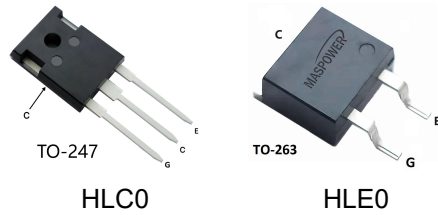


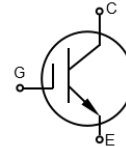
Features

- Low Gate charge
- FS Technology
- $V_{CE(sat)}$ (typ.)= 3.0V @ $I_C = 12A$
- High Input Impedance
- Short circuit withstand time 10 μs



Applications

- PFC
- UPS
- Inverter



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter voltage		V_{CES}	1700	V
Gate-emitter voltage		V_{GES}	± 30	
Collector current	$T_C = 25^\circ C$	I_C	50	A
	$T_C = 100^\circ C$		25	
Pulsed collector current(note 1)		I_{CM}	100	
Short circuit withstand time(note 2)		T_{SC}	10	μs
Short current		I_{SC}	250	A
Power dissipation	$T_C = 25^\circ C$	P_D	208	W
	$T_C = 100^\circ C$		125	
Operating Junction and storage temperature range		T_J	-55 to 150	$^\circ C$
		T_{stg}	-55 to 150	
Maximum Lead Temperature for Soldering Purposes		TL	300	$^\circ C$

Electrical Characteristics ($T_C = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 500\mu A, V_{GE} = 0V$	1700	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 250\mu A$	3.2	4.2	5.2	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 1700V, V_{GE} = 0V$	-	-	200	μA
Gate-emitter leakage current	I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0V$	-	-	± 100	nA
Collector-emitter saturation voltage(note 3)	$V_{CE(sat)}$	$I_C = 12A, V_{GE} = 15V, T_C = 25^{\circ}C$	-	3.0	3.9	V
		$I_C = 12A, V_{GE} = 15V, T_C = 150^{\circ}C$	-	3.9	-	
Dynamic and Switching Characteristics						

Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$ (note 4)	-	9670	-	pF
Reverse transfer capacitance	C_{res}		-	62	-	
Output capacitance	C_{oes}		-	196	-	
Total gate charge	Q_g	$V_{CE} = 850V, I_C = 25A,$ $V_{GE} = 15V$ (note 4)	-	210	-	nC
Gate to emitter charge	Q_{ge}		-	32	-	
Gate to collector charge	Q_{gc}		-	135	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC}=850V,$ $I_C = 25A, R_G = 10\Omega,$ Inductive Load, $T_C = 25^\circ C$	-	78	-	ns
Rise time	t_r		-	62	-	
Turn-off delay time	$t_{d(off)}$		-	160	-	
Fall time	t_f		-	88	-	
Turn-on switching energy	E_{on}		-	2.1	-	mJ
Turn-off switching energy	E_{off}		-	1.9	-	
Total switching energy	E_{ts}		-	4.0	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC}=850V,$ $I_C = 25A, R_G = 10\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	75	-	ns
Rise time	t_r		-	60	-	
Turn-off delay time	$t_{d(off)}$		-	166	-	
Fall time	t_f		-	99	-	
Turn-on switching energy	E_{on}		-	3.15	-	mJ
Turn-off switching energy	E_{off}		-	5.7	-	
Total switching energy	E_{ts}		-	8.85	-	

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: Allowed number of short circuits: <1000; time between short circuits: >1s.
- 3: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 4: Essentially independent of operating temperature

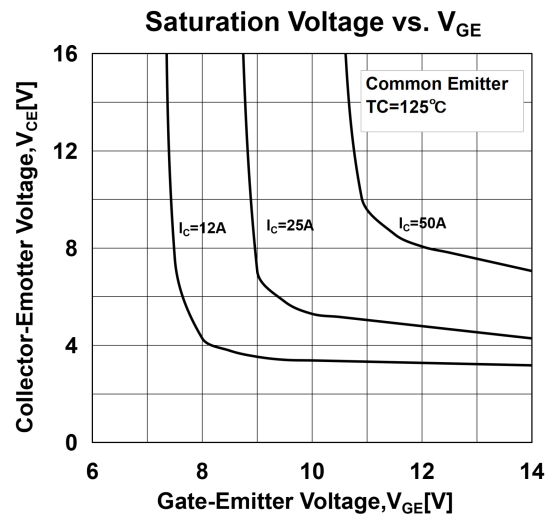
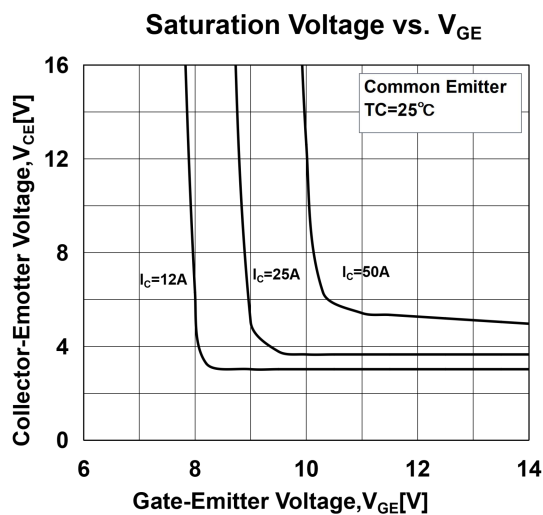
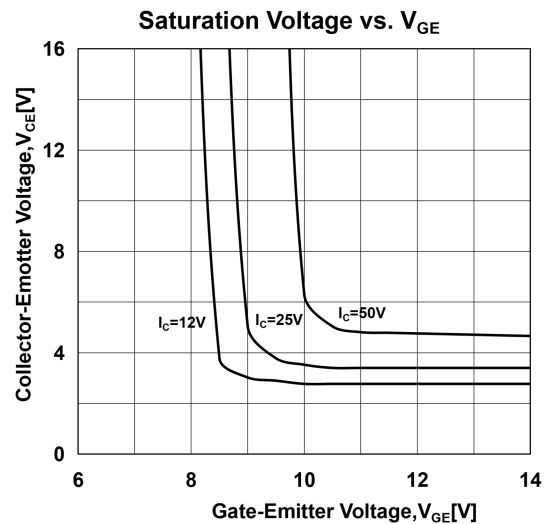
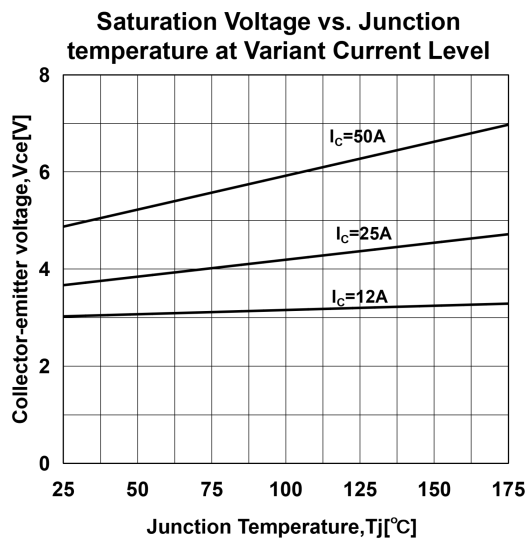
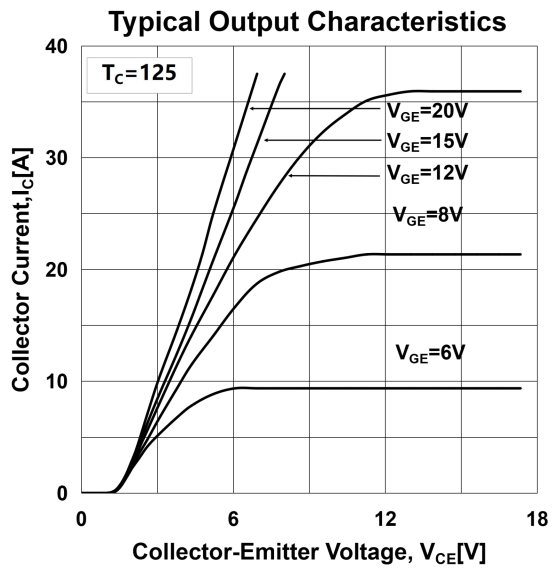
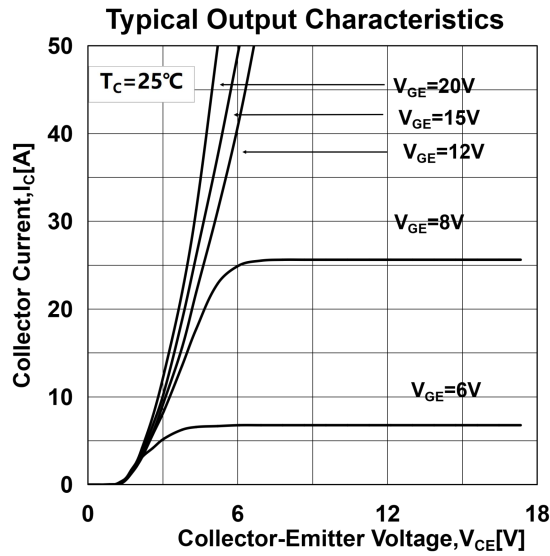
Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance junction-to-ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal resistance junction-to-case for IGBT	$R_{\theta JC}$	0.60	

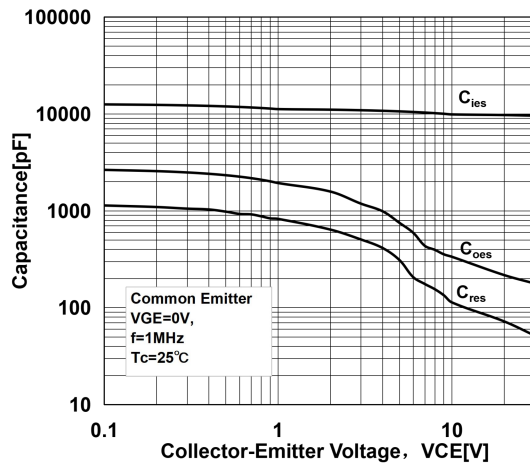
Ordering Information

Ordering Code	Silkscreen	Package
MSG25D170HLC0	MSG25D170HLC0	TO-247
MSG25D170HLE0	MSG25D170HLE0	TO-263

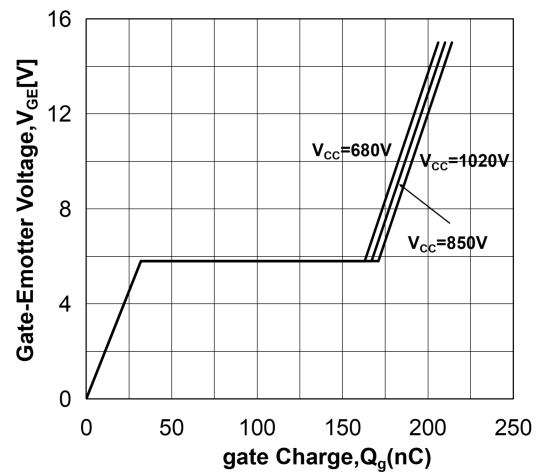
Typical Performance Characteristics



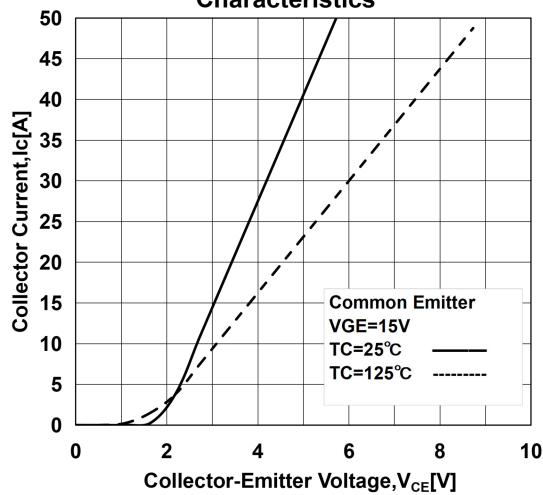
Capacitance Characteristics



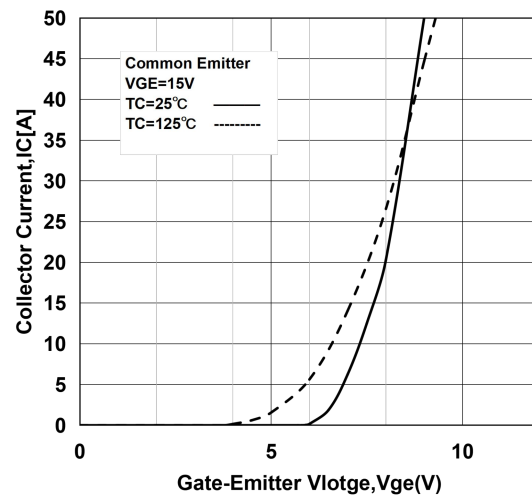
Gate Charge Characteristics



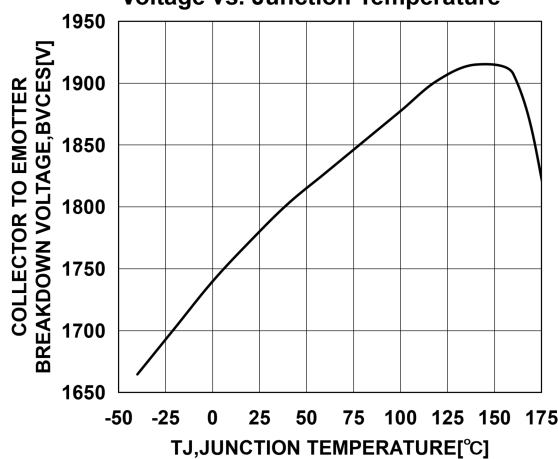
Typical Saturation Voltage Characteristics



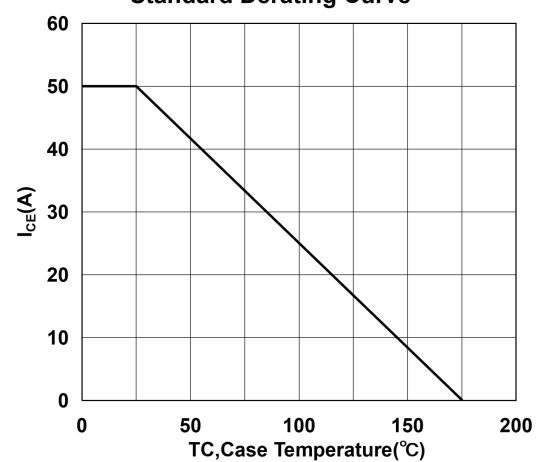
Transfer Characteristics



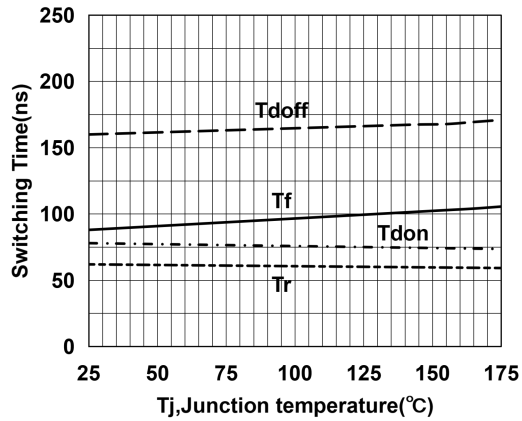
Collector to Emitter Breakdown Voltage vs. Junction Temperature



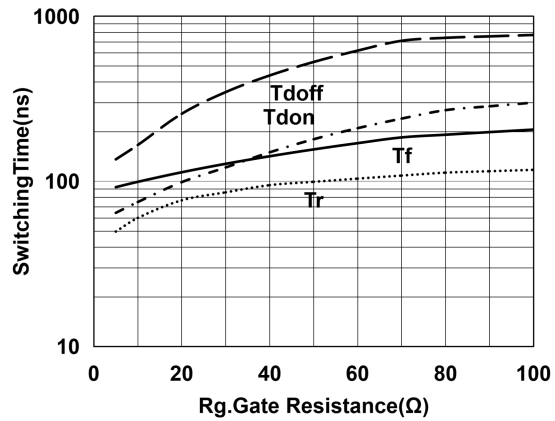
Maximum Collector-Emmitter Current Standard Derating Curve



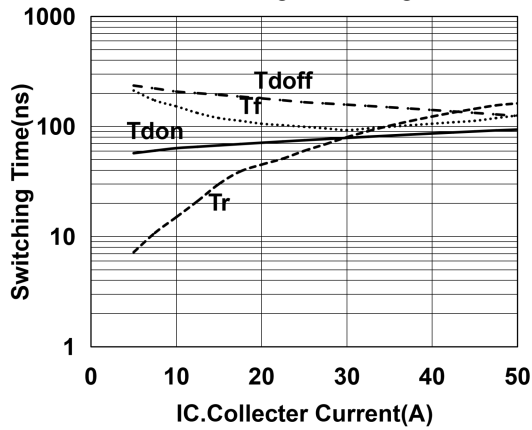
Switching Time vs. T_j
 $V_{ge}=15V, V_{ce}=850V, I_c=25A, R_g=10\Omega$



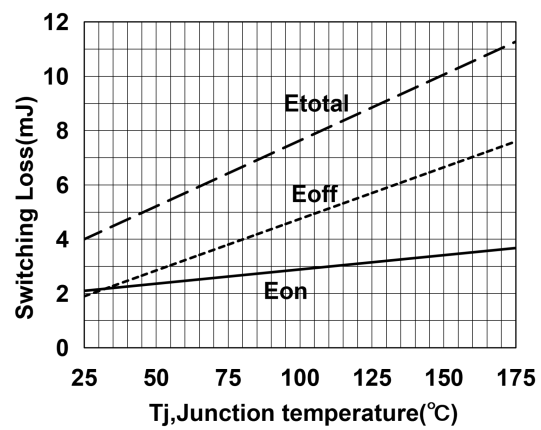
Switching Time Vs. $R_g(125^\circ C)$
 $V_{ge}=15V, V_{ce}=850V, I_c=25A$



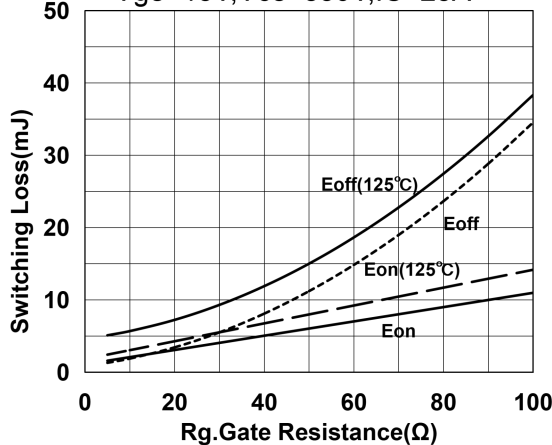
Switching Time vs. $I_c(125^\circ C)$
 $V_{ce}=850V, V_{ge}=15V, R_g=10\Omega$



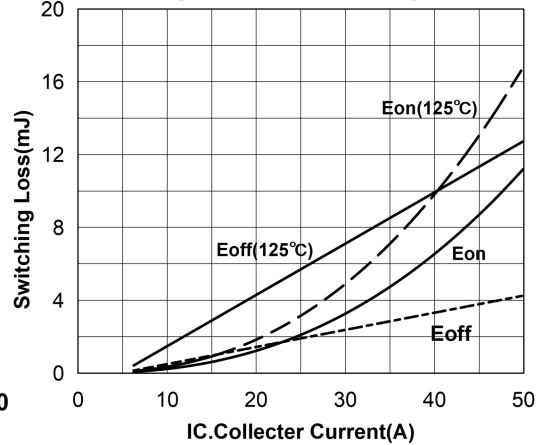
Switching Loss vs. T_j
 $V_{ge}=15V, V_{ce}=850V, I_c=25A, R_g=10\Omega$



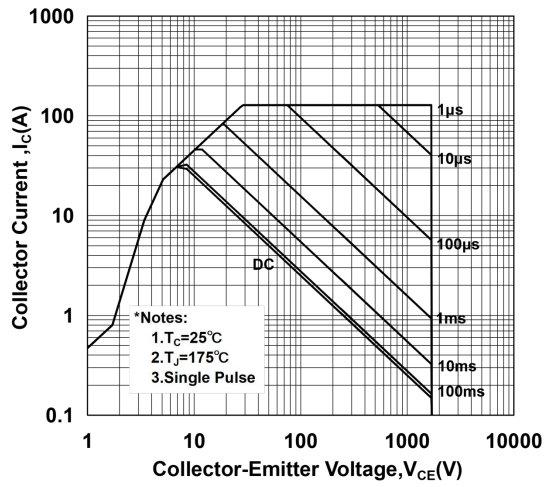
Switching Loss vs. $R_g(125^\circ C)$
 $V_{ge}=15V, V_{ce}=850V, I_c=25A$



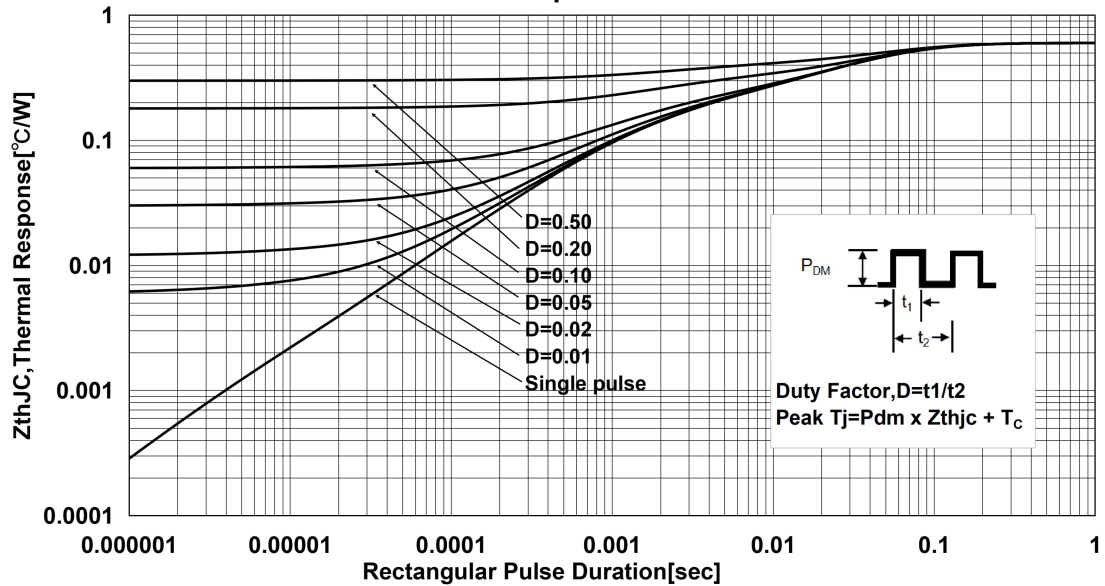
Switching Loss vs. $I_c(125^\circ C)$
 $V_{ge}=15V, V_{ce}=850V, R_g=10\Omega$



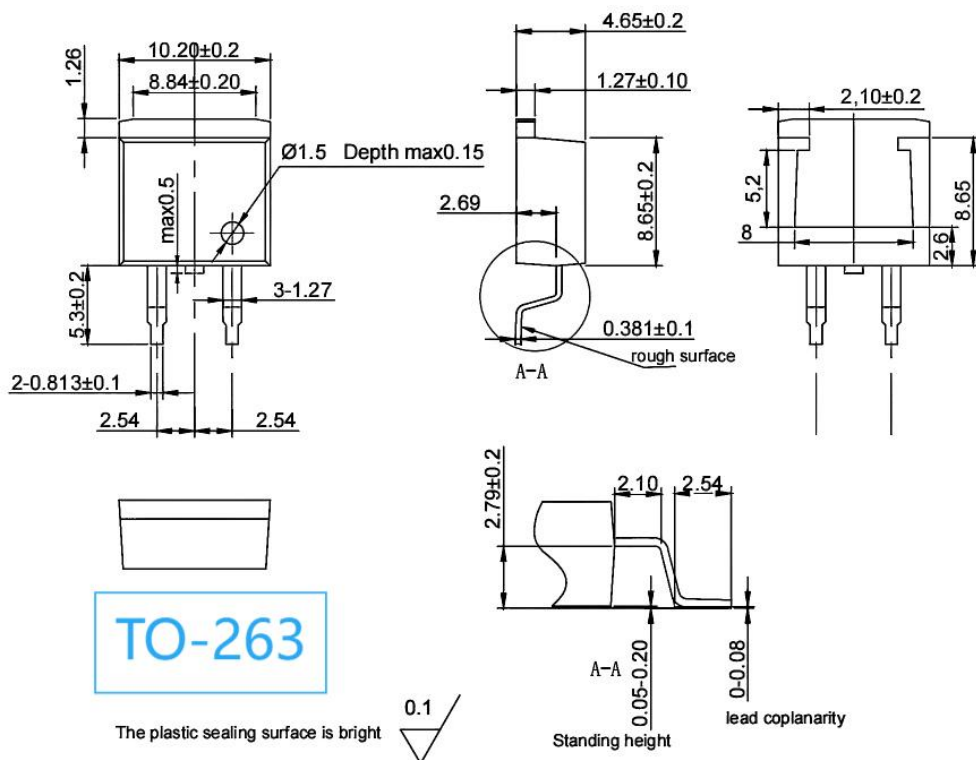
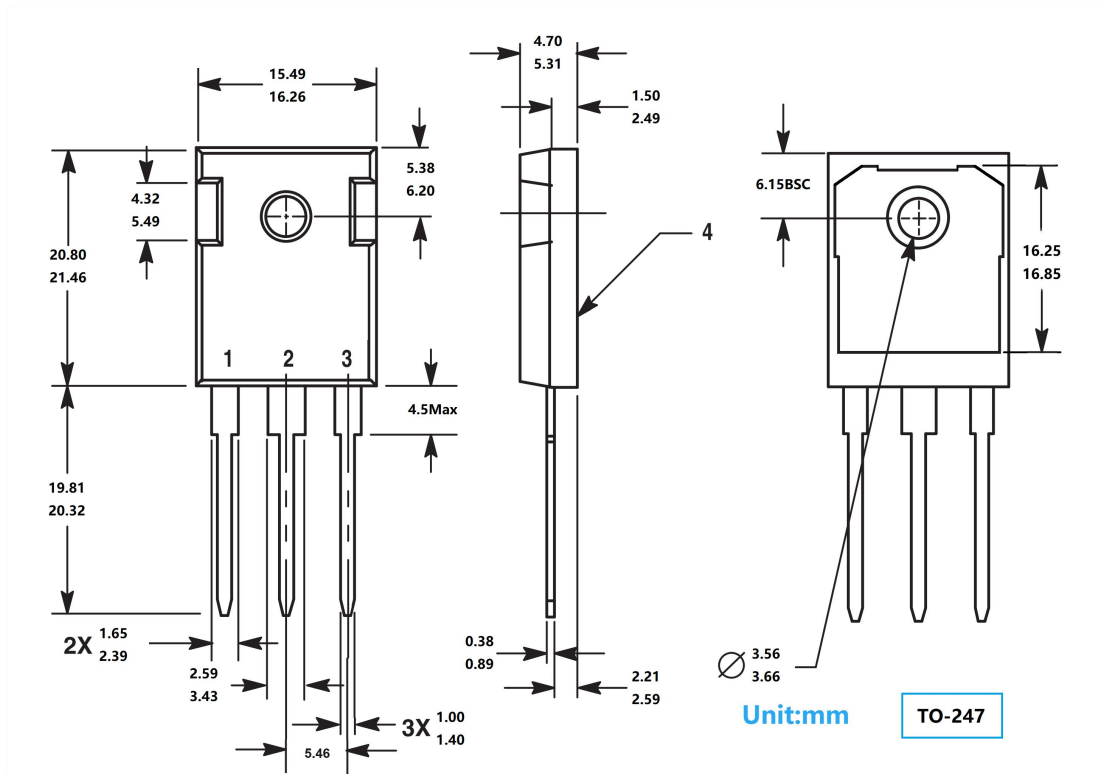
Foward Bias Safe Operating Area



Transient Thermal Impedance of IGBT



Package outline dimension



- Notes:
1. unmarked tolerance±0.15mm;unmarked R<0.15mm
 2. The resin body is not allowed to have defects, shrinkage holes, cracks, bubbles and other harmful defects
 3. The drawing indicates that the leg has reinforcement
 4. The top pinhole is not allowed to protrude the surface of the plastic sealing body
 5. Unit, mm

