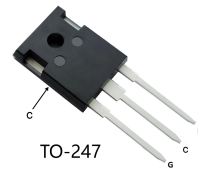
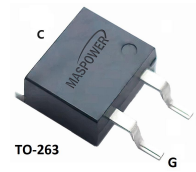


Features

- Low Gate charge
- FS Technology
- High Input Impedance
- Short circuit withstand time 10 μ s



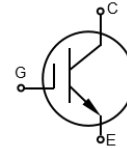
HLC0



HLE0

Applications

- Switched-Mode and Resonant-Mode Power Supplies
- Uninterruptible power supplies(UPS)
- Laser Generators
- Capacitor discharge
- AC switches



Absolute Maximum Ratings($T_C=25^{\circ}\text{C}$, unless otherwise specifies)

Parameter		Symbol	Value	Unit
Collector-Emitter voltage		V_{CES}	3000	V
Gate-emitter voltage		V_{GES}	± 30	
Collector current	$T_C=25^{\circ}\text{C}$	I_C	30	A
	$T_C=100^{\circ}\text{C}$		15	
Pulsed collector current(note1)		I_{CM}	120	
Short circuit withstand time(note2)		t_{sc}	10	μ s
Short current(note1)		I_{sc}	150	A
Power dissipation	$T_C=25^{\circ}\text{C}$	P_D	160	W
	$T_C=100^{\circ}\text{C}$		64	
Operating Junction and storage temperature rang		T_J	-55 to 150	$^{\circ}\text{C}$
		T_{stg}	-55 to 150	
Maximum Lead Temperature for Soldering Purposes		T_L	300	

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 250\mu\text{A}$, $V_{GE} = 0\text{V}$	3000	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$, $I_C = 250\mu\text{A}$	3.7	5.2	6.7	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0\text{V}$	-	-	25	μA
		$V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0\text{V}$ $T_C=100^{\circ}\text{C}$	-	-	1	mA
Gate-emitter leakage current	I_{GES}	$V_{GE} = \pm 20\text{V}$, $V_{CE} = 0\text{V}$	-	-	± 100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1\text{A}$, $V_{GE} = 15\text{V}$	-	6.0	7.8	V

(note 3)		$I_C = 5A, V_{GE} = 15V, T_C = 125^\circ C$	-	9.4	-	
Dynamic and Switching Characteristics						
Transconductance(note3)	g_{fs}	$I_C=15A, V_{CE}=10V$	6.5	10.8	-	S
Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$	-	1300	-	pF
Output capacitance	C_{oes}		-	60	-	
Reverse transfer capacitance	C_{res}		-	23	-	
Total gate charge	Q_g	$V_{CE} = 1000V, I_C = 15A,$ $V_{GE} = 15V$	-	56	-	nC
Gate to emitter charge	Q_{ge}		-	15	-	
Gate to collector charge	Q_{gc}		-	10	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 1250V,$ $I_C = 15A, R_G = 10\Omega,$ Inductive Load, $T_C = 25^\circ C$	-	63	-	ns
Rise time	t_r		-	138	-	
Turn-off delay time	$t_{d(off)}$		-	176	-	
Fall time	t_f		-	535	-	
Turn-on switching energy	E_{on}		-	2.4	-	mJ
Turn-off switching energy	E_{off}		-	4.5	-	
Total switching energy	E_{ts}		-	6.9	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 1250V,$ $I_C = 15A, R_G = 10\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	60	-	ns
Rise time	t_r		-	134	-	
Turn-off delay time	$t_{d(off)}$		-	183	-	
Fall time	t_f		-	605	-	
Turn-on switching energy	E_{on}		-	3.6	-	mJ
Turn-off switching energy	E_{off}		-	13.5	-	
Total switching energy	E_{ts}		-	17.1	-	

Thermal Characteristics

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

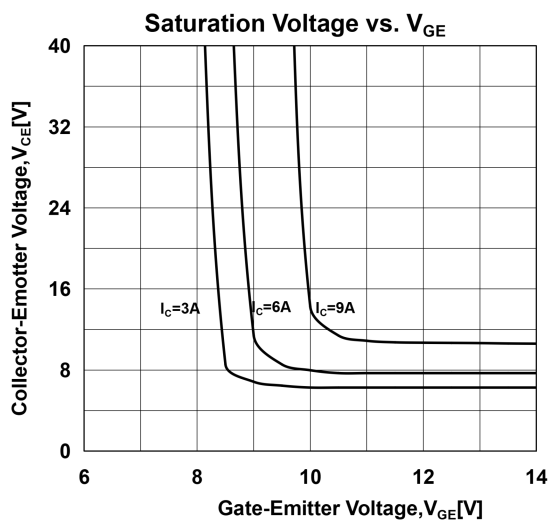
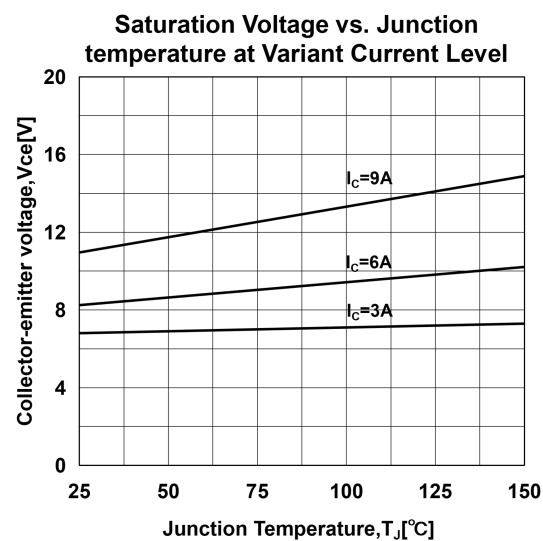
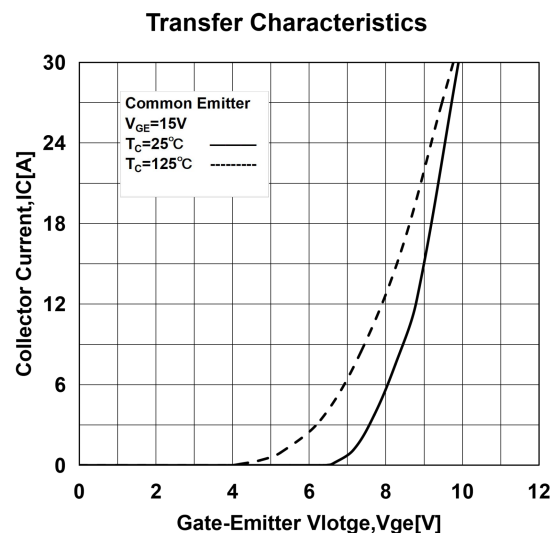
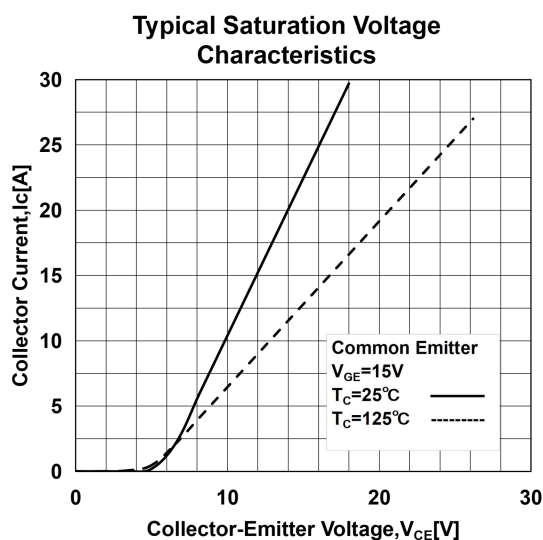
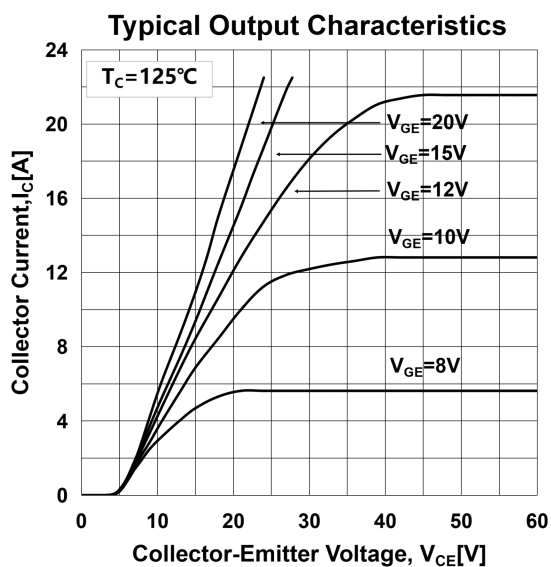
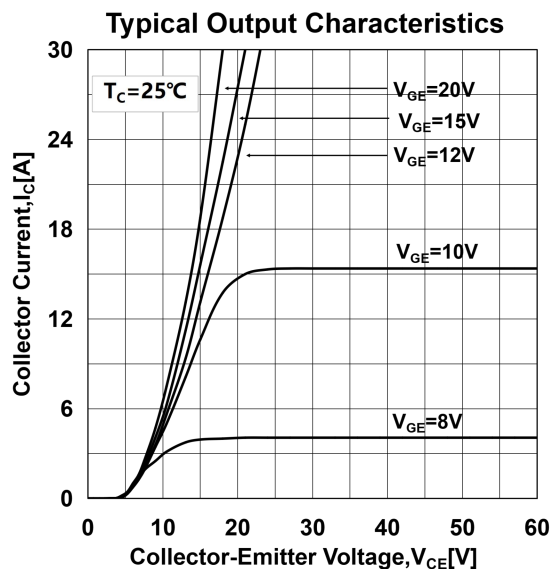
Ordering information

Order Code	Silkscreen	package
MSG15D300HLC0	MSG15D300HLC0	TO-247
MSG15D300HLE0	MSG15D300HLE0	TO-263

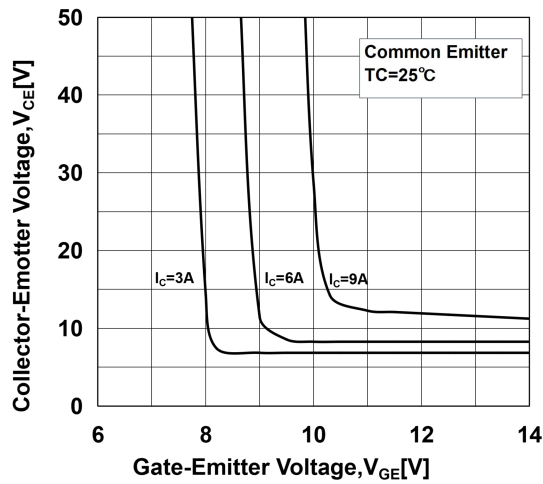
Notes:

- 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 Cycles $\leq 2\%$
- 4: Essentially independent of operating temperature

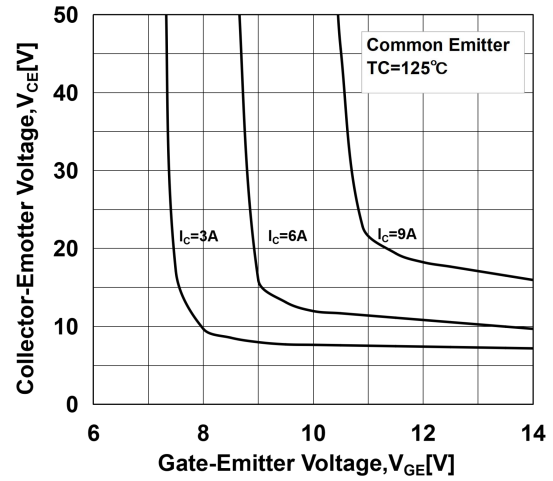
Typical Performance Characteristic



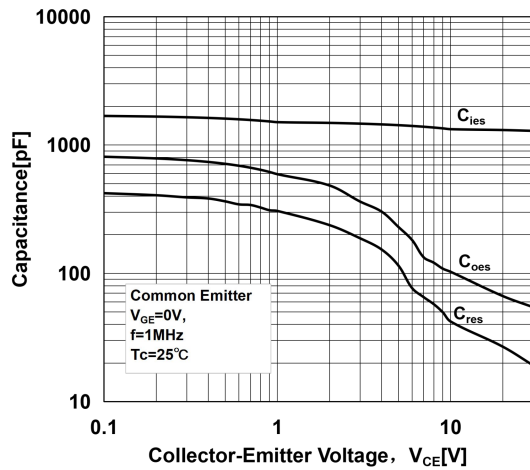
Saturation Voltage vs. V_{GE}



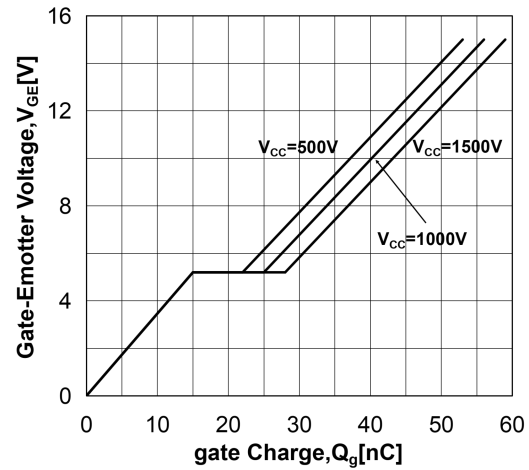
Saturation Voltage vs. V_{GE}



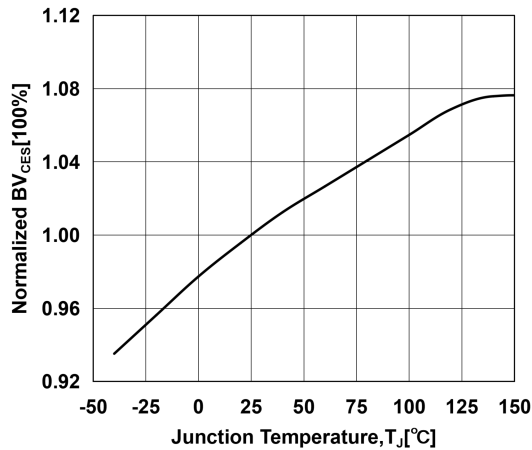
Capacitance Characteristics



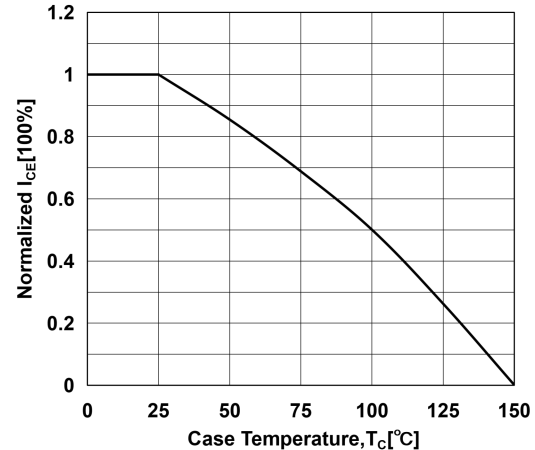
Gate Charge Characteristics

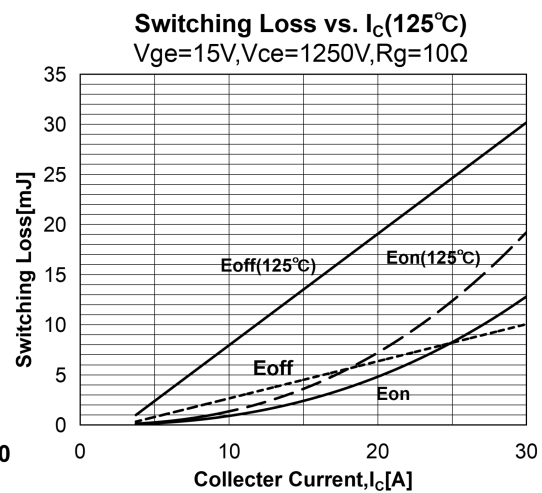
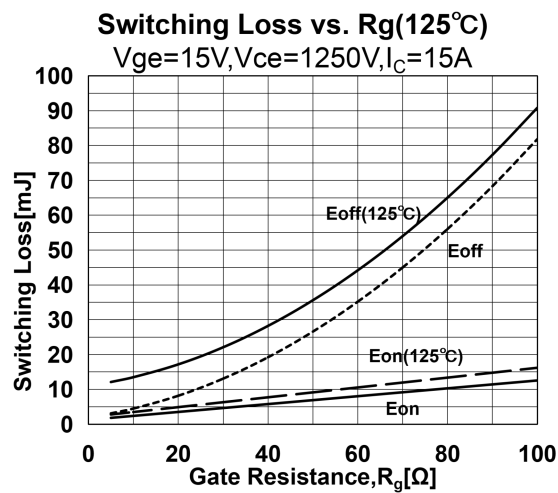
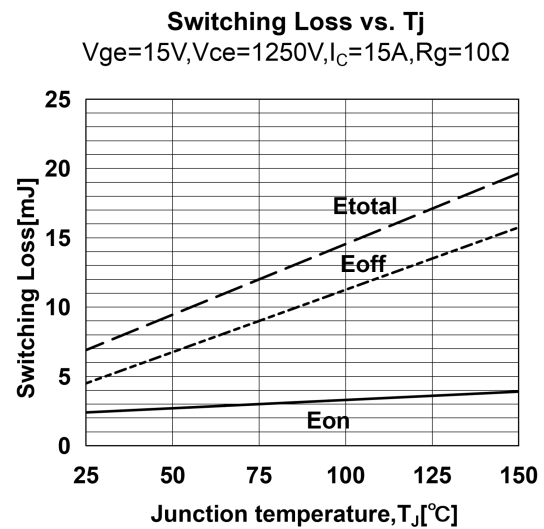
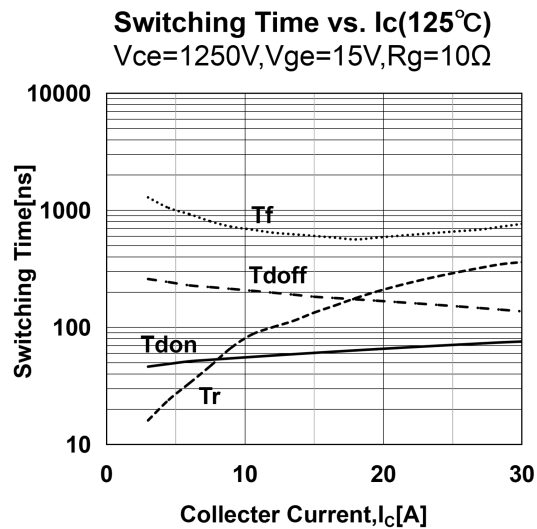
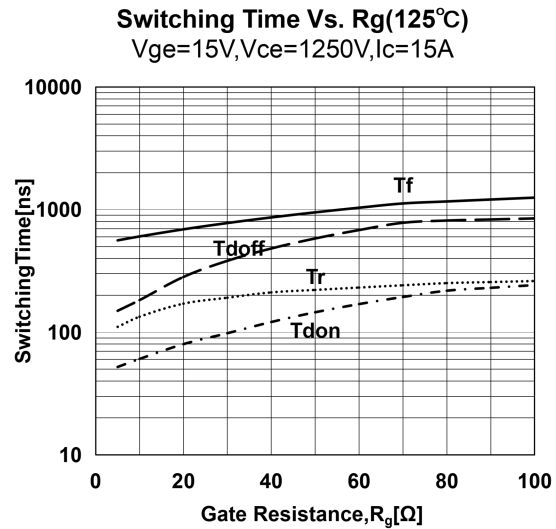
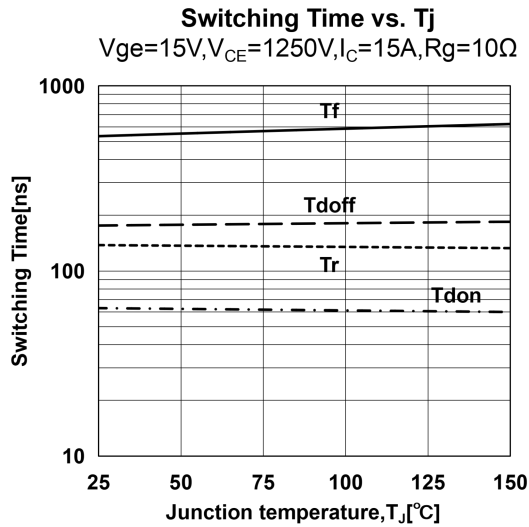


Normalized Collector to Emitter Breakdown Voltage vs. Junction Temperature

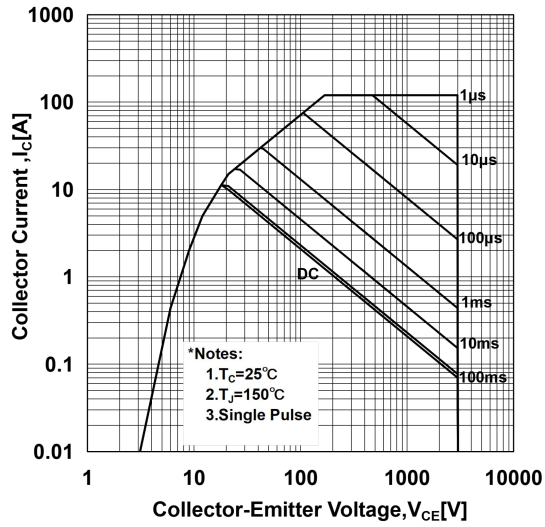


Normalized Collector-Emitter Current Standard Derating Curve

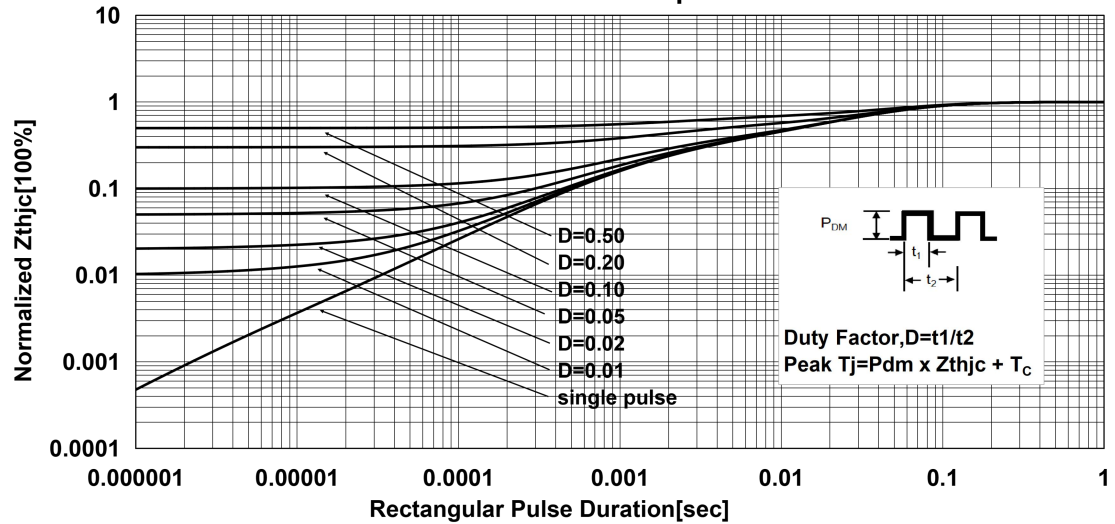




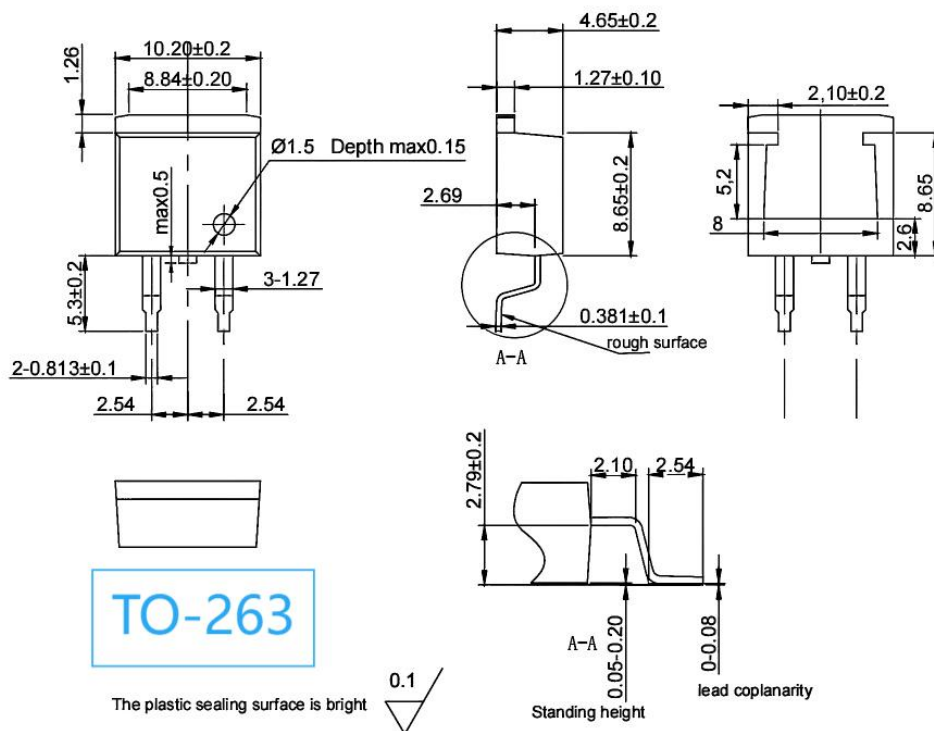
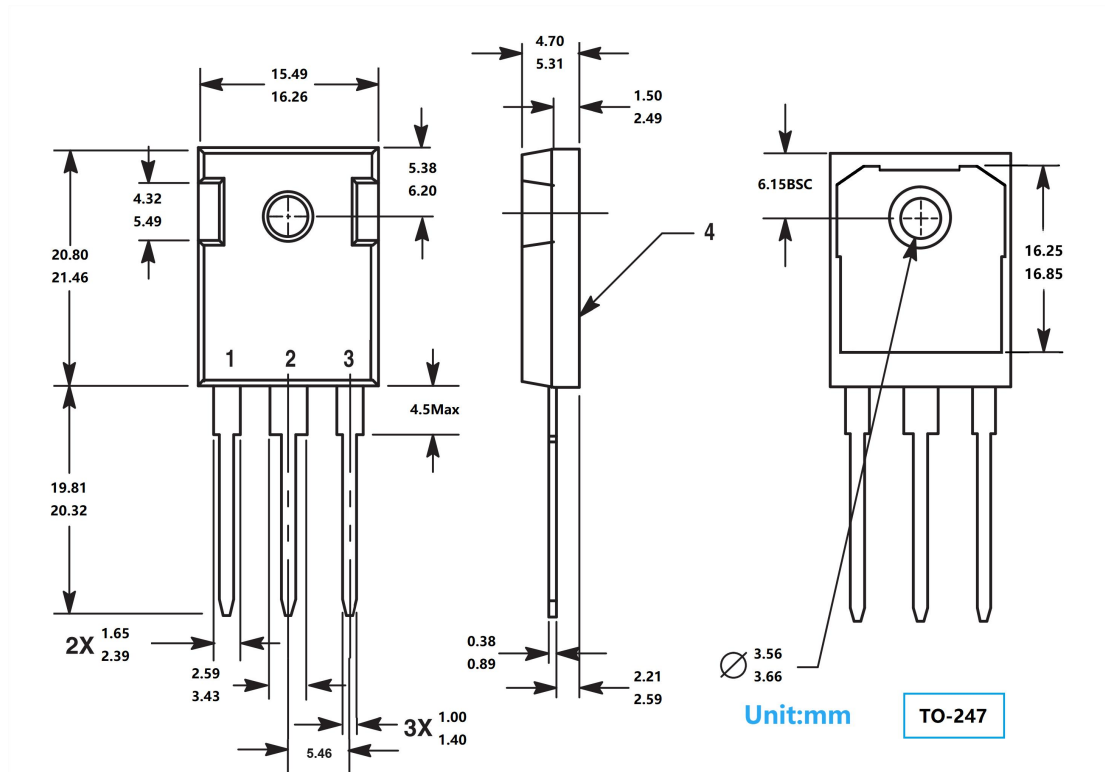
Forward Bias Safe Operating Area



Normalized 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