

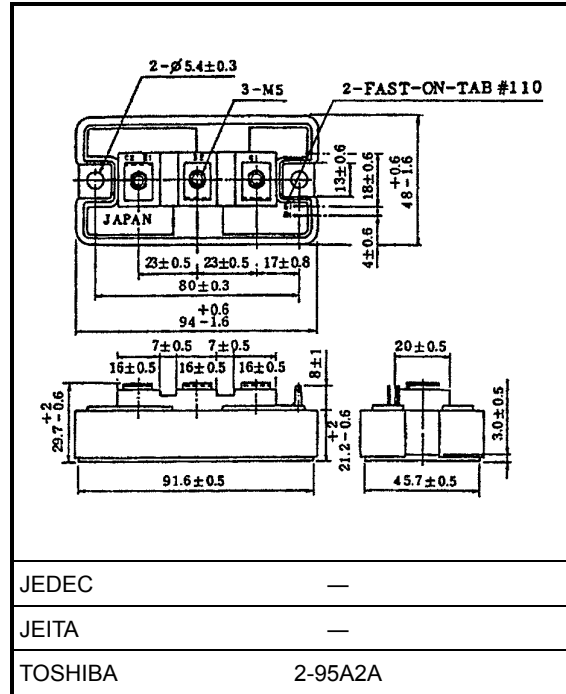
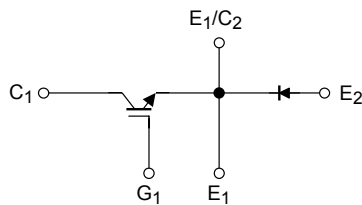
# MG150J1JS50

High Power Switching Applications  
 Motor Control Applications

Unit: mm

- The electrodes are isolated from case.
- High input impedance
- Includes a complete half bridge in one package.
- Enhancement-mode
- High speed :  $t_f = 0.30 \mu s$  (max) ( $I_C = 150 A$ )  
 $t_{rr} = 0.15 \mu s$  (max) ( $I_F = 150 A$ )
- Low saturation voltage  
 $V_{CE(sat)} = 2.70 V$  (max) ( $I_C = 150 A$ )

### Equivalent Circuit



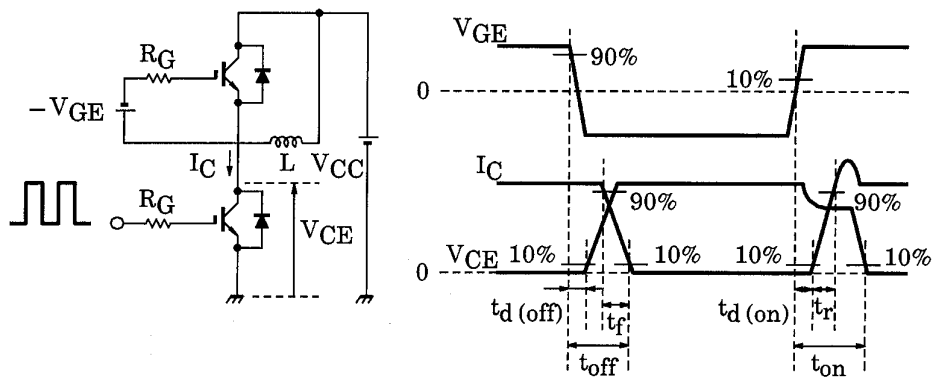
### Maximum Ratings (Ta = 25°C)

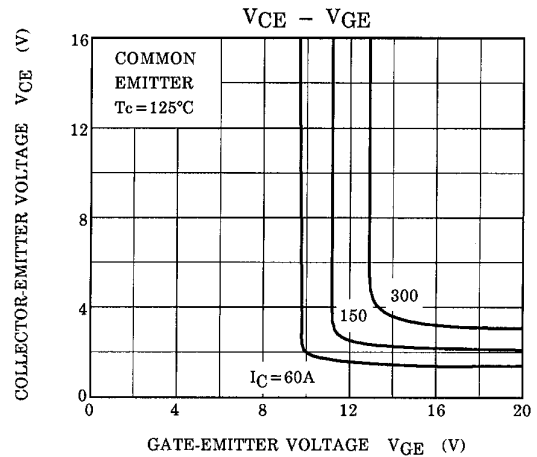
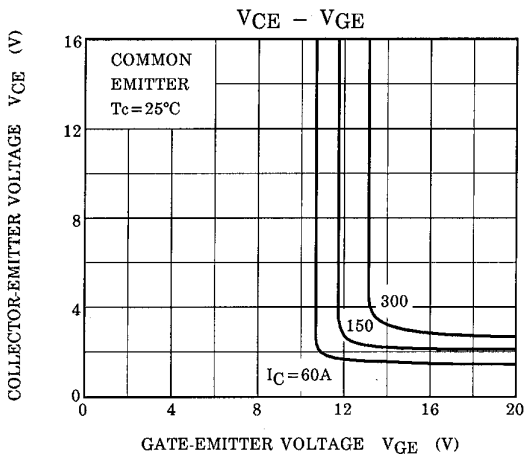
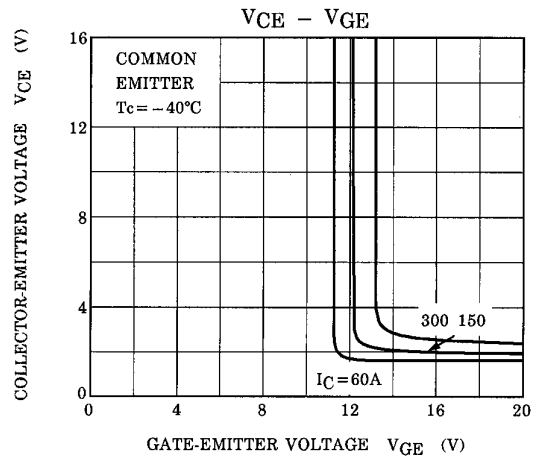
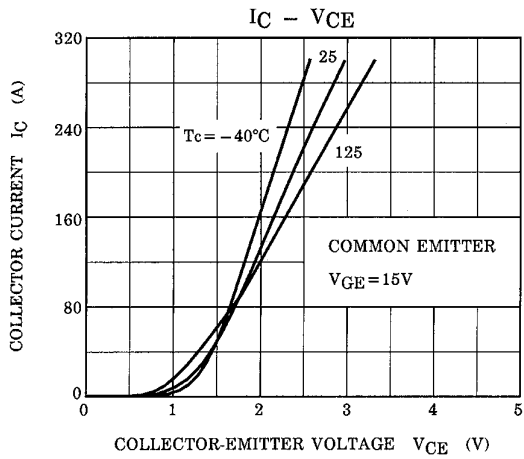
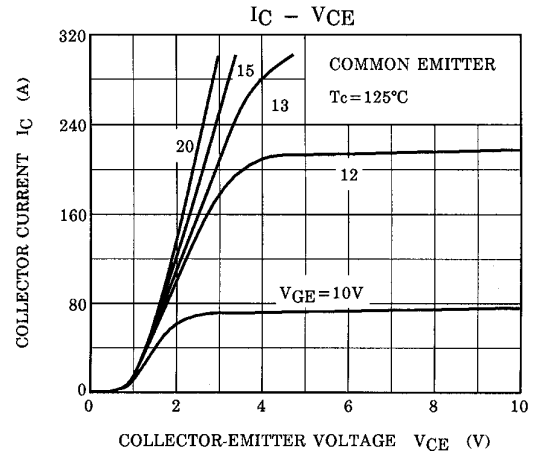
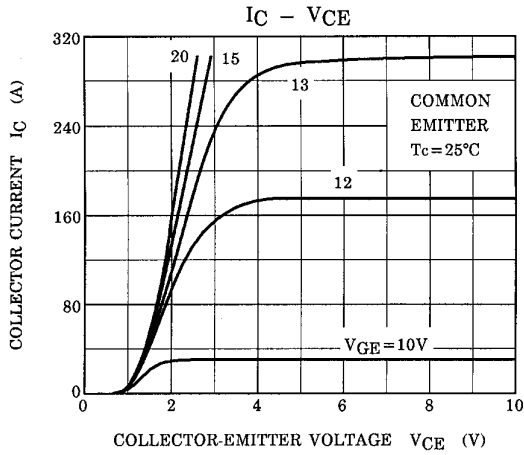
Characteristics	Symbol	Rating	Unit
Collector-emitter voltage	$V_{CES}$	600	V
Gate-emitter voltage	$V_{GES}$	±20	V
Reverse voltage	$V_R$	600	V
Collector current	DC	$I_C$	150
	1 ms	$I_{CP}$	300
Forward current	DC	$I_F$	150
	1 ms	$I_{FM}$	300
Collector power dissipation (Tc = 25°C)	$P_C$	780	W
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-40 to 125	°C
Isolation voltage	$V_{Isol}$	2500 (AC 1 min.)	V
Screw torque (Terminal/mounting)	—	3/3	N·m

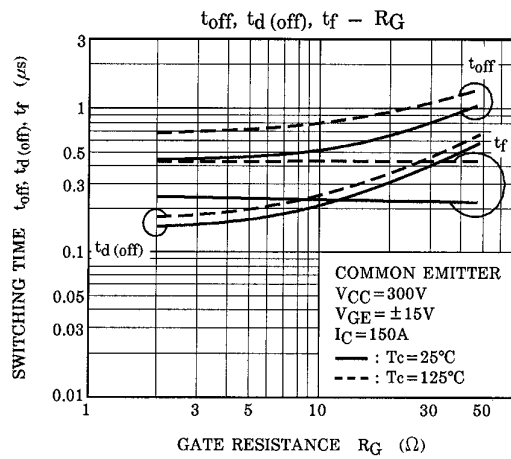
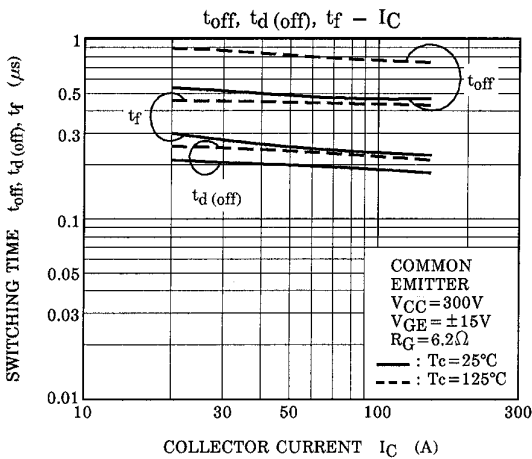
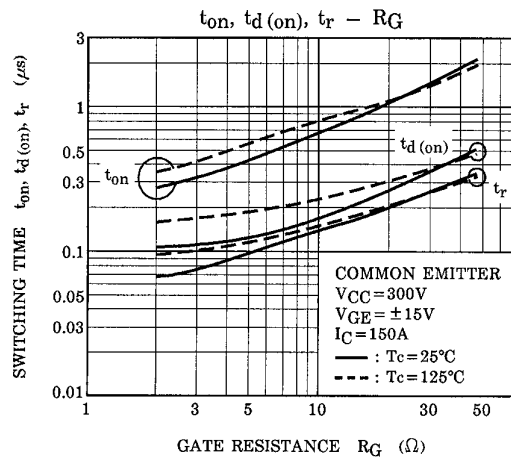
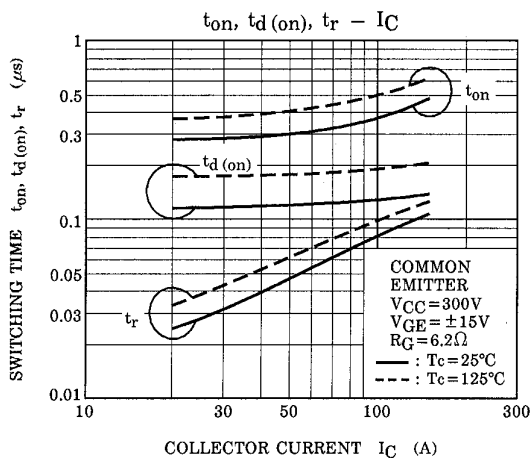
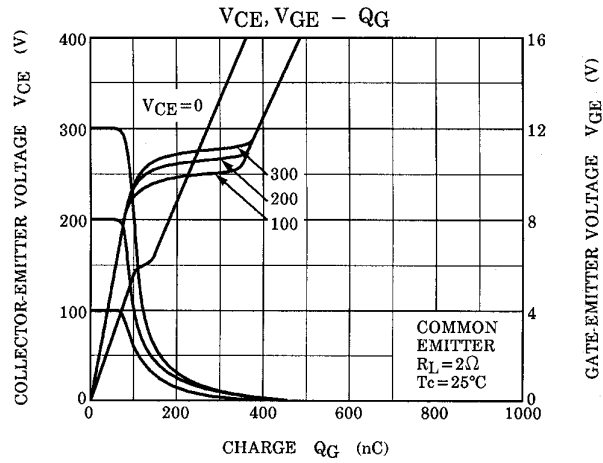
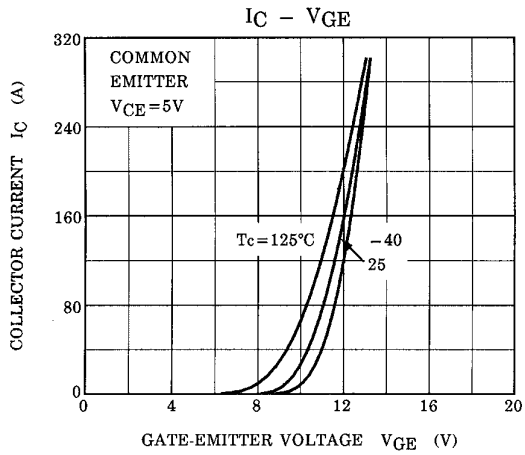
## Electrical Characteristics (Ta = 25°C)

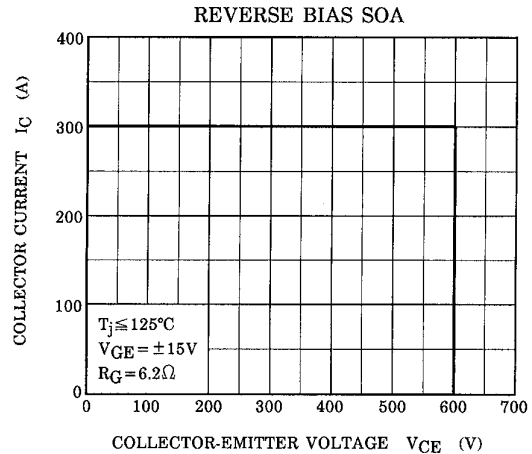
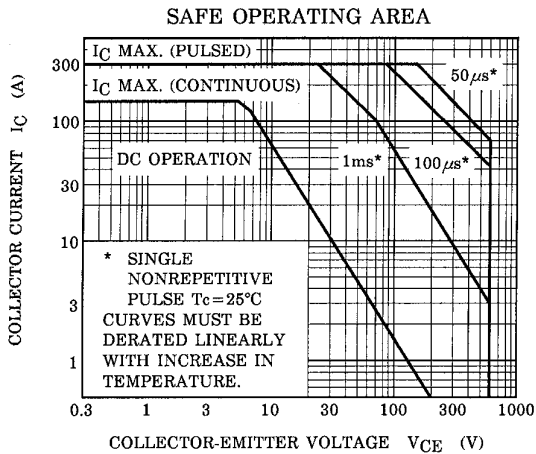
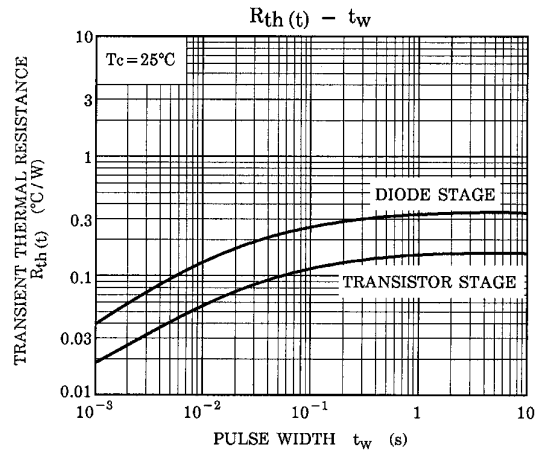
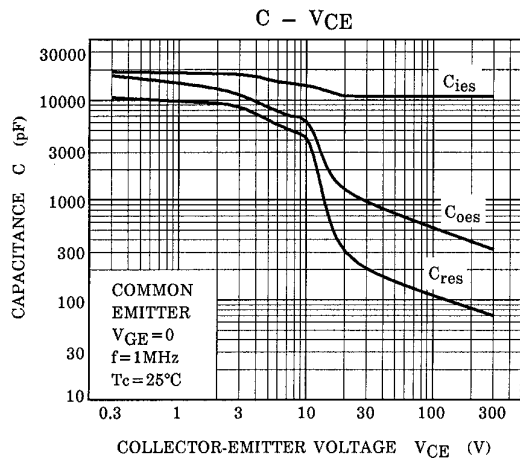
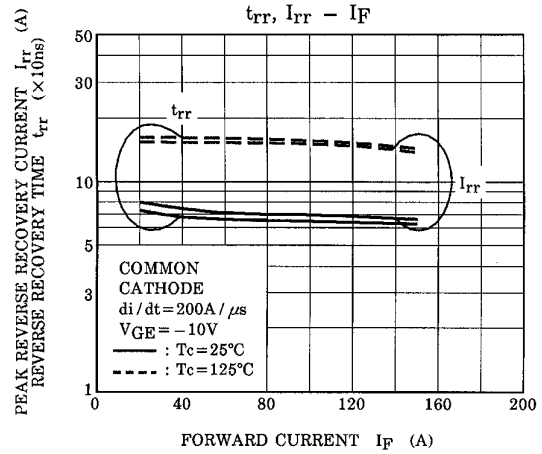
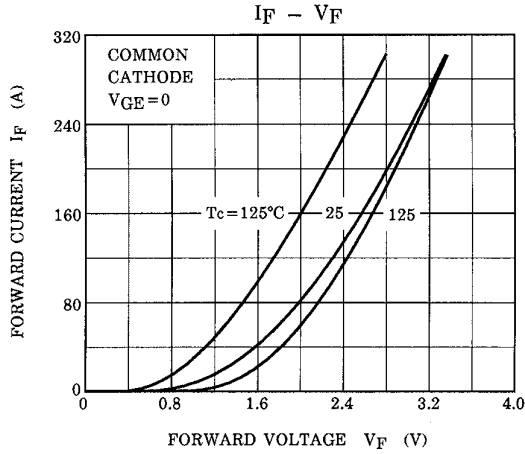
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 600 \text{ V}, V_{GE} = 0$	—	—	2.0	mA
Gate-emitter cut-off voltage		$V_{GE}(\text{off})$	$I_C = 15 \text{ mA}, V_{CE} = 5 \text{ V}$	5.0	7.0	8.0	V
Collector-emitter saturation voltage		$V_{CE}(\text{sat})$	$I_C = 150 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.10	2.70	V
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	14200	—	pF
Switching time	Turn-on delay time	$t_d(\text{on})$	Inductive load $V_{CC} = 300 \text{ V}$ $I_C = 150 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$ $R_G = 6.2 \Omega$  (Note 1)	—	0.15	0.30	$\mu\text{s}$
	Rise time	$t_r$		—	0.15	0.30	
	Turn-on time	$t_{on}$		—	0.50	1.00	
	Turn-off delay time	$t_d(\text{off})$		—	0.20	0.40	
	Fall time	$t_f$		—	0.15	0.30	
	Turn-off time	$t_{off}$		—	0.50	1.00	
Reverse current		$I_R$	$V_R = 600 \text{ V}$	—	—	1.0	mA
Forward voltage		$V_F$	$I_F = 150 \text{ A}, V_{GE} = 0$	—	2.30	3.00	V
Reverse recovery time		$t_{rr}$	$I_F = 150 \text{ A}, V_{GE} = -10 \text{ V}$ $di/dt = 200 \text{ A}/\mu\text{s}$	—	0.08	0.15	$\mu\text{s}$
Thermal resistance		$R_{th(j-c)}$	Transistor stage	—	—	0.16	$^{\circ}\text{C}/\text{W}$
			Diode stage	—	—	0.35	

Note 1: Switching time test circuit & timing chart









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