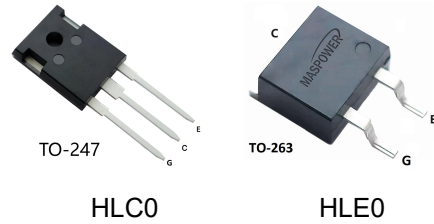


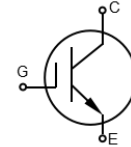
Features

- Low Gate charge
- FS Technology
- $V_{CE(sat)} (typ.) = 2.9V @ I_C = 2A$
- 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}	3500	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}	200	A
Power dissipation	$T_C = 25^\circ C$	P_D	312	W
	$T_C = 100^\circ C$		125	
Operating Junction and storage temperature rang		T_J	-55 to 150	$^\circ C$
		T_{stg}	-55 to 150	
Maximum Lead Temperature for Soldering Purposes		T_L	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}	$I_C = 250\mu A, V_{GE} = 0V$	3500	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 250\mu A$	4.0	5.2	6.0	
Zero gate voltage collector current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	100	μA
		$V_{CE} = V_{CES}, V_{GE} = 0V, T_C = 125^\circ C$	-	-	10	mA
Gate-emitter leakage current	I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0V$	-	-	± 100	nA
Collector-emitter saturation voltage (note 3)	$V_{CE(sat)}$	$I_C = 2A, V_{GE} = 10V, T_C = 25^\circ C$	-	2.9	4.3	V
		$I_C = 2A, V_{GE} = 10V, T_C = 125^\circ C$	-	3.5	-	

Dynamic and Switching Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$ (note 4)	-	2870	-	pF
Reverse transfer capacitance	C_{res}		-	115	-	
Output capacitance	C_{oes}		-	60	-	
Total gate charge	Q_g Q_{GS} Q_{GC}	$V_{CE} = 1250V, I_C = 25A,$ $V_{GE} = 15V$ (note 4)	-	115 25 46	-	nC
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 1500V,$ $I_C = 25A, R_G = 4.7\Omega,$ Inductive Load, $T_C = 25^\circ C$	-	52	-	ns
Rise time	t_r		-	300	-	
Turn-off delay time	$t_{d(off)}$		-	170	-	
Fall time	t_f		-	610	-	
Turn-on switching energy	E_{on}	$V_{GE} = 15V, V_{CC} = 1250V,$ $I_C = 25A, R_G = 4.7\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	3.8	-	mJ
Turn-off switching energy	E_{off}		-	5.1	-	
Total switching energy	E_{ts}		-	8.9	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 1250V,$ $I_C = 25A, R_G = 4.7\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	50	-	ns
Rise time	t_r		-	291	-	
Turn-off delay time	$t_{d(off)}$		-	175	-	
Fall time	t_f		-	689	-	
Turn-on switching energy	E_{on}	$V_{GE} = 15V, V_{CC} = 1250V,$ $I_C = 25A, R_G = 4.7\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	5.7	-	mJ
Turn-off switching energy	E_{off}		-	15.3	-	
Total switching energy	E_{ts}		-	21.0	-	

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	$R_{\theta JC}$	0.40	

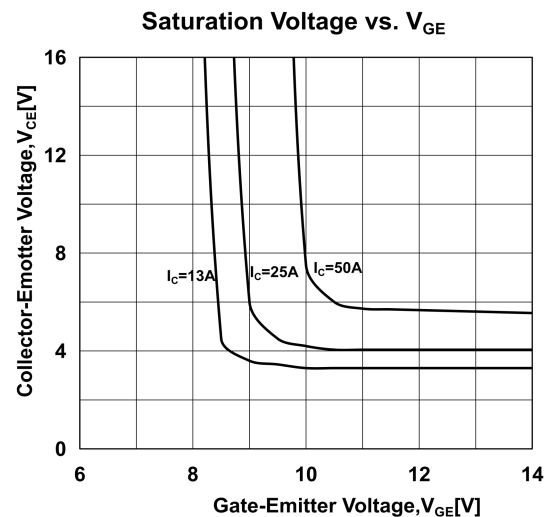
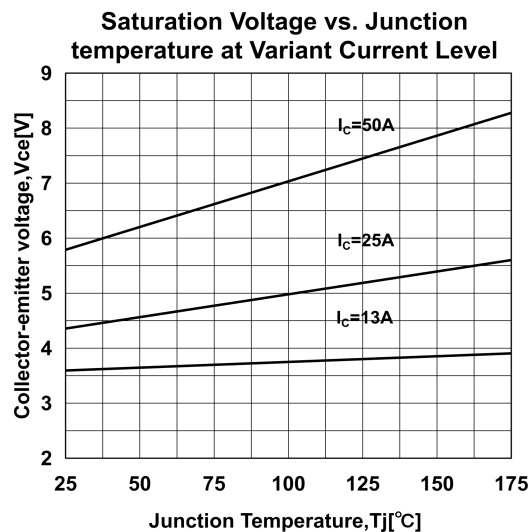
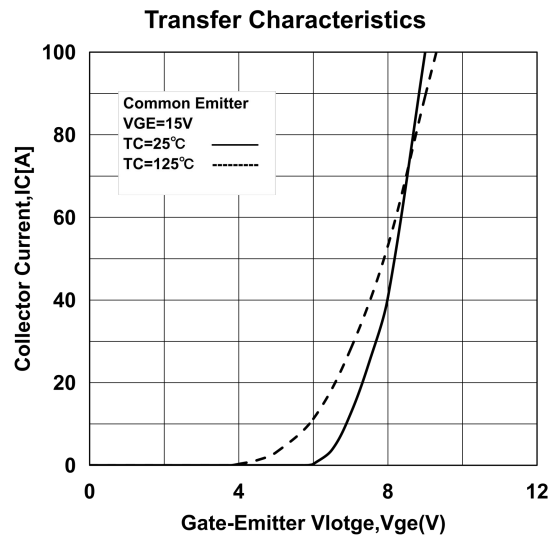
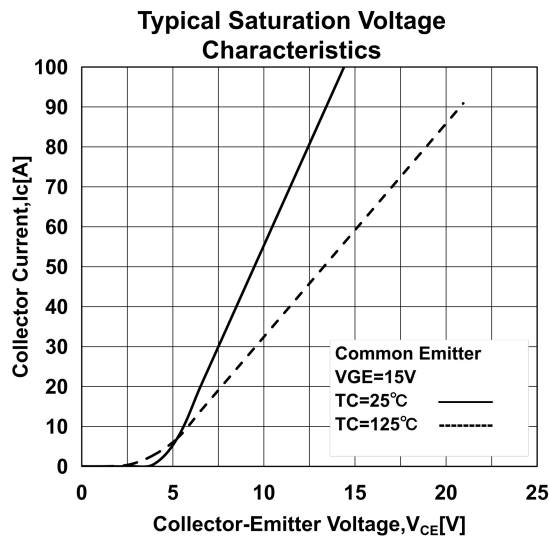
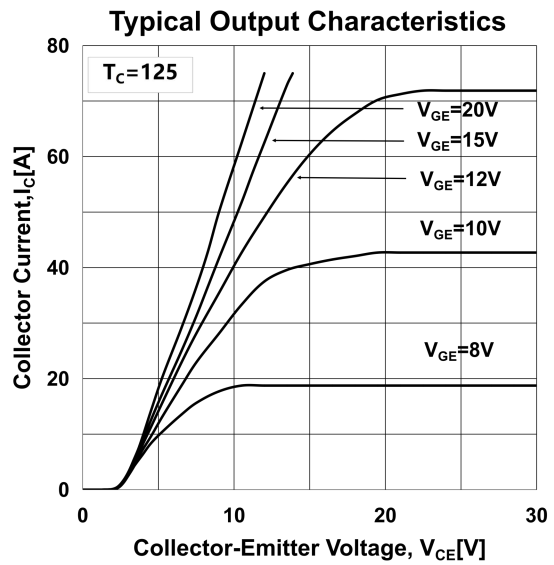
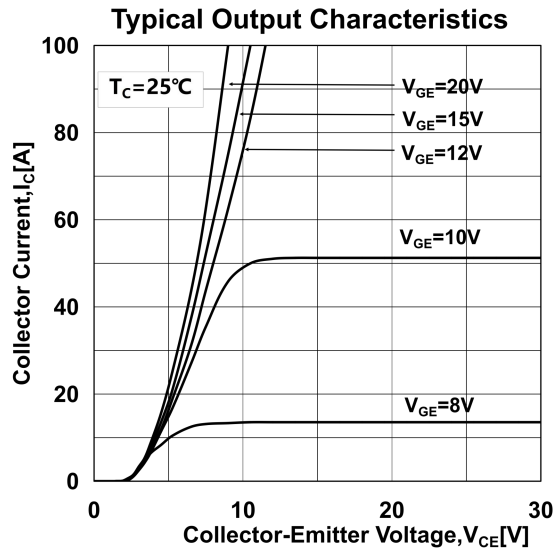
Ordering information

Order codes	Silkscreen	Package
MSG25D350HLE0	MSG25D350HLE0	TO-263
MSG25D350HLC0	MSG25D350HLC0	TO-247

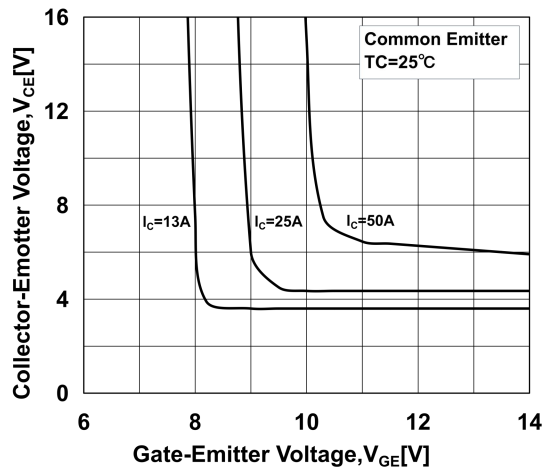
Notes:

- 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

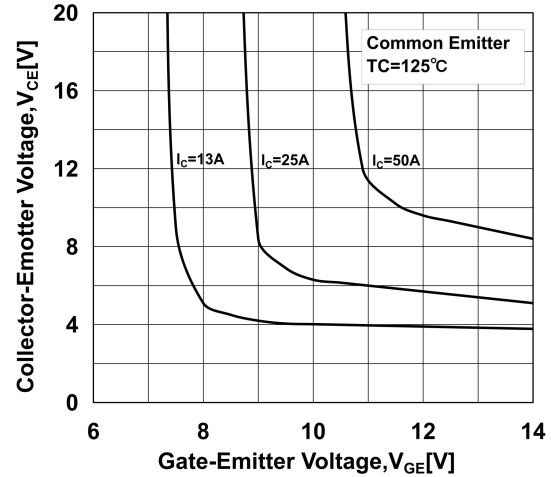
Typical Performance Characteristic



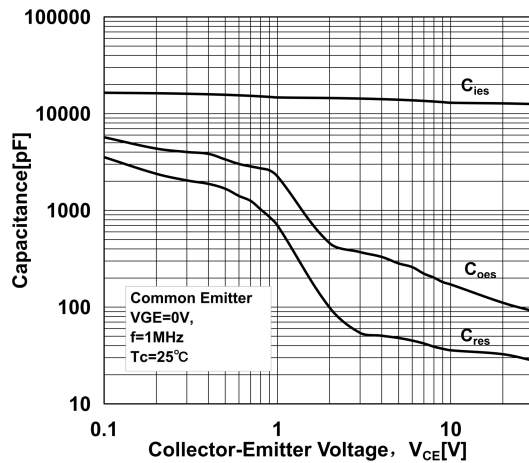
Saturation Voltage vs. V_{GE}



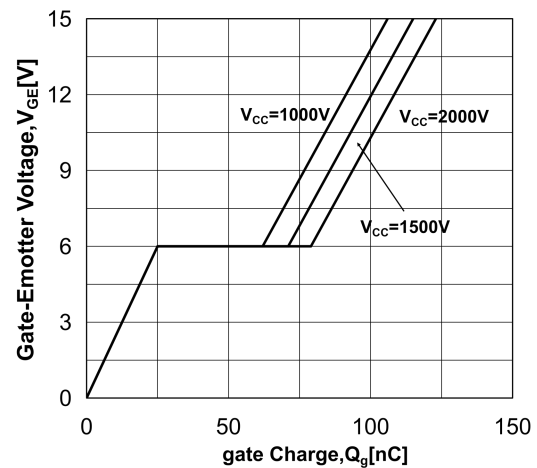
Saturation Voltage vs. V_{GE}



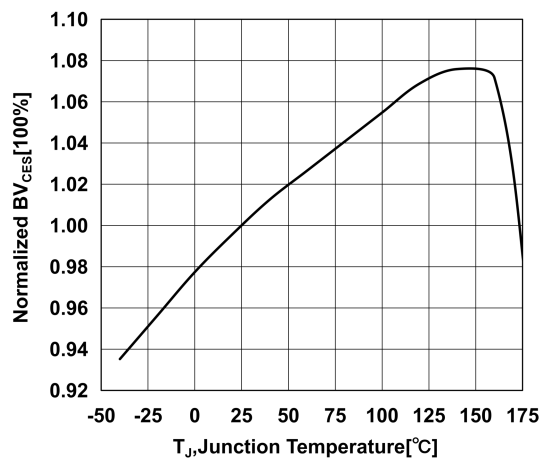
Capacitance Characteristics



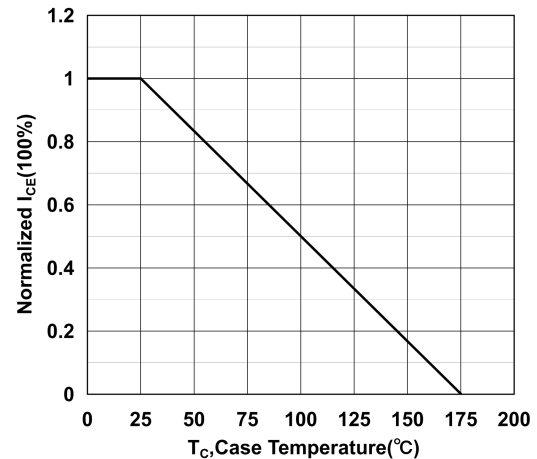
Gate Charge Characteristics

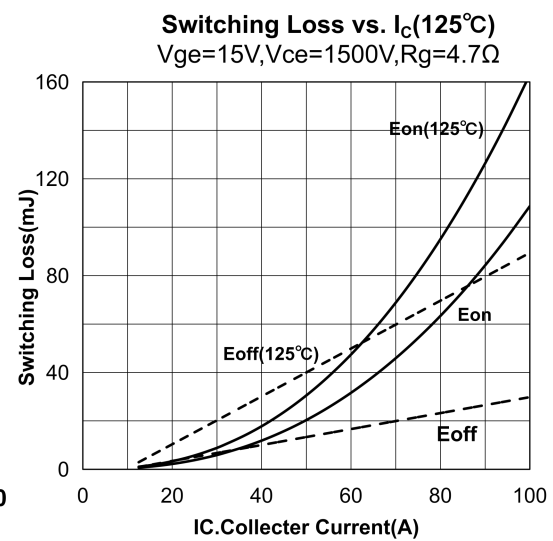
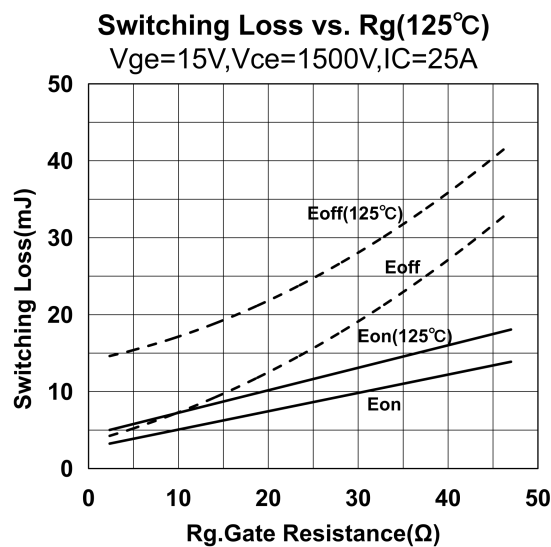
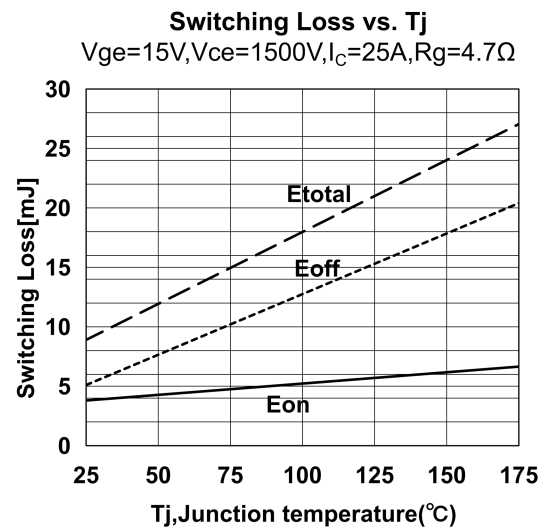
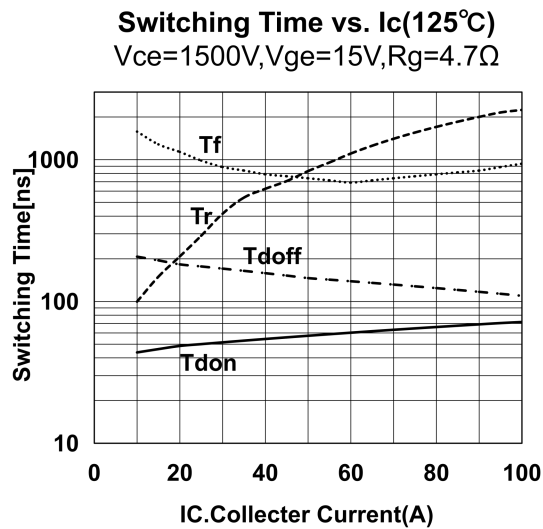
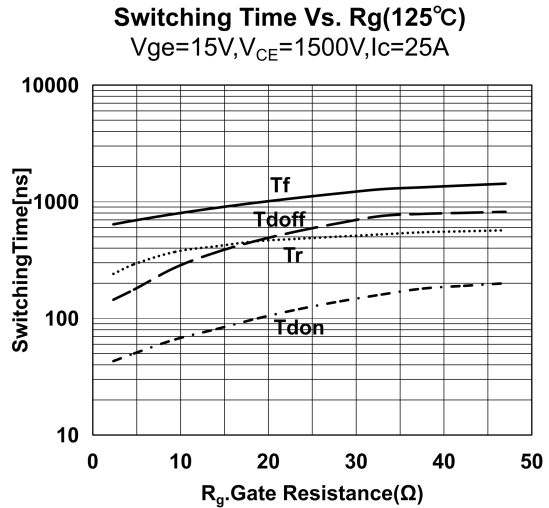
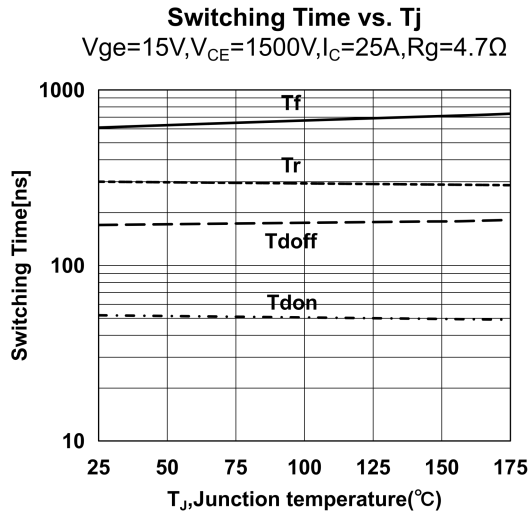


Normalized Collector to Emitter Breakdown Voltage vs. Junction Temperature

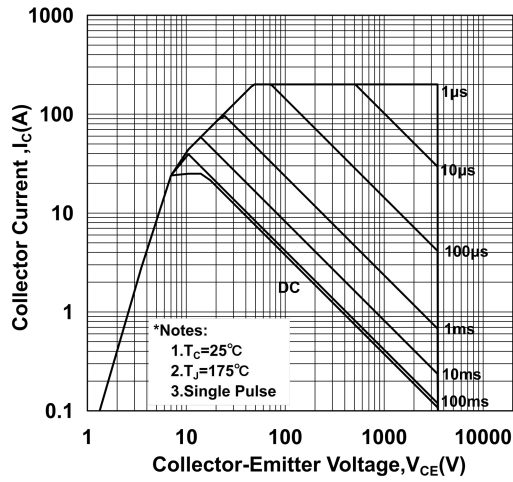


Normalized Maximum Collector-Emitter Current Standard Derating Curve

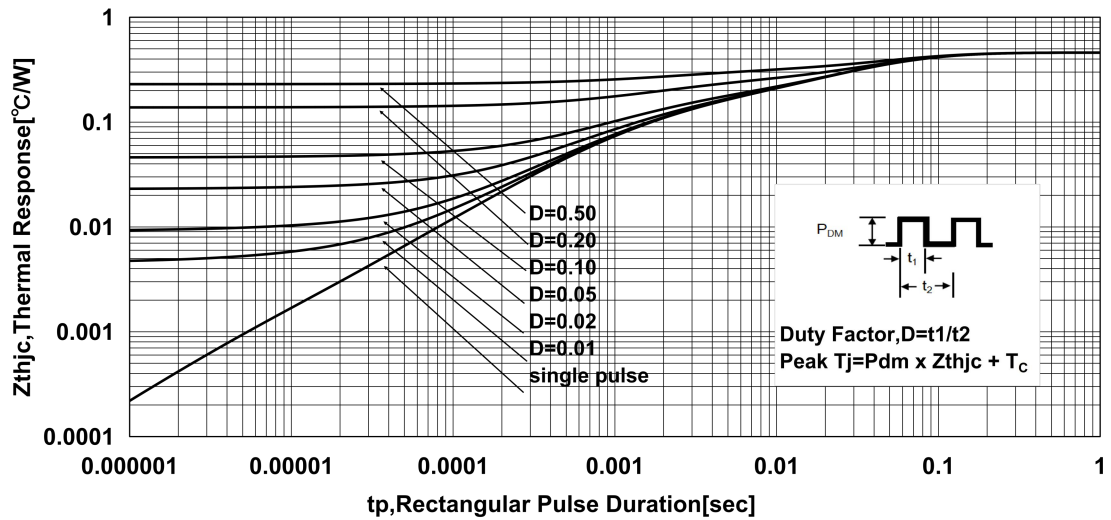




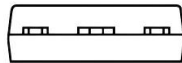
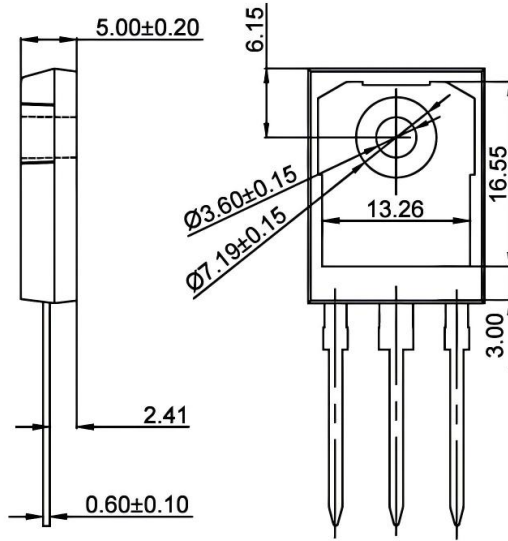
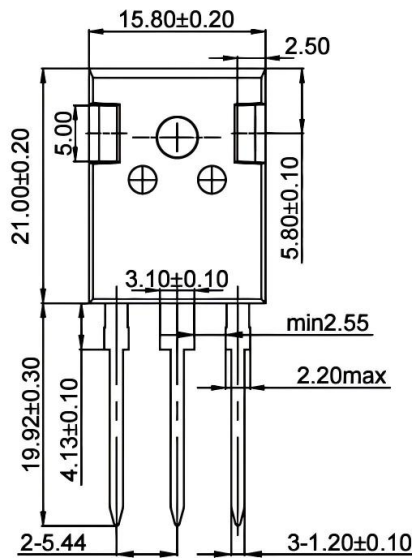
Forward Bias Safe Operating Area



Transient Thermal Impedance of IGBT

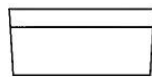
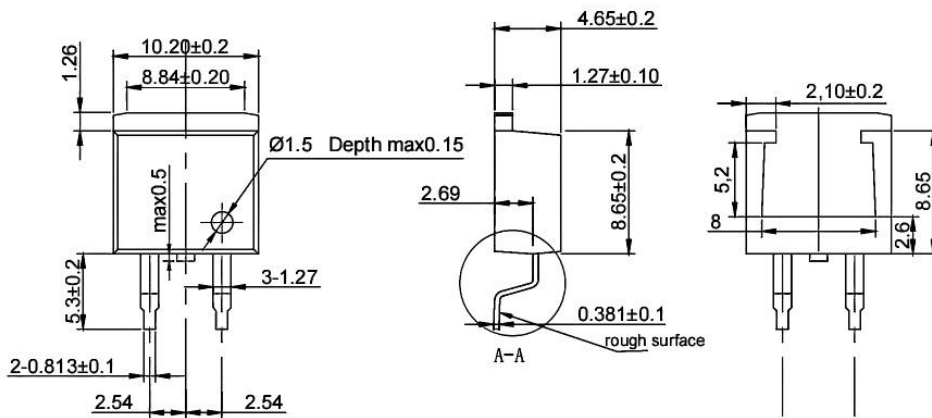


Package outline dimension



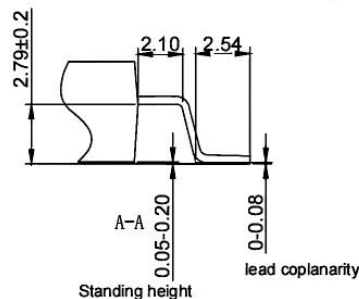
NOTES: 1. surface roughness Ra = 1.14±0.20um
2. Unmarked tolerance ±0.15
3. unit: mm

TO-247



TO-263

The plastic sealing surface is bright



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