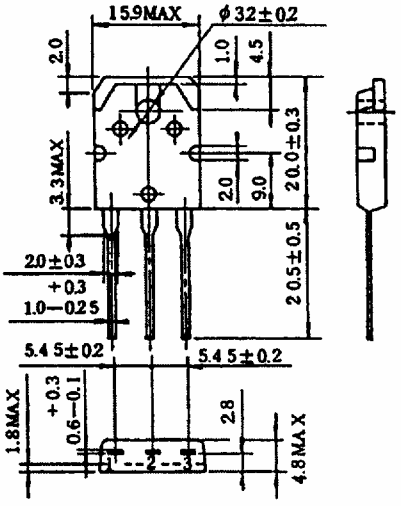
Field Effect Transistor

Silicon N Channel MOS Type (π-MOS II.5)

High Speed, High Current Switching Applications

Industrial Applications **Unit in mm**



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	SC-65
TOSHIBA	2-16C1B

Weight : 4.6g

Features

- Low Drain-Source ON Resistance
  - $R_{DS(ON)}$ = 1.0Ω (Typ.)
- High Forward Transfer Admittance
  - $|Y_{fs}|$ = 4.0S (Typ.)
- Low Leakage Current
  - I_{DSS} = 300μA (Max.) (V_{DS} = 0V)
- Enhancement-Mode
  - V_{th} = 1.5 ~ 3.5V (V_{DS} = 10V, I_D = 1mA)

Absolute Maximum Ratings (Ta = 25°C)

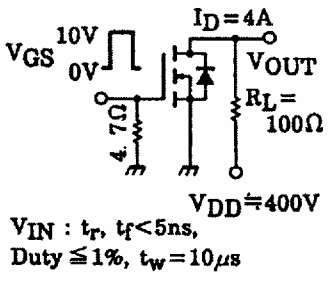
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	800	V
Drain-Gate Voltage (R_{GS} = 20kΩ)		V_{DGR}	800	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	DC	I_D	9	A
	Pulse	I_{DP}	27	
Drain Power Dissipation (Tc = 25°C)		P_D	150	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	°C/W

This transister is an electrostatic sensitive device. Please handle with caution.

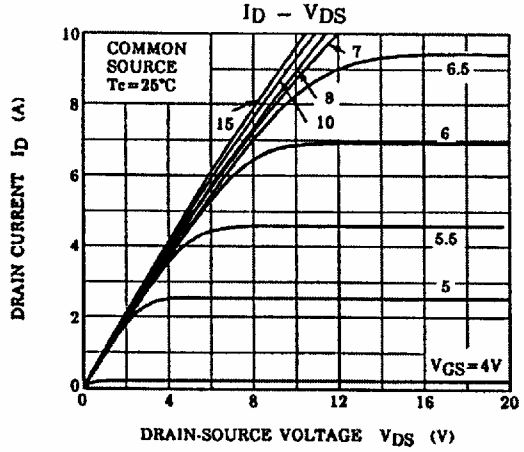
Electrical Characteristics (Ta = 25C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V	–	–	±100	nA
Drain Cut-off Current		I_{DSS}	V_{DS} = 800V, V_{GS} = 0V	–	–	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\ DSS}$	I_D = 10mA, V_{GS} = 0V	800	–	–	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10V, I_D = 1mA	1.5	–	3.5	V
Drain-Source ON Resistance		$R_{DS\ (ON)}$	V_{GS} = 10V, I_D = 4A	–	1.0	1.2	Ω
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 15V, I_D = 4A	2.0	40	–	S
Input Capacitance		C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	–	1150	–	pF
Reverse Transfer Capacitance		C_{rss}		–	135	–	
Output Capacitance		C_{oss}		–	210	–	
Switching Time	Rise Time	t_r		–	35	–	ns
	Turn-on Time	t_{on}		–	55	–	
	Fall Time	t_f		–	25	–	
	Turn-off Time	t_{off}		–	100	–	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} = 400V, V_{GS} = -10V, I_D = 9A	–	85	–	nC
Gate-Source Charge		Q_{gs}		–	40	–	
Gate-Drain ("Miller") Charge		Q_{gd}		–	45	–	

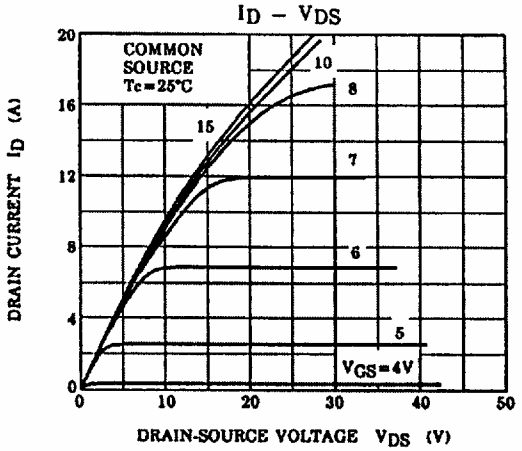
Source-Drain Diode Ratings and Characteristics (Ta = 25C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	–	–	–	9	A
Pulse Drain Reverse Current	I_{DRP}	–	–	–	27	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 9A, V_{GS} = 0V	–	–	-2.0	V
Reverse Recovery Time	t_{rr}	I_{DR} = 9A, V_{GS} = 0V, dI_{DR}/dt = 100A/μs	–	300	–	ns
Reverse Recovered Charge	Q_{rr}		–	26	–	μC

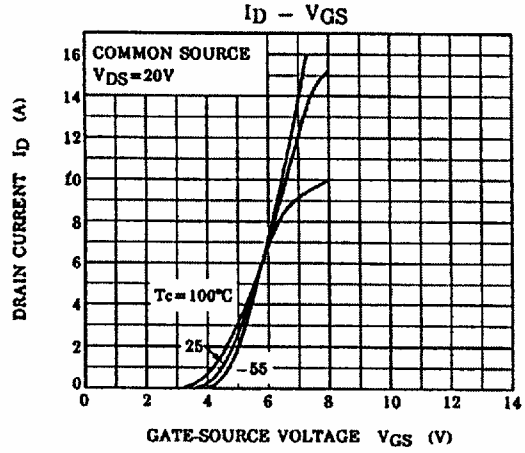
$I_D - V_{DS}$



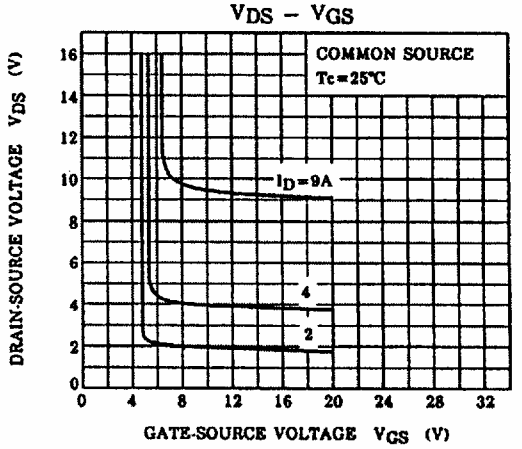
$I_D - V_{DS}$



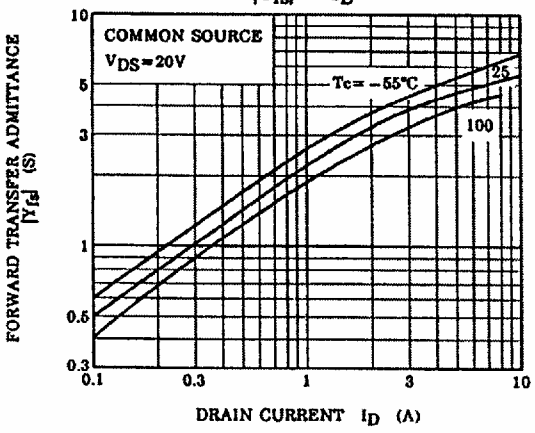
$I_D - V_{GS}$



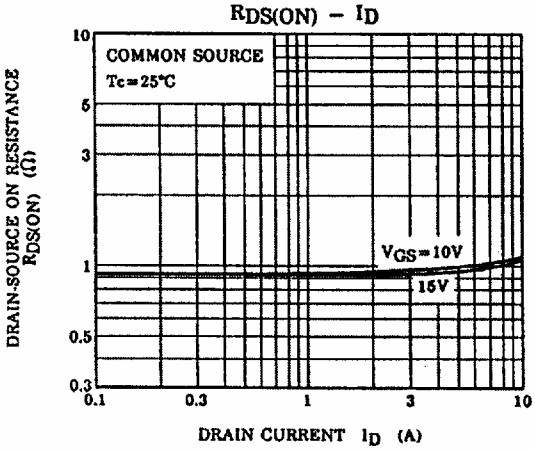
$V_{DS} - V_{GS}$



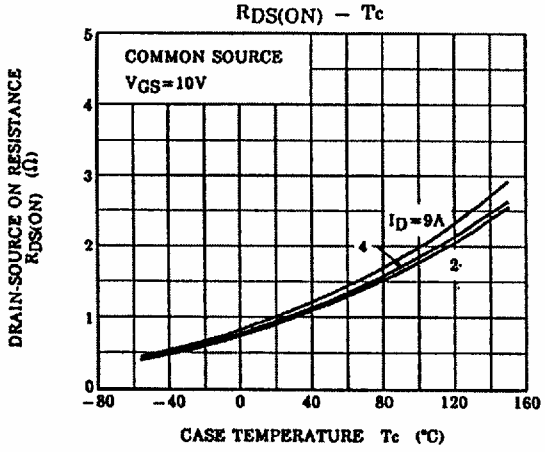
$|Y_{fs}| - I_D$



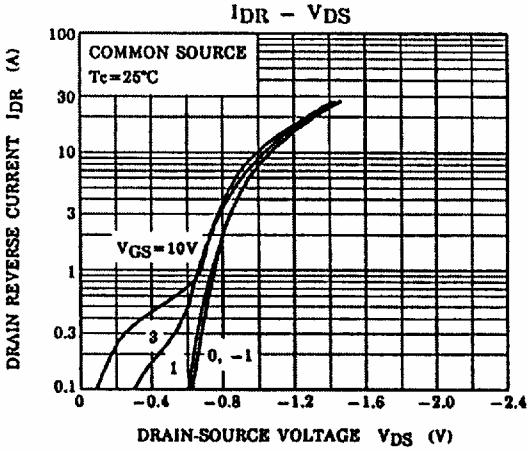
$R_{DS(ON)} - I_D$



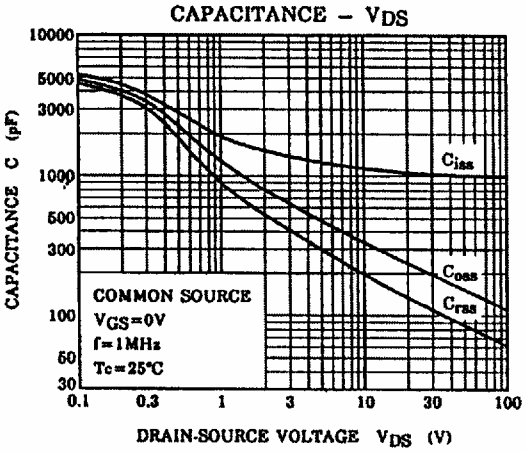
$R_{DS(ON)}$ – Tc



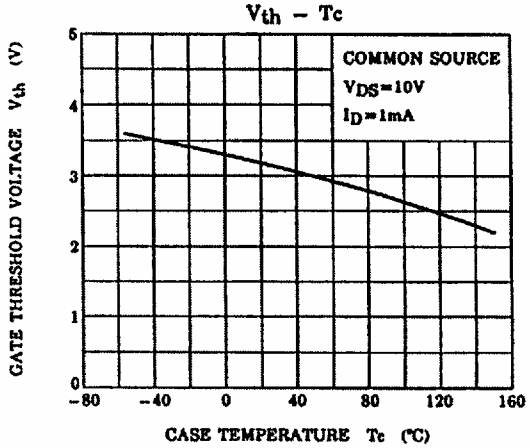
I_{DR} – V_{DS}



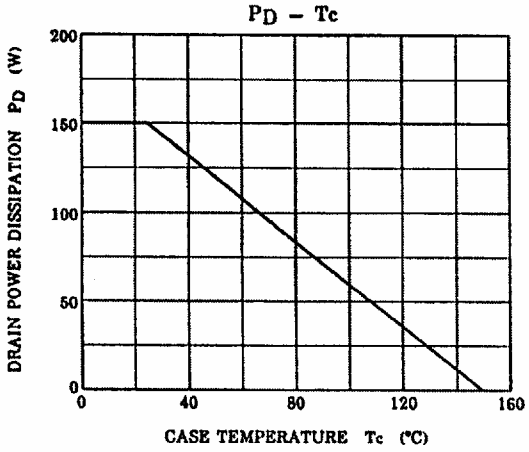
CAPACITANCE – V_{DS}



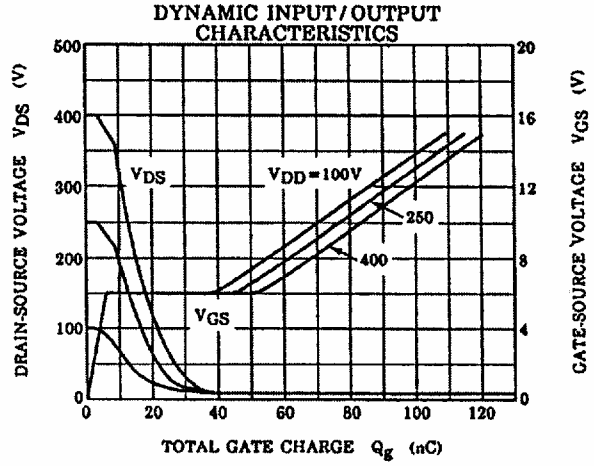
V_{th} – Tc

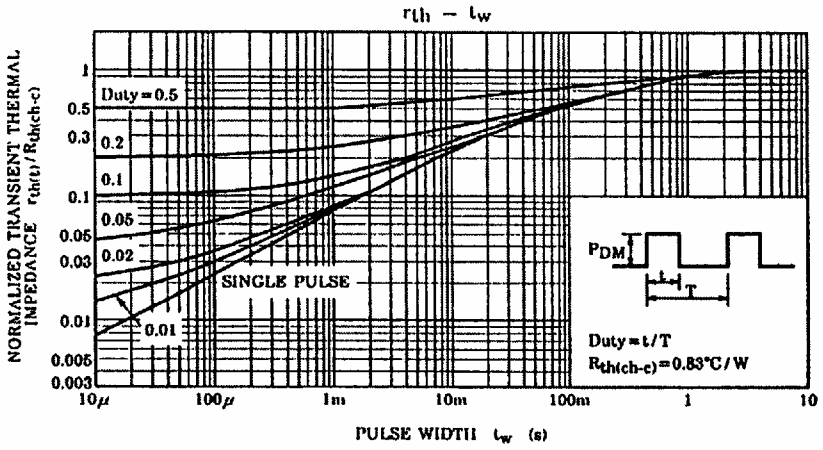


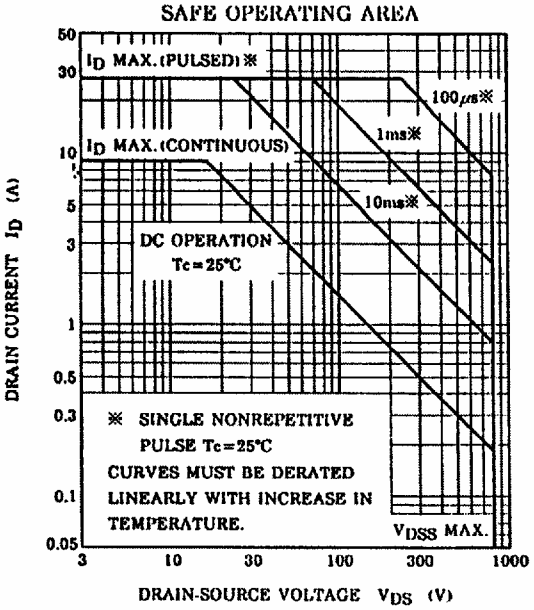
P_D – Tc



DYNAMIC INPUT / OUTPUT CHARACTERISTICS




rth – tw
NORMALIZED TRANSIENT THERMAL IMPEDANCE rth(t)/Rth(ch-c)
Duty=0.5
0.2
0.1
0.05
0.02
SINGLE PULSE
0.01
PDM
T
Duty=t/T
Rth(ch-c)=0.83°C/W
PULSE WIDTH tw (s)


SAFE OPERATING AREA
ID MAX.(PULSED)※
100μs※
1ms※
ID MAX.(CONTINUOUS)
10ms※
DC OPERATION
Tc=25°C
※ SINGLE NONREPETITIVE PULSE Tc=25°C
CURVES MUST BE DERATED LINEARLY WITH INCREASE IN TEMPERATURE.
VDSS MAX.
DRAIN CURRENT ID (A)
DRAIN-SOURCE VOLTAGE VDS (V)