 AMPERES



SOP-8

Features:

* Low Gate change
* Low On-Resistance
  N-CH $R_{DS(ON)}$<42mΩ@V_{GS} = 4.5V
  P-CH $R_{DS(ON)}$<90mΩ@V_{GS} = -4.5V
* SOP-8 Package

Maximum Ratings (T_A=25˚C Unless Otherwise Specified)

Rating	Symbol	Value		Unit
		N-Channl	P-Channl	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	±20	±16	V
Continuous Drain Current[3] T_A=25˚C T_A=75˚C	I_D	7 5.8	-5.3 -4.7	A
Pulsed Drain Current[1]	I_{DM}	20	-20	A
Total Power Dissipation T_A=25˚C	P_D	2.0		W
Maximum Junction-ambient[3]	$R_{\theta JA}$	62.5		˚C/W
Operating Junction Temperature Range	T_J	+150		˚C
Storage Temperature Range	T_{stg}	-55~+150		˚C

Device Marking

WTK4501=4501SS

N-Channel Electrical Characteristics (T_A = 25°C Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF Characteristics					
Drain-Source Breakdown Voltage V_{GS}=0,I_D=250μA	BV_{DSS}	30	-	-	V
Drain-Source Leakage Current Tj=25°C, V_{DS}=30V, V_{GS}=0V Tj=70°C, V_{DS}=24V, V_{GS}=0V	I_{DSS}	- -	- -	1 25	μA
Gate-Source Leakage current V_{GS}=±20V	I_{GSS}	-	-	±100	nA
ON Characteristics					
Gate-Source Threshold Voltage V_{DS}=V_{GS}, I_D=250μA	$V_{GS(Th)}$	1.0	-	3.0	V
Drain-Source On-Resistance V_{GS}=10V,I_D=7A V_{GS}=4.5V,I_D=5A	$R_{DS(on)}$	- -	- -	28 42	mΩ
Forward Transconductance V_{DS}=10V,I_D=7A	g_{fs}	-	13	-	S
Dymamic Characteristics					
Input Capacitance V_{GS}=0V, V_{DS}=20V, f=1.0MHz	C_{iss}	-	645	-	pF
Output Capacitance V_{GS}=0V, V_{DS}=20V, f=1.0MHz	C_{oss}	-	150	-	
Reverse Transfer Capacitance V_{GS}=0V, V_{DS}=20V, f=1.0MHz	C_{rss}	-	95	-	
Switching Characteristics					
Turn-on Delay Time[2] V_{DS}=15V, V_{GS}=10V, I_D=1A, R_G=3.3Ω, R_D=15Ω	$t_{d(on)}$	-	6	-	ns
Rise Time V_{DS}=15V, V_{GS}=10V, I_D=1A, R_G=3.3Ω, R_D=15Ω	t_r	-	5.2	-	
Turn-off Delay Time V_{DS}=15V, V_{GS}=10V, I_D=1A, R_G=3.3Ω, R_D=15Ω	$t_{d(off)}$	-	18.8	-	
Fall Time V_{DS}=15V, V_{GS}=10V, I_D=1A, R_G=3.3Ω, R_D=15Ω	t_f	-	4.4	-	
Total Gate Charge[2] V_{DS}=24V,V_{GS}=4.5V,I_D=7A	Q_g	-	8.4	-	nC
Gate-Source Charge V_{DS}=24V,V_{GS}=4.5V,I_D=7A	Q_{gs}	-	2.1	-	
Gate-Source Change V_{DS}=24V,V_{GS}=4.5V,I_D=7A	Q_{gd}	-	4.7	-	
Source-Drain Diode Characteristics					
Forward On Voltage[2] I_S=7A, V_{GS}=0V	V_{SD}	-	-	1.2	V
Continuous Source Current(Body diode) V_D=V_G=0V, V_S=1.2V	I_S	-	-	1.67	A

Note: 1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on 1 in² copper pad of FR4 board, 135°C/W when mounted on Min. copper pad.

WEITRON

P-Channel Electrical Characteristics (T_A = 25°C Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF Characteristics					
Drain-Source Breakdown Voltage V_{GS}=0,I_D=-250μA	BV_{DSS}	-30	-	-	V
Drain-Source Leakage Current Tj=25°C, V_{DS}=-30V, V_{GS}=0V Tj=70°C, V_{DS}=-24V, V_{GS}=0V	I_{DSS}	- -	- -	-1 -25	μA
Gate-Source Leakage current V_{GS}=±16V	I_{GSS}	-	-	±100	nA
ON Characteristics					
Gate-Source Threshold Voltage V_{DS}=V_{GS}, I_D=-250μA	$V_{GS(Th)}$	-1.0	-	-3.0	V
Drain-Source On-Resistance[2] V_{GS}=-10V, I_D=-5.3A V_{GS}=-4.5V, I_D=-4.2A	$R_{DS(on)}$	- -	- -	50 90	mΩ
Forward Transconductance V_{DS}=-10V,I_D=-5.3A	g_{fs}	-	8.5	-	S
Dymamic Characteristics					
Input Capacitance V_{GS}=0V, V_{DS}=-15V, f=1.0MHz	C_{iss}	-	790	-	pF
Output Capacitance V_{GS}=0V, V_{DS}=-15V, f=1.0MHz	C_{oss}	-	440	-	
Reverse Transfer Capacitance V_{GS}=0V, V_{DS}=-15V, f=1.0MHz	C_{rss}	-	120	-	
Switching Characteristics					
Turn-on Delay Time[2] V_{DS}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω, R_D=15Ω	$t_{d(on)}$	-	12	-	ns
Rise Time V_{DS}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω, R_D=15Ω	t_r	-	20	-	
Turn-off Delay Time V_{DS}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω, R_D=15Ω	$t_{d(off)}$	-	45	-	
Fall Time V_{DS}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω, R_D=15Ω	t_f	-	27	-	
Total Gate Charge[2] V_{DS}=-15V, V_{GS}=-10V, I_D=-5.3A	Q_g	-	20	-	nC
Gate-Source Charge V_{DS}=-15V, V_{GS}=-10V, I_D=-5.3A	Q_{gs}	-	3.5	-	
Gate-Source Change V_{DS}=-15V, V_{GS}=-10V, I_D=-5.3A	Q_{gd}	-	2	-	
Source-Drain Diode Characteristics					
Forward On Voltage[2] I_S=-2.6A, V_{GS}=0V	V_{SD}	-	-	-1.2	V
Continuous Source Current(Body Diode) V_D=V_G=0V, V_S=-1.2V	I_S	-	-	-1.67	A

Note: 1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on 1 in² copper pad of FR4 board, 135°C/W when mounted on Min. copper pad.

Characteristics Curve N-Channel

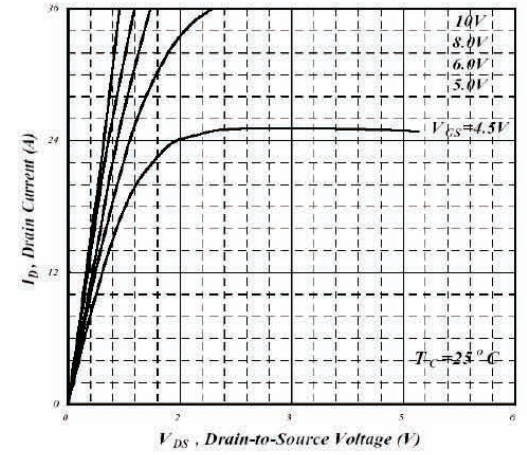


Fig 1. Typical Output Characteristics

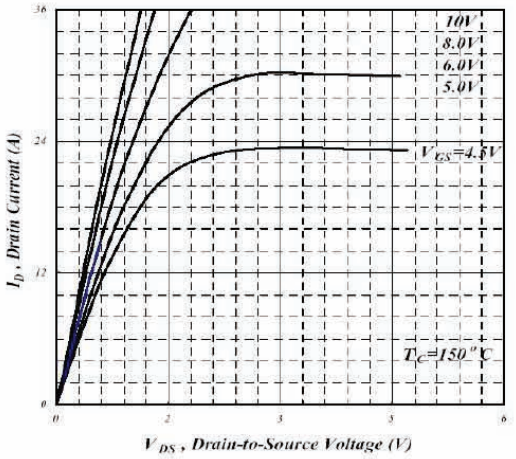


Fig 2. Typical Output Characteristics

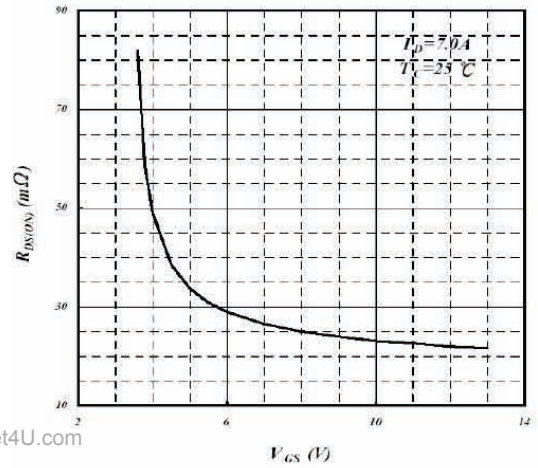


Fig 3. On-Resistance v.s. Gate Voltage

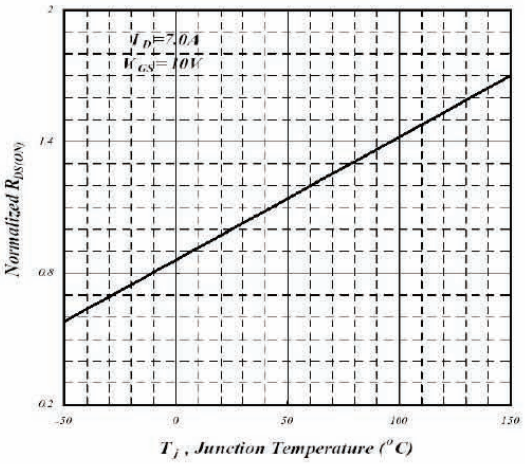


Fig 4. Normalized On-Resistance v.s. Junction Temperature

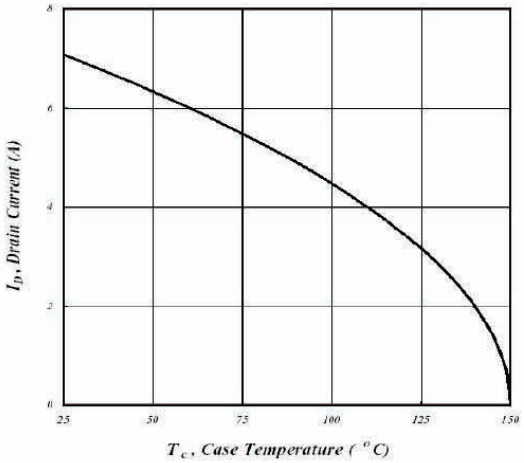


Fig 5. Maximum Drain Current v.s. Case Temperature

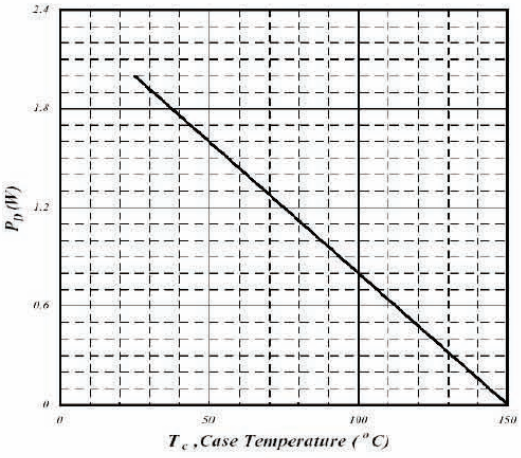


Fig 6. Type Power Dissipation

N-Channel

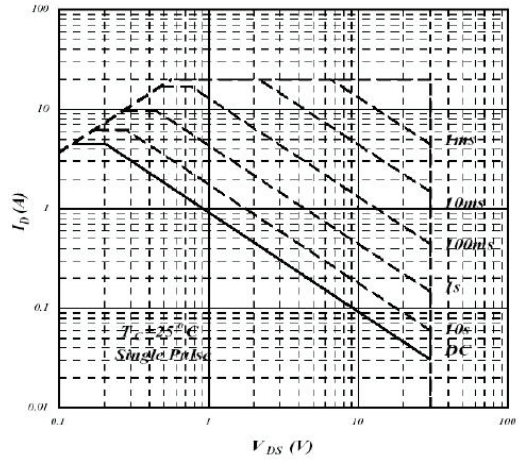


Fig 7. Maximum Safe Operating Area

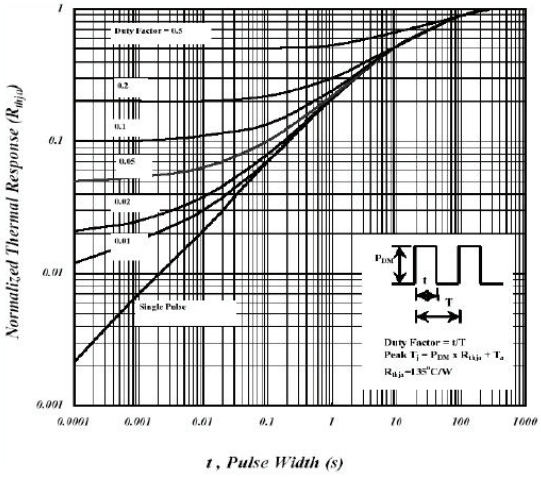


Fig 8. Effective Transient Thermal Impedance

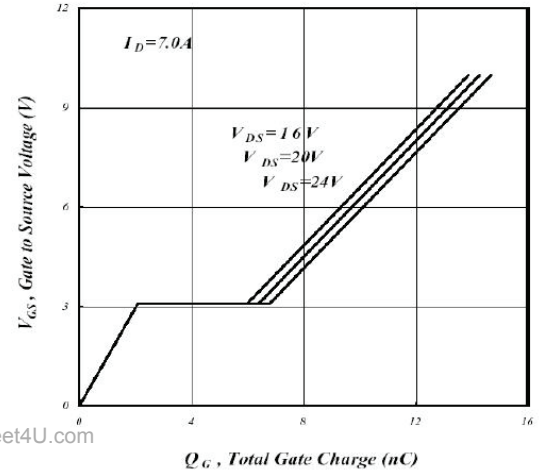


Fig 9. Gate Charge Characteristics

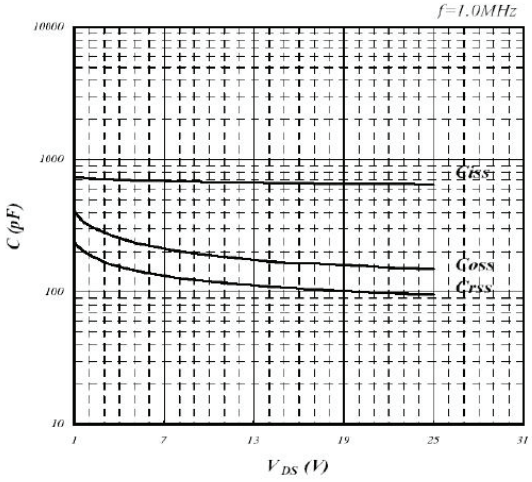


Fig 10. Typical Capacitance Characteristics

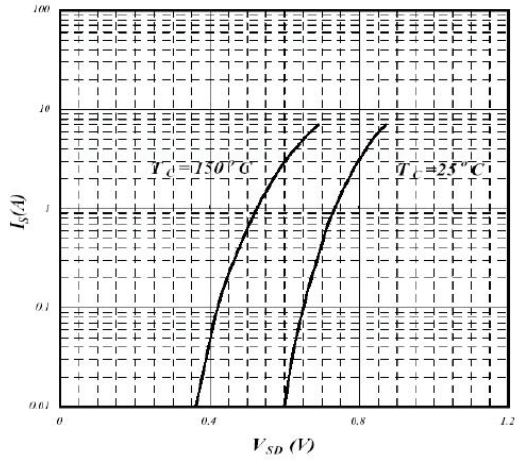


Fig 11. Forward Characteristics of Reverse Diode

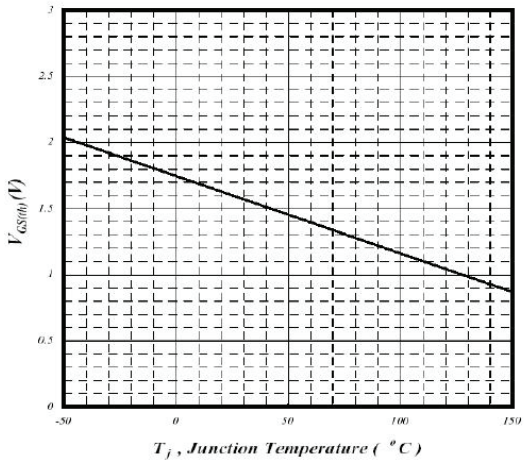


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

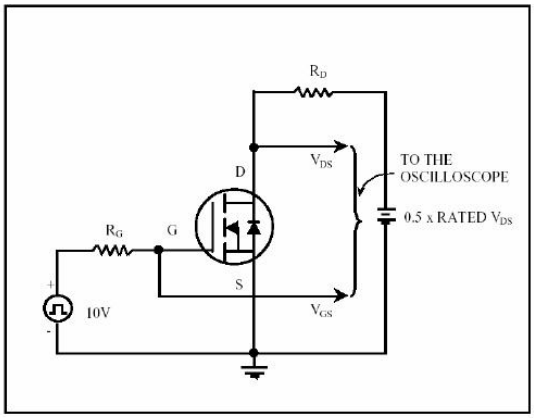


Fig 13. Switching Time Circuit

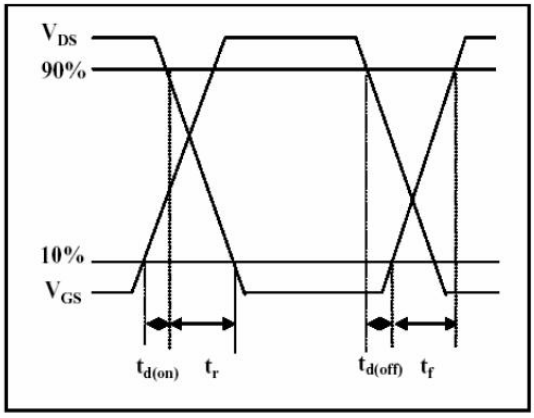


Fig 14. Switching Time Waveform

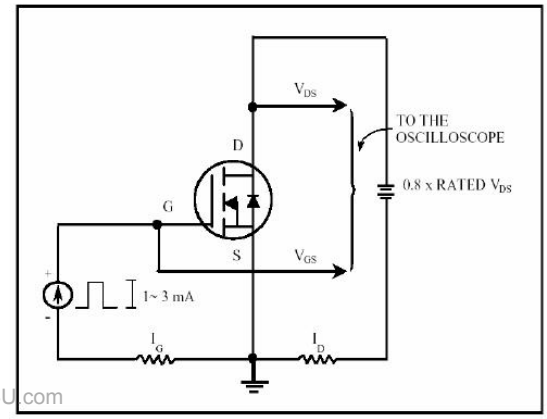


Fig 15. Gate Charge Circuit

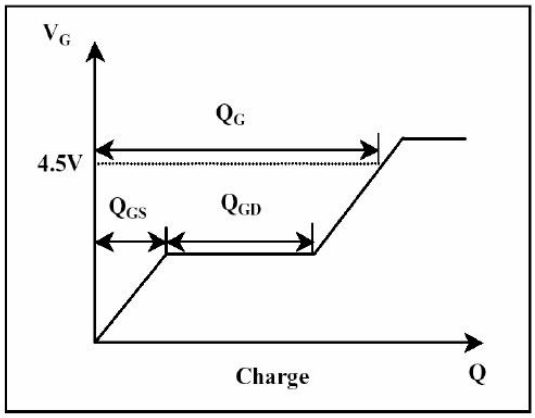


Fig 16. Gate Charge Waveform

Characteristics Curve P-Channel

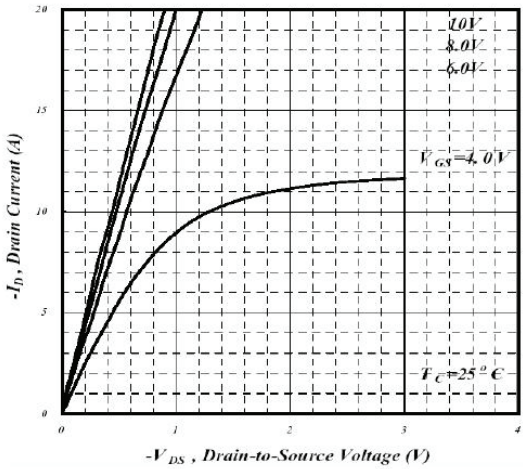


Fig 1. Typical Output Characteristics

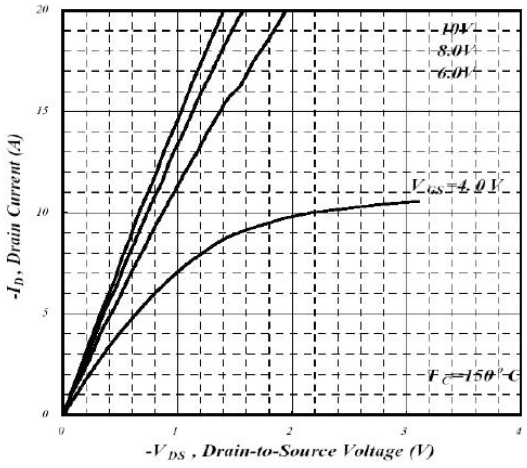


Fig 2. Typical Output Characteristics

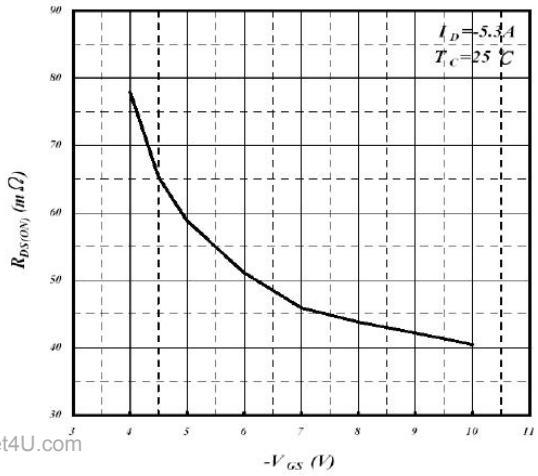


Fig 3. On-Resistance v.s. Gate Voltage

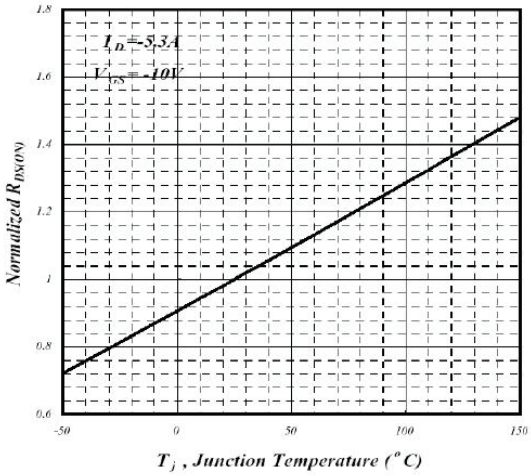


Fig 4. Normalized On-Resistance v.s. Junction Temperature

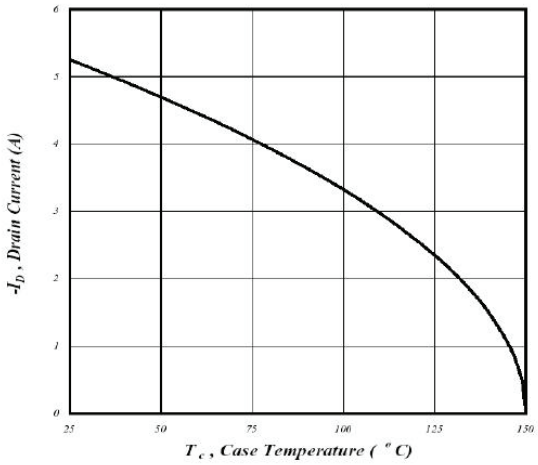


Fig 5. Maximum Drain Current v.s. Case Temperature

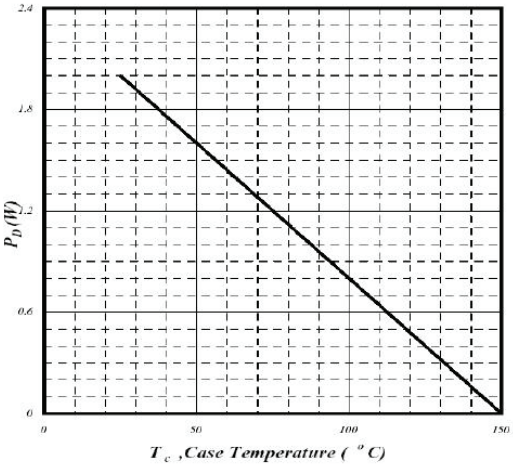


Fig 6. Type Power Dissipation

P-Channel

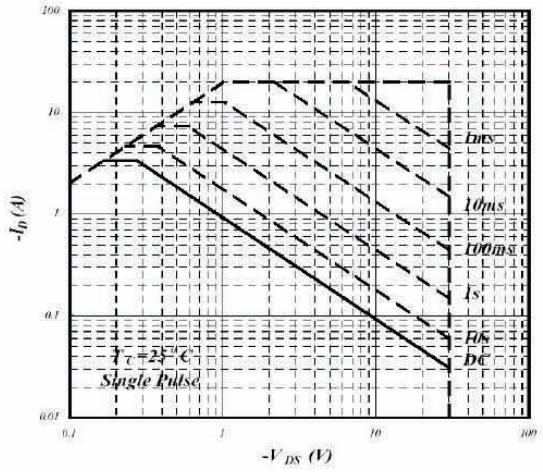


Fig 7. Maximum Safe Operating Area

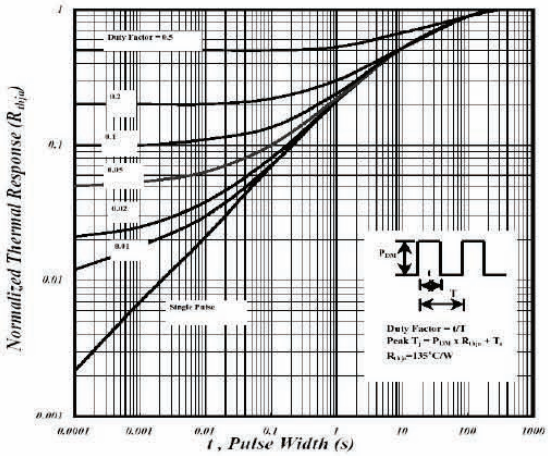


Fig 8. Effective Transient Thermal Impedance

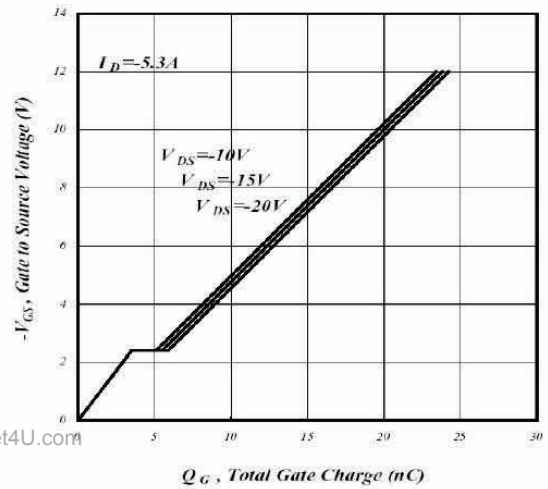


Fig 9. Gate Charge Characteristics

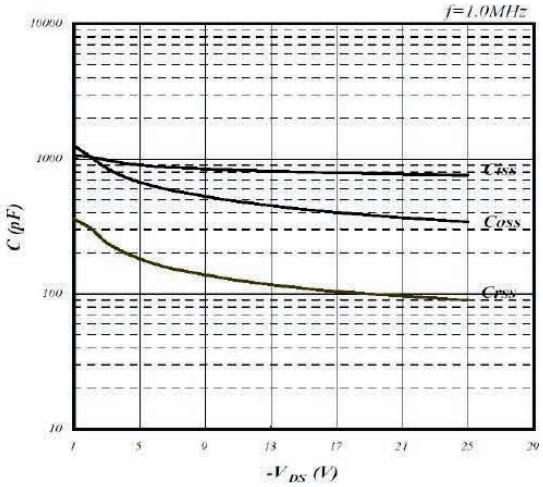


Fig 10. Typical Capacitance Characteristics

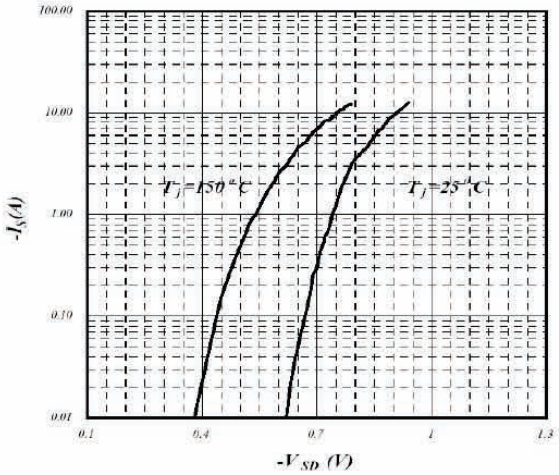


Fig 11. Forward Characteristics of Reverse Diode

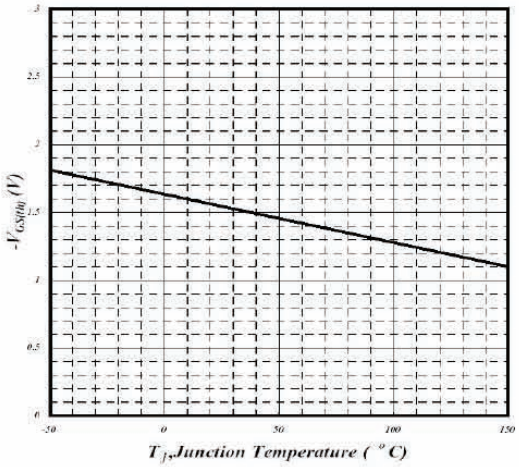


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

P-Channel

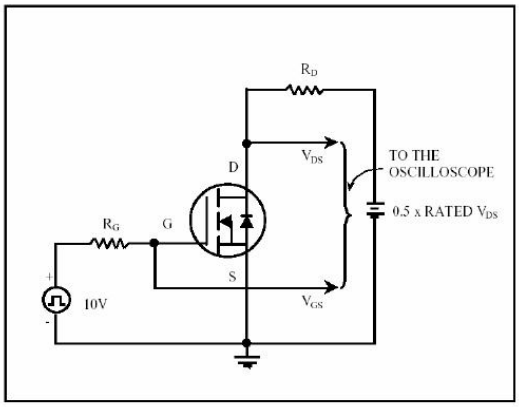


Fig 13. Switching Time Circuit

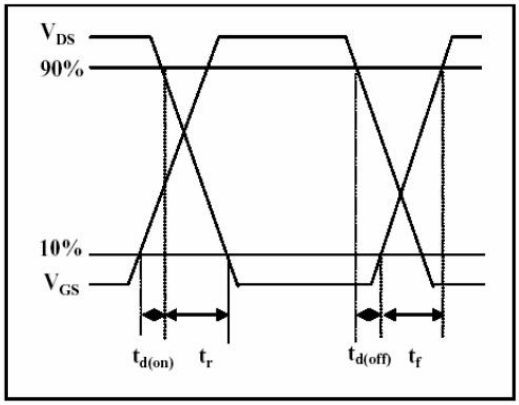


Fig 14. Switching Time Waveform

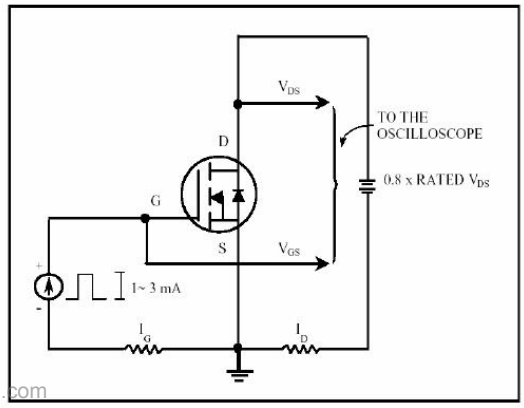


Fig 15. Gate Charge Circuit

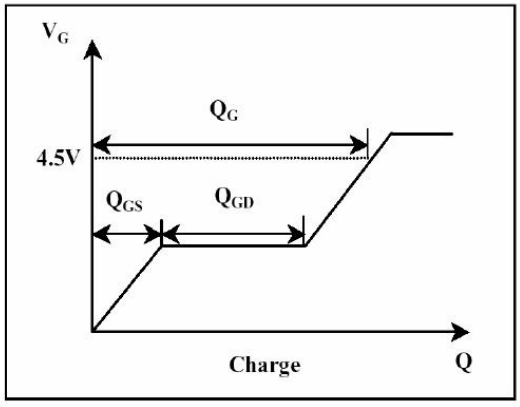
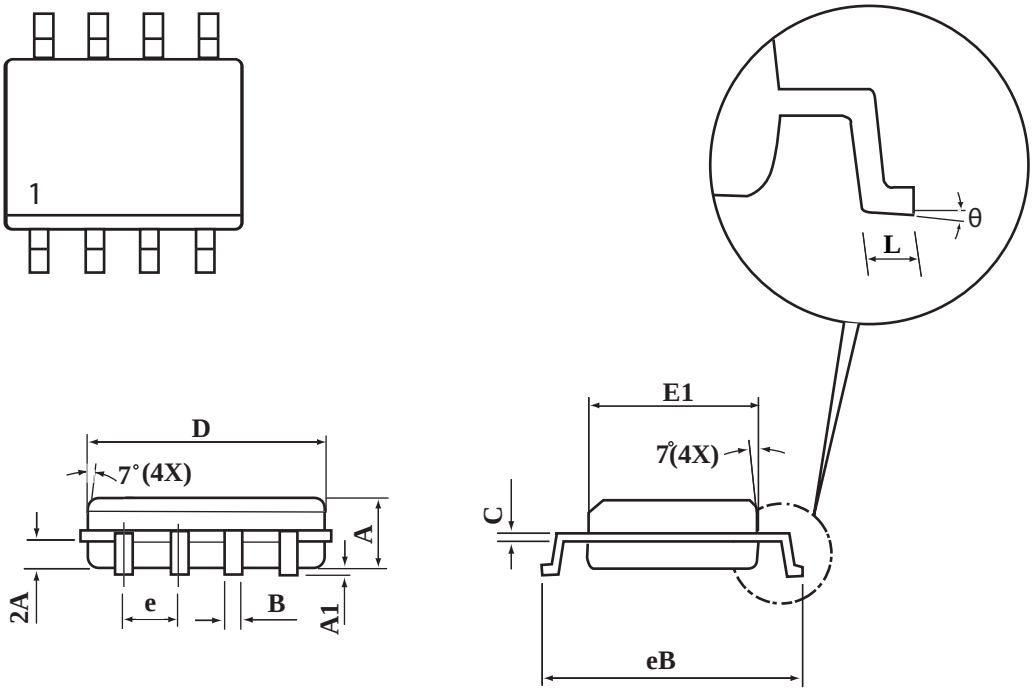


Fig 16. Gate Charge Waveform

SOP-8 Package Outline Dimensions

Unit:mm



SYMBOLS	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.20
B	0.35	0.45
C	0.18	0.23
D	4.69	4.98
E1	3.56	4.06
eB	5.70	6.30
e	1.27 BSC	
L	0.60	0.80
θ	0°	8°