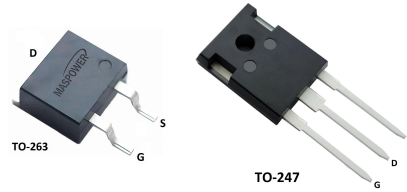


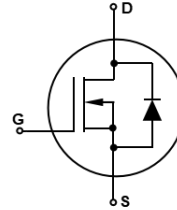
Features

- Depletion Mode MOSFET
- $V_{DSX} = 1700V$, $I_{D(on)min}=3A$
 $R_{DS(on)max}=9\Omega$
- Normally ON mode
- High Power Density



Applications

- Audio Amplifiers
- Start-Up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads



Electrical ratings

Absolute maximum ratings			
Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DSX}	1700	V
Drain-gate voltage, ($R_{GS}=1M\Omega$)	V_{DGX}	1700	
Gate- source voltage(continuous)	V_{GSX}	± 20	
Gate- source voltage(transient)	V_{GSM}	± 30	
Total dissipation at $T_C = 25^\circ C$	P_D	290	W
Total dissipation at $T_C = 100^\circ C$		116	W
Operating junction temperature	T_J	-55 ~ 150	$^\circ C$
Storage temperature	T_{stg}		
Maximum lead temperature for soldering purpose	T_L	300	$^\circ C$

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

On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSX}$	$I_D = 250 \mu A$, $V_{GS} = -5V$	1700			V
Drain leakage current	$I_{DSX(off)}$	$V_{GS} = -5V$, $V_{DS} = \text{Max rating}$			10	μA
		$V_{GS} = -5V$, $V_{DS} = \text{Max rating}$, $T_C = 125^\circ C$	-	-	100	
Gate-body leakage current	I_{GSX}	$V_{GS} = \pm 20 V$, $V_{DS} = 0V$			± 200	nA
Gate turn-off voltage	$V_{GS(off)}$	$V_{DS} = 25V$, $I_D = 250 \mu A$	-2	-3	-4	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 0V$, $I_D = 0.5A$, (note1)	-	6	9	Ω

Static drain-source on current	I _{D(on)}	V _{GS} =0V, V _{DS} =50V(note1)	3	-	-	A
Dynamic						
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Forward transconductance	g _{fs}	V _{DS} = 30 V, I _D = 0.5A	0.7	1.5		S
Input capacitance	C _{iss}	V _{DS} =25V,f=1MHz, V _{GS} =-10V		1350		pF
Output capacitance	C _{oss}			110		pF
Reverse transfer capacitance	C _{rss}			14		pF
Total gate charge	Q _g	V _{DD} =850V,I _D =0.5A V _{GS} =± 5V		45		nC
Gate-source charge	Q _{gs}			6		nC
Gate-drain charge	Q _{gd}			23		nC
Switching times						
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Turn-on delay time	t _{d(on)}	V _{DD} = 750 V, I _D =0.5 A, R _G = 10Ω, V _{GS} = ±5V		45		ns
Rise time	t _r			36		ns
Turn-off-delay time	t _{d(off)}			110		ns
Fall time	t _f			115		ns
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward on voltage	V _{SD}	I _{SD} = 1 A, V _{GS} = -10V(note1)		0.75	1.3	V
Reverse recovery time	t _{rr}	I _{SD} = 1A, -di/dt=100A/μs V _{DD} = 100 V ,V _{GS} =-10V		2500		ns
Reverse recovery charge	Q _{rr}			62		μC
Reverse recovery current	I _{RRM}			44		A

Thermal data

Parameter	Symbol	Value	Unit
Thermal resistance junction-case,max	$R_{thj-case}$	0.43	$^{\circ}C/W$
Thermal resistance junction-ambient,max	$R_{thj-amb}$	50	

Ordering information

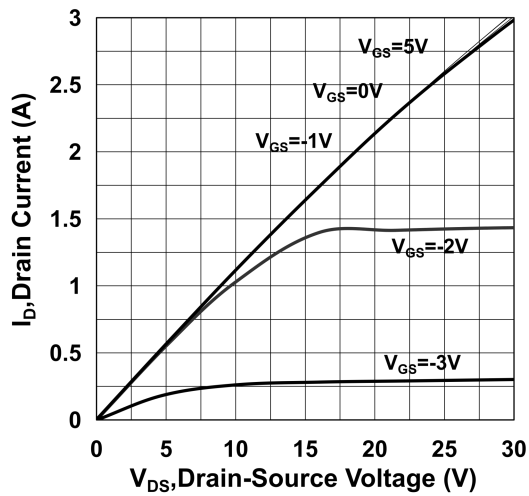
Ordering Code	Silkscreen	Package
MS3NH170HGE0	MS3NH170HGE0	TO-263
MS3NH170HGC0	MS3NH170HGC0	TO-247

note:

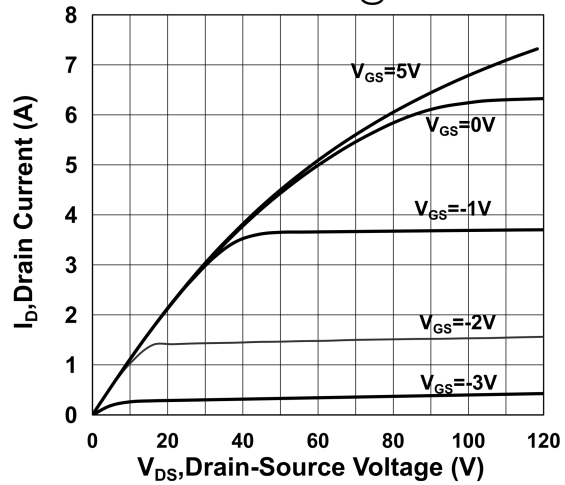
1. Pulse test, $t \leq 300\mu s$, duty cycle, $d \leq 2\%$

Electrical characteristics

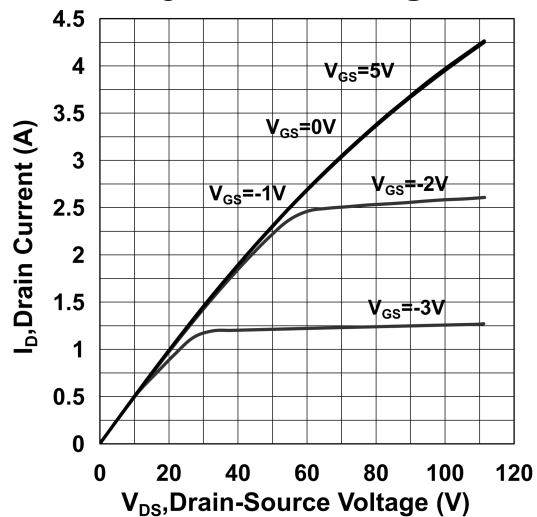
On-Region Characteristic@25°C



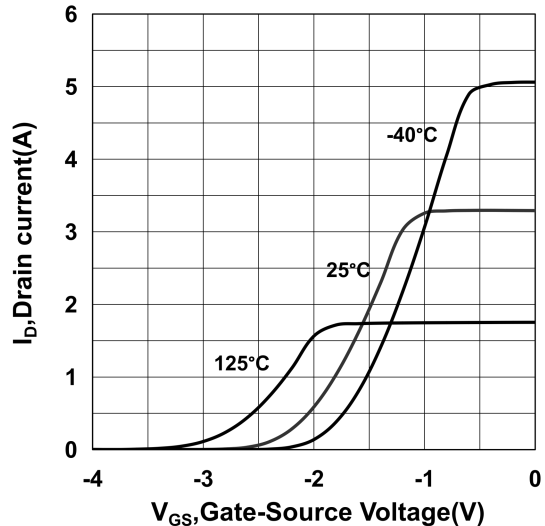
Extended On-Region Characteristic@25°C



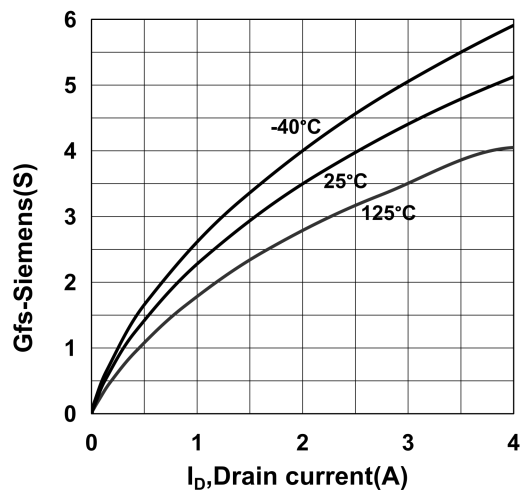
On-Region Characteristic@125°C



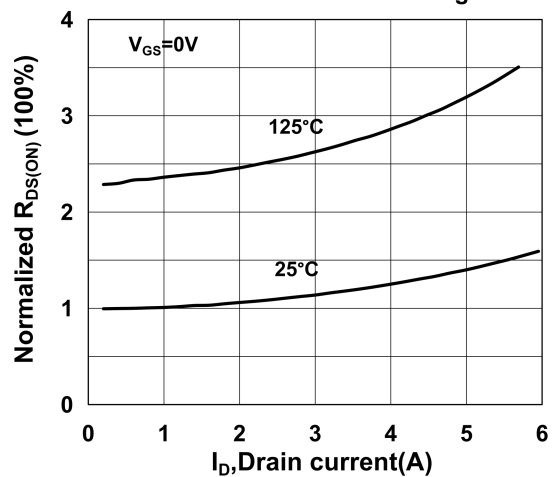
Transfer Characteristics



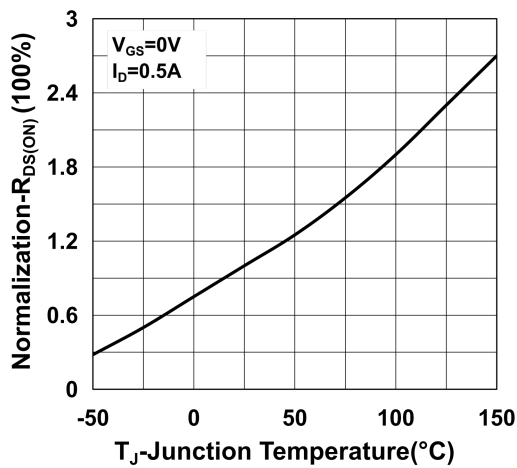
Transconductance



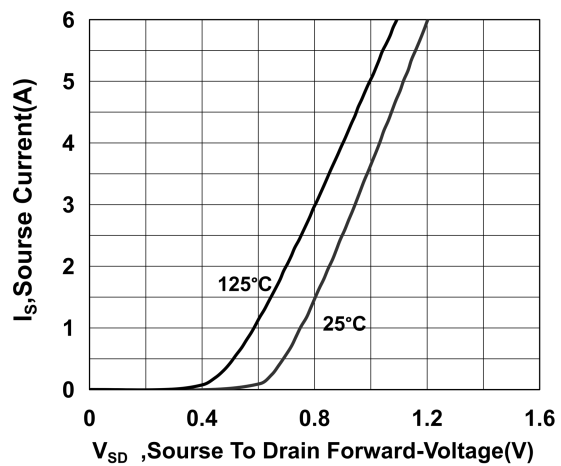
Normalized On-Resistance Variation vs Drain Current and Gate Voltage



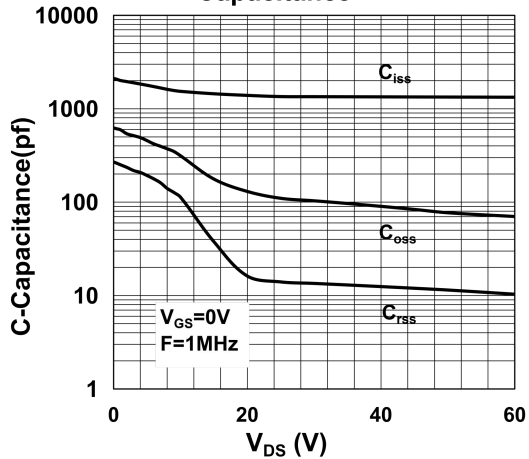
Normalization On-Resistance
Variation vs Junction Temperature



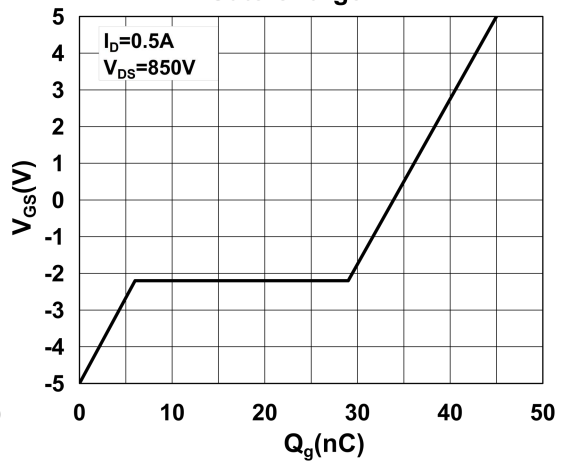
Body Diode Forward Voltage Variation
with Source Current and Temperature



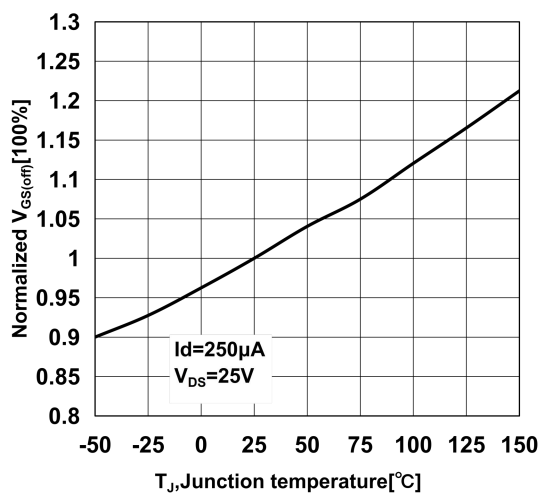
Capacitance



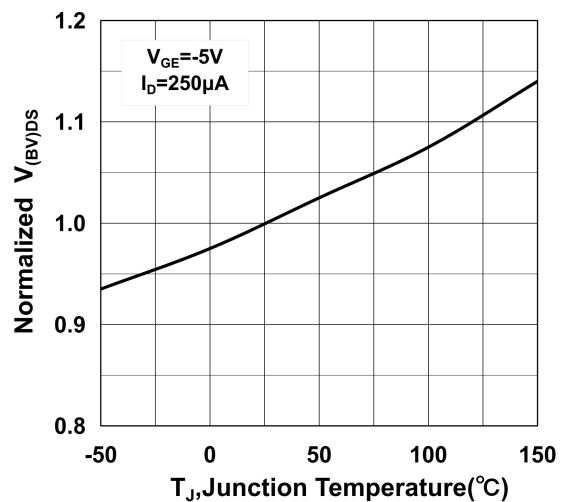
Gate Charge



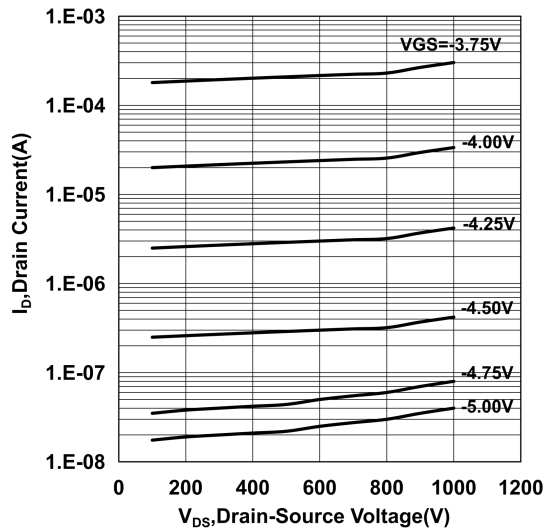
Normalized gate threshold voltage vs
temperature



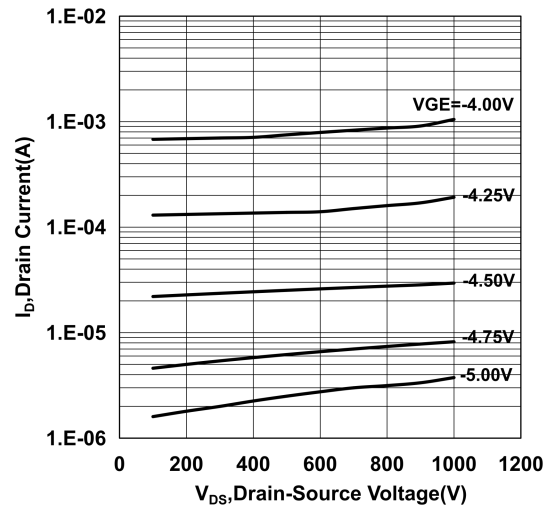
Normalized $V_{(BV)DS}$ vs temperature



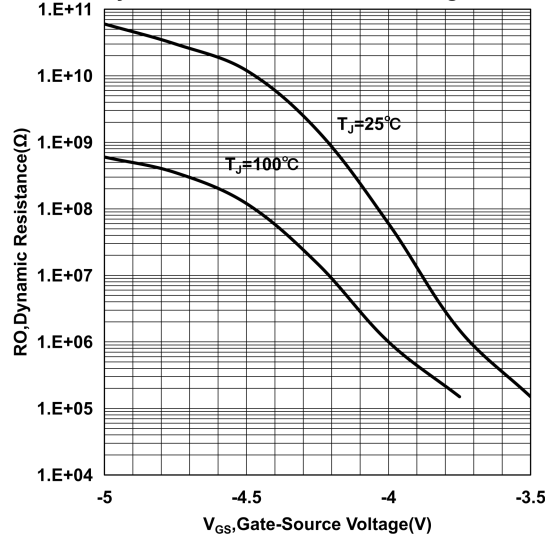
Drain Current @ $T_J=25^\circ\text{C}$



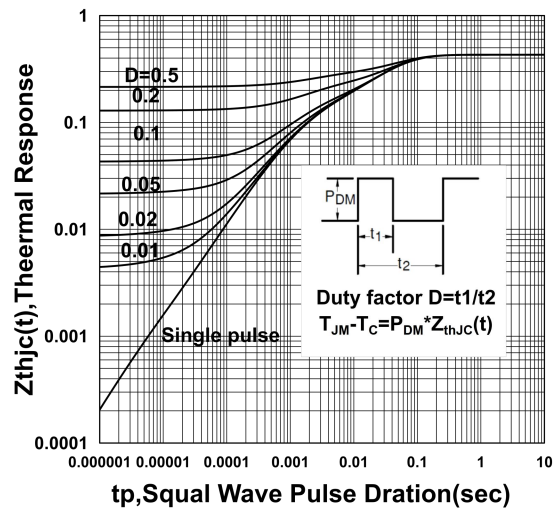
Drain Current @ $T_J=100^\circ\text{C}$



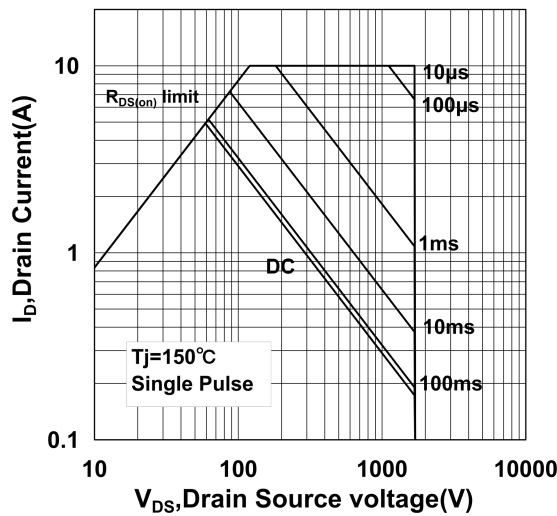
Dynamic Resistance vs Gate Voltage



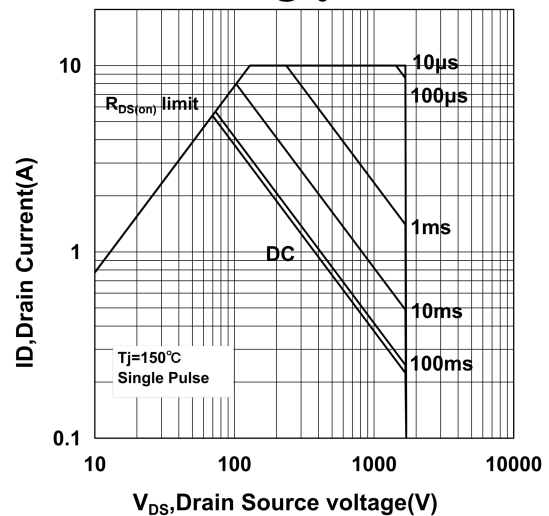
Transient response Curve



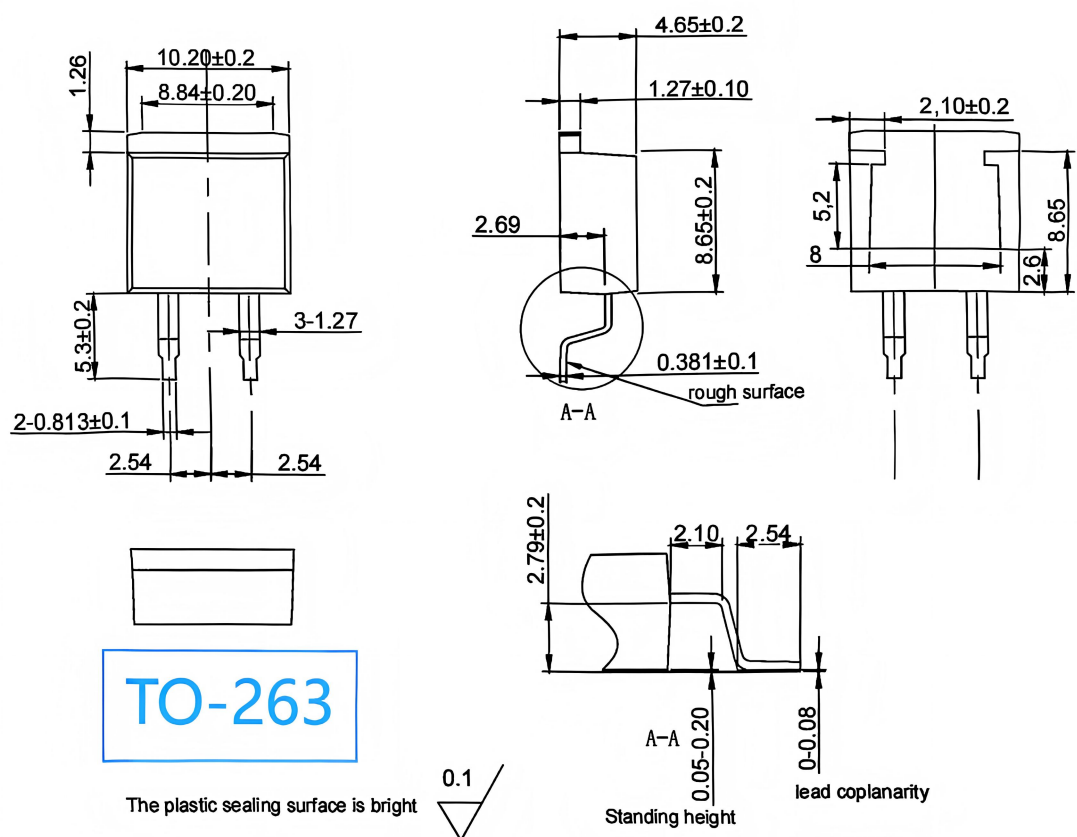
Forward-Bias Safe Operating Area @ $T_C=25^\circ\text{C}$



Forward-Bias Safe Operating Area @ $T_C=75^\circ\text{C}$

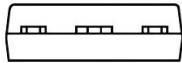
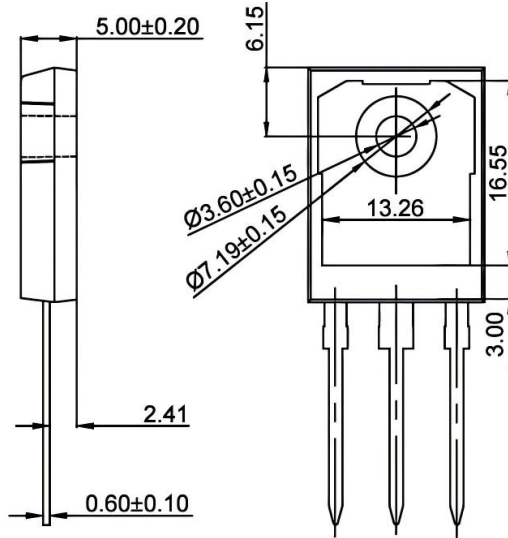
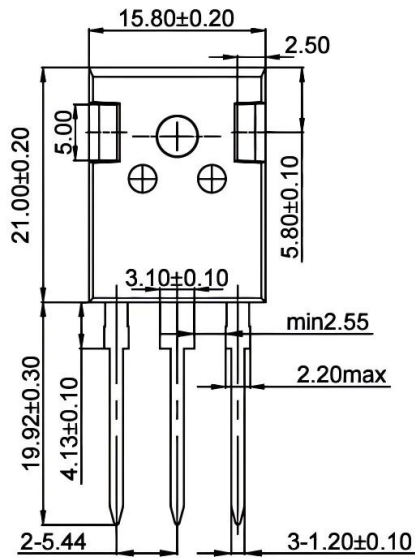


Package outline dimension



Notes:

1. unmarked tolerance $\pm 0.15\text{mm}$; unmarked $R < 0.15\text{mm}$
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



NOTES: 1. surface roughness $R_a = 1.14 \pm 0.20 \mu m$
 2. Unmarked tolerance ± 0.15
 3. unit: mm

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