

9097250 TOSHIBA (DISCRETE/OPTO)  
**TOSHIBA SEMICONDUCTOR**  
 TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR  
 2SK790 99D 16755 D  
 SILICON N CHANNEL MOS TYPE  
 (N-MOS1) T-39-13

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.  
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR  
 DRIVE APPLICATIONS.

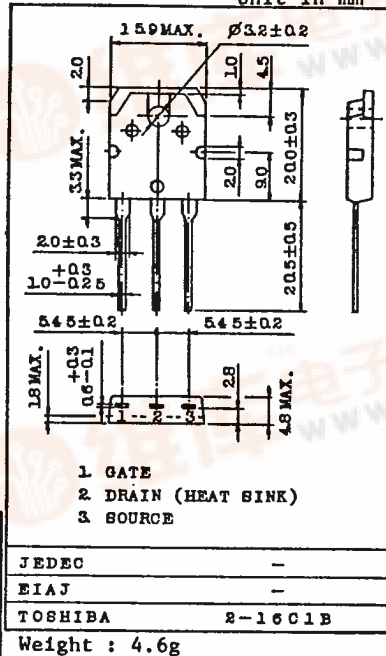
FEATURES:

- Low Drain-Source ON Resistance :  $R_{DS(ON)}=0.29\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}|=8.0S$  (Typ.)
- Low Leakage Current :  $I_{GSS}=\pm 100nA$ (Max.) @  $V_{GS}=\pm 20V$   
 $I_{DSS}=300\mu A$  (Max.) @  $V_{DS}=500V$
- Enhancement-Mode :  $V_{th}=2.0\sim 4.0V$  @  $V_{DS}=10V, I_D=1mA$

MAXIMUM RATINGS ( $T_a=25^\circ C$ )

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSX}$	500	V
Drain-Gate Voltage ( $R_{GS}=20k\Omega$ )		$V_{DGR}$	500	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	15	A
	Pulse	$I_{DP}$	60	
Drain Power Dissipation ( $T_c=25^\circ C$ )		$P_D$	150	W
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55\sim 150$	$^\circ C$

INDUSTRIAL APPLICATIONS  
 Unit in mm



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.83	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-a)}$	50	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes (1.6mm from case for 10 seconds)	$T_L$	300	$^\circ C$

TOSHIBA CORPORATION



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## ELECTRICAL CHARACTERISTICS (Ta=25°C)

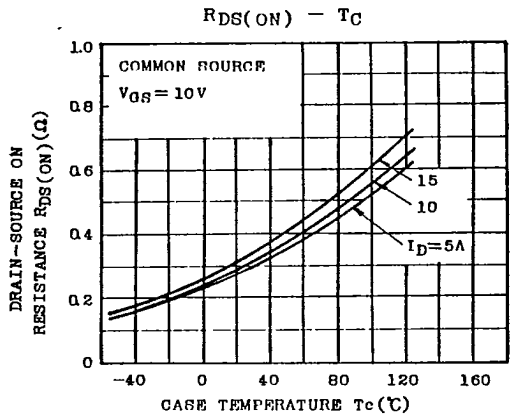
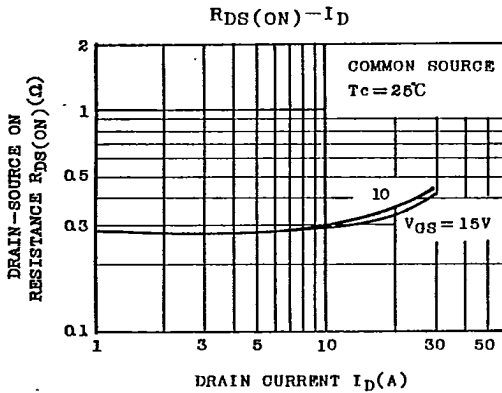
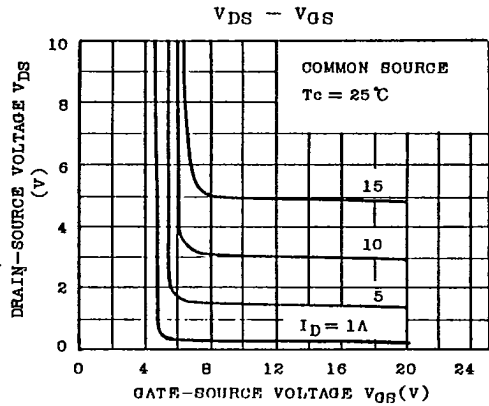
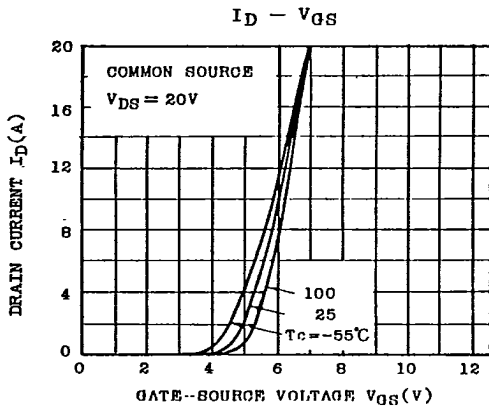
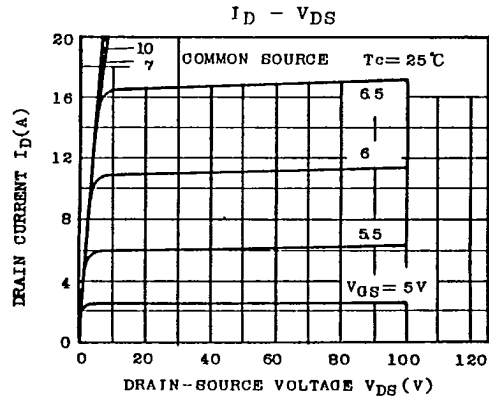
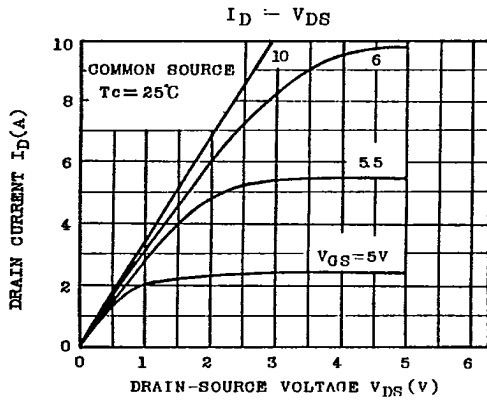
CARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	IGSS	VGS=±20V, VDS=0V	-	-	±100	nA	
Drain Cut-off Current	IDSS	VDS=500V, VGS=0V	-	-	300	µA	
Drain-Source Breakdown Voltage	V(BR)DSS	ID=10mA, VGS=0V	500	-	-	V	
Gate Threshold Voltage	Vth	VDS=10V, ID=1mA	2.0	-	4.0	V	
Forward Transfer Admittance	Yfs	VDS=10V, ID=7A	6.0	8.0	-	S	
Drain-Source ON Resistance	RDS(ON)	ID=7A, VGS=10V	-	0.29	0.40	Ω	
Input Capacitance	Ciss	VDS=10V, VGS=0V, f=1MHz	-	2300	3600	pF	
Reverse Transfer Capacitance	Crss		-	570	680		
Output Capacitance	Coss		-	1000	1400		
Switching Time	Rise Time	tr		-	70	140	ns
	Turn-on Time	ton		-	100	200	
	Fall Time	tf		-	75	150	
	Turn-off Time	toff		-	350	700	
Total Gate charge (Gate-Source Plus Gate-Drain)	Qg	ID=15A, VGS=10V	-	87	110	nC	
Gate-Source Charge	Qgs	VDD=400V	-	35	-		
Gate-Drain ("Miller") Charge	Qgd		-	52	-		

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta=25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	--	-	-	15	A
Rulse Drain Reverse Current	IDRP	--	-	-	60	A
Diode Foward Voltage	VDSF	IDR=15A, VGS=0V	-	-	2.0	V
Reverse Recovery Time	tRR	IDR=15A	-	400	-	ns
Reverse Recovered Charge	QRR	dIDR/dt=100A/µs	-	4.0	-	µC

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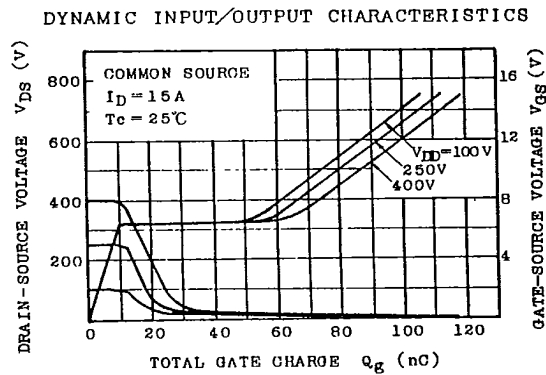
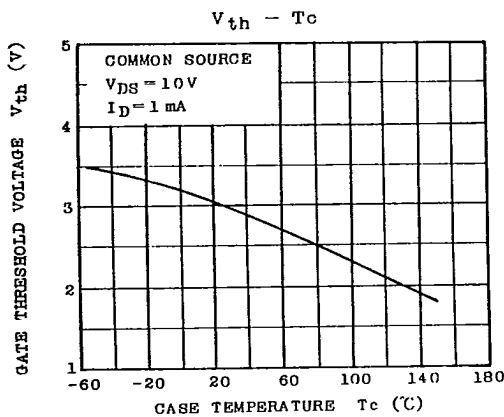
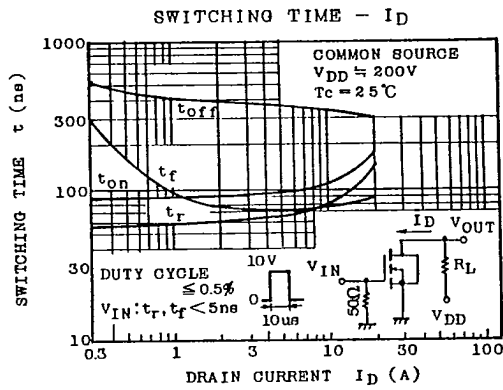
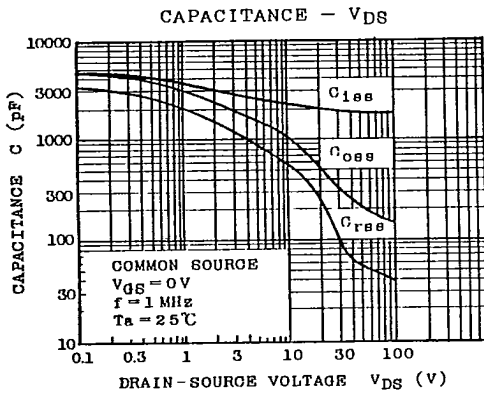
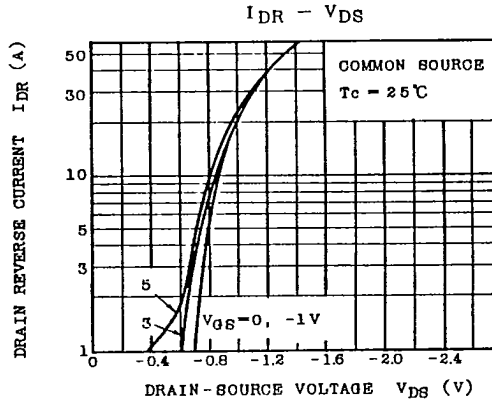
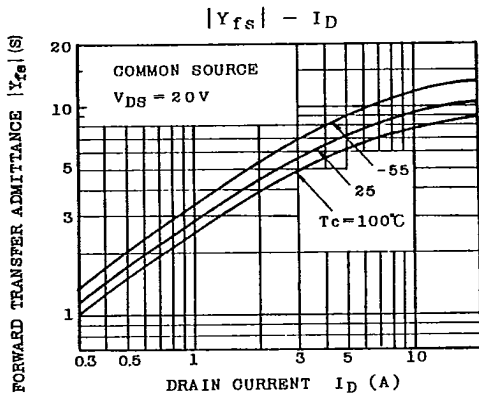


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