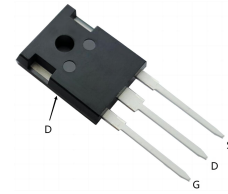


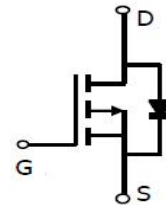
Features

- $V_{DS}=-600V, I_D=-16A$
 $R_{DS(on), Type}=680m\Omega @ V_{GS}=-10V$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



Absolute Ratings ($T_C=25^\circ C$)

Parameter	Symbol		Limit	Unit
Drain-Source Voltage	V_{DSS}		-600	V
Transient Gate-Source Voltage	V_{GSM}		± 30	V
Continuous Gate-Source Voltage	V_{GSS}		± 20	V
Drain Current-continuous	I_D		-16	A
	$I_D(T_C=100^\circ C)$		-10	A
Drain Current-pulse (note 1)	I_{DM}		-48	A
Single Pulsed Avalanche Energy (note 2)	E_{AS}		2000	mJ
Maximum Power Dissipation	P_D	$T_C=25^\circ C$	462	W
		$T_C=100^\circ C$	185	W
Operating and Storage Temperature Range	T_J, T_{STG}		-55~+150	$^\circ C$
Maximum Lead Temperature for Soldering Purpose	T_L		300	$^\circ C$
Mounting Torque	M_d		1.13	Nm
Weight	TO-247		6.0	g

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
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Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	-600	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-V_{DSS}, V_{GS}=0V$	-	-	-25	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-2.6	-3.6	-4.6	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-1A$	-	680	850	m Ω
Forward Trans-conductance	g_{fs}	$V_{DS}=-5V, I_D=-1A$ (note 4)	-	4.6	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0MHz$	-	5485	-	pF
Output capacitance	C_{oss}		-	410	-	pF
Reverse transfer capacitance	C_{rss}		-	54	-	pF

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching-Characteristics						
Turn-On delay time	t _{d(on)}	V _{DD} =-300V,I _D =-20A, R _G =3Ω,V _{GS} =-10V (note 4,5)	-	27	-	ns
Turn-On rise time	t _r		-	23	-	ns
Turn-Off delay time	t _{d(Off)}		-	57	-	ns
Turn-Off rise time	t _f		-	35	-	ns
Total Gate Charge	Q _g	V _{DS} =-300V,I _D =-8A, V _{GS} =-10V (note 4,5)	-	90	-	nC
Gate-Source charge	Q _{gs}		-	25	-	nC
Gate-Drain charge	Q _{gd}		-	22	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =-1A	-	-0.78	-1.2	V
Diode Forward Current	I _S	-	-	-	-16	A
Repetitive Pulse Drain-Source Diode Forward Current	I _{SM}	-	-	-	-64	A

Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=-8A$ $V_{SD}=-100V$ $-di_F/dt=-150A/\mu s$ (note 4)	-	450	-	ns
Reverse recovery charge	Q_{rr}		-	7000	-	nC
Reverse recovery Current	I_{rr}		-	-32	-	A

Thermal Characteristics

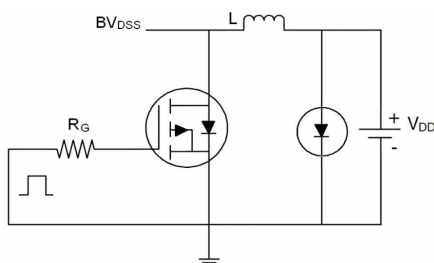
Parameter	Symbol	Value	Unit
Thermal Resistance, junction to Case	$R_{th}(J-C)$	0.42	$^{\circ}C/W$
Thermal Resistance, junction to Ambient	$R_{th}(J-A)$	40	$^{\circ}C/W$

Notes:

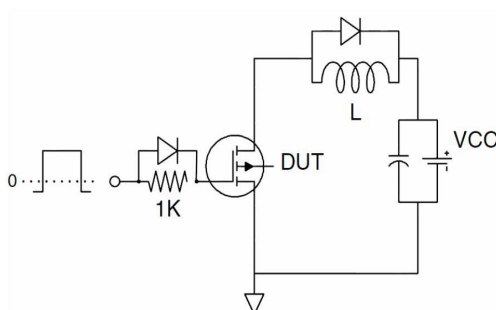
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. EAS condition: $T_j=25^{\circ}C, V_{DD}=-30V, V=-10V, L=0.5mH, R_g=25\Omega$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Test Circuit

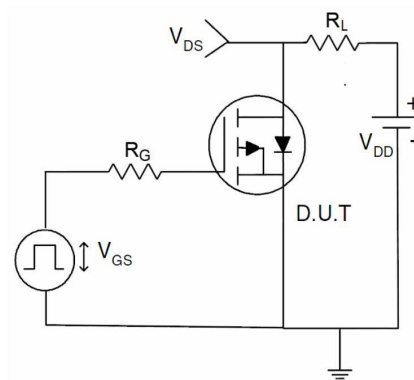
(1) EAS Test Circuit



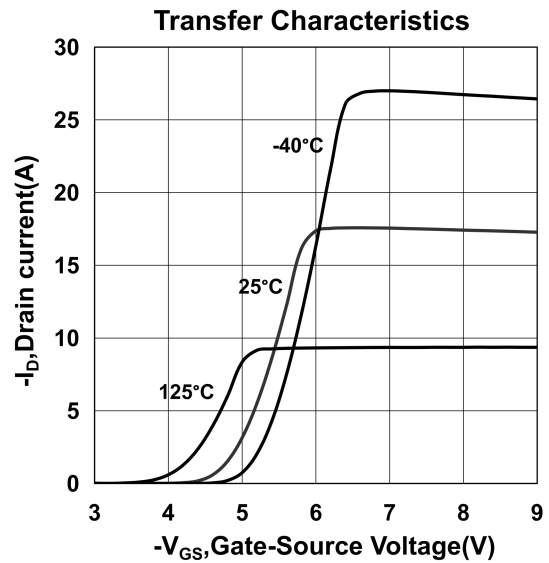
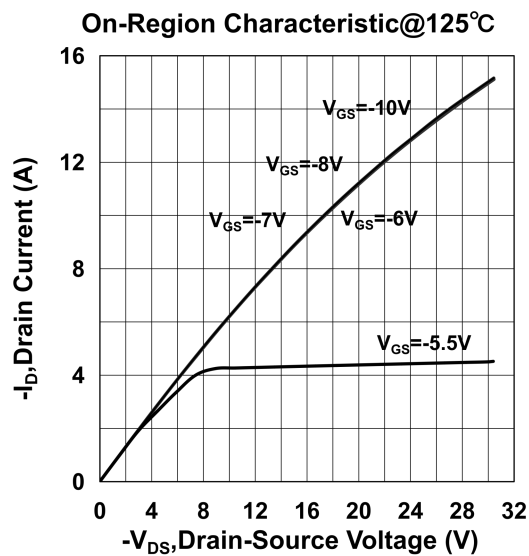
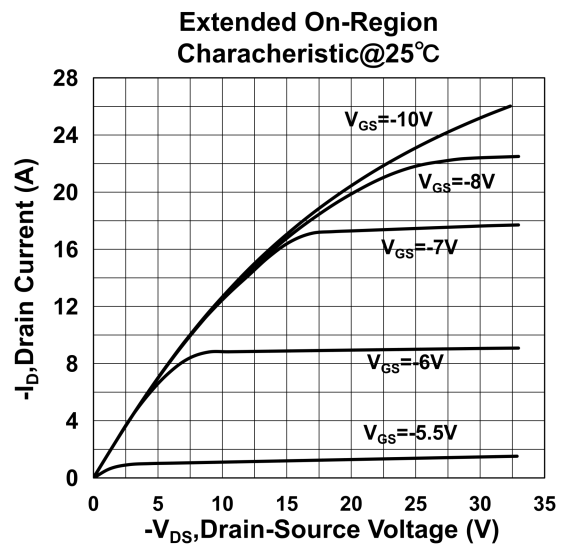
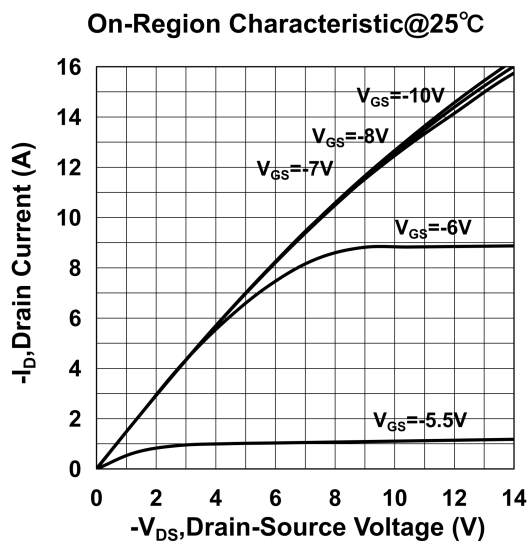
(2) Gate Charge Test Circuit

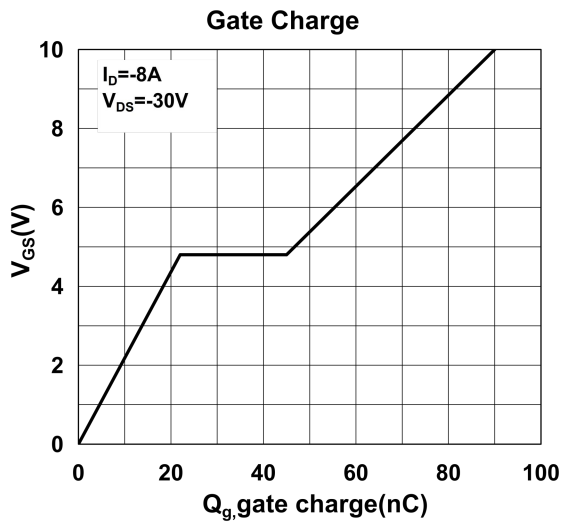
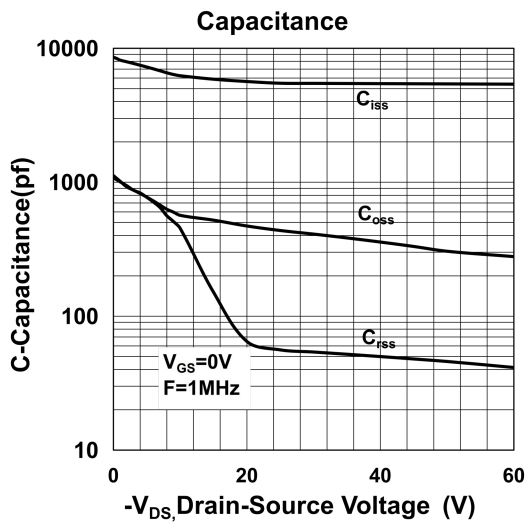
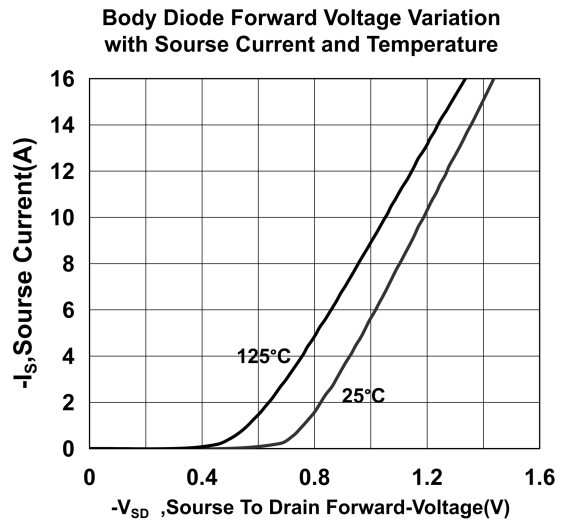
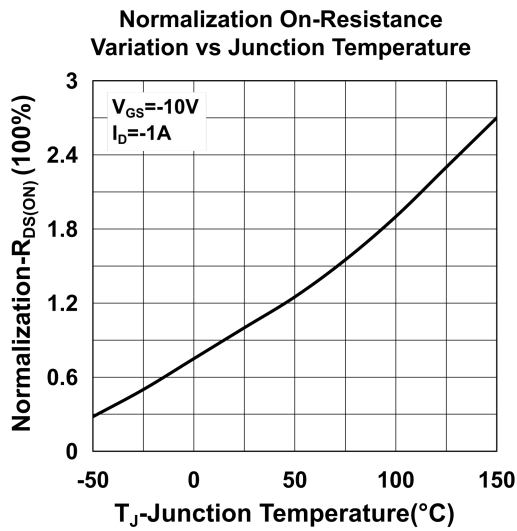
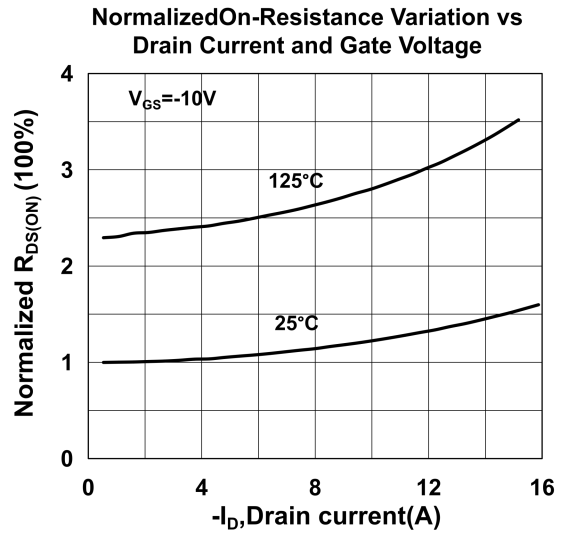
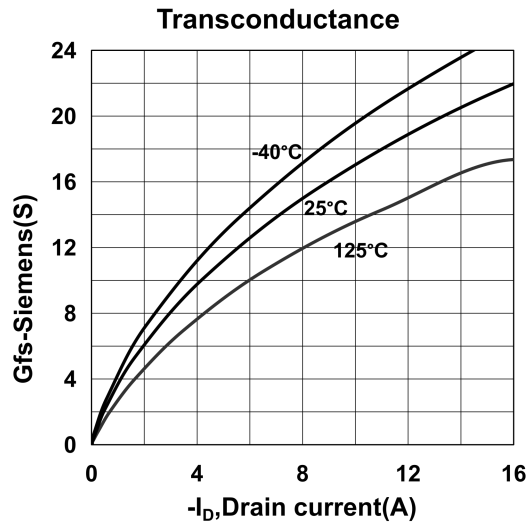


(3) Switch Time Test Circuit

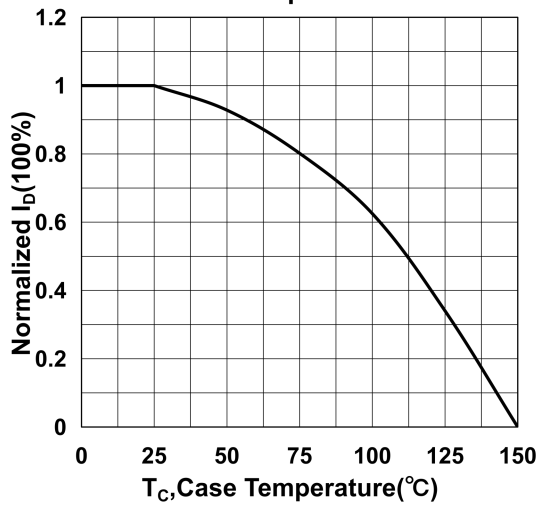


Typical characteristic curves

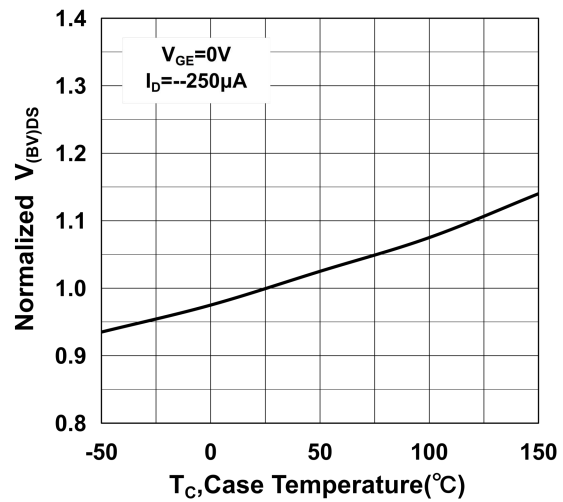




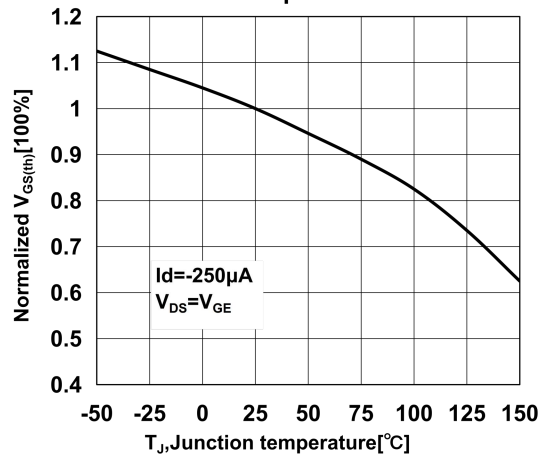
Maximum Drain Current vs Case Temperature



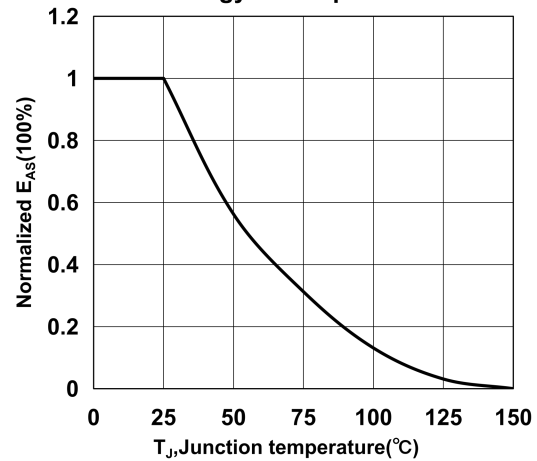
Normalized $V_{(BV)DS}$ vs temperature



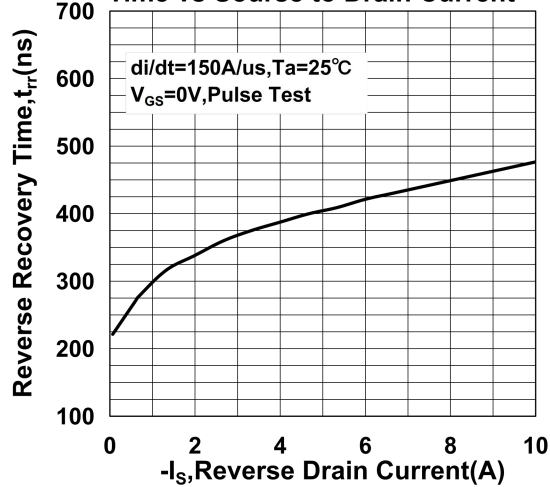
Normalized gate threshold voltage vs temperature



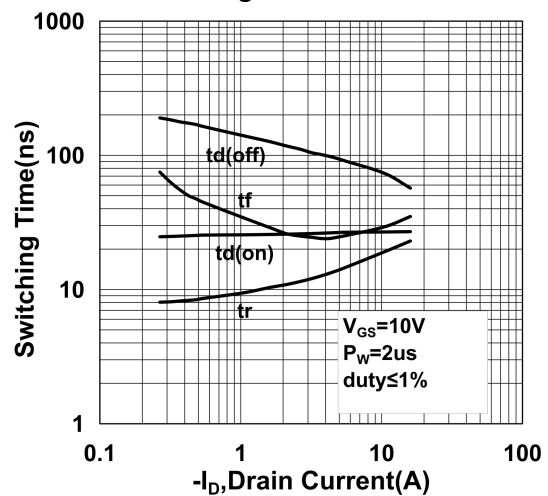
Normalized maximum avalanche energy vs temperature

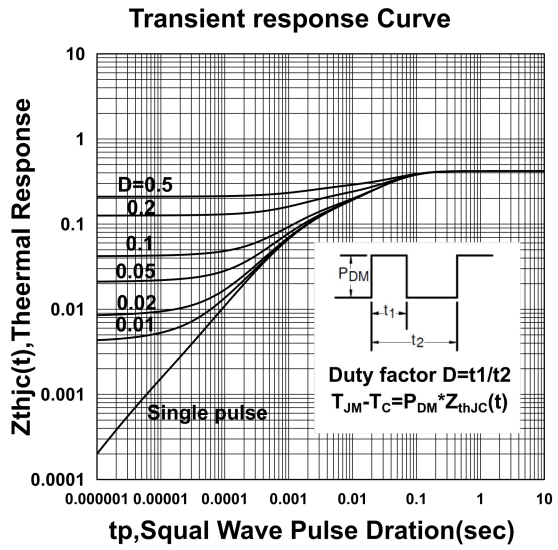
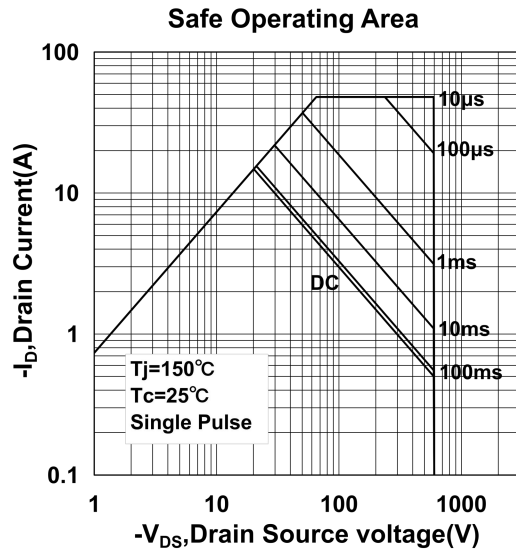


Body Diode Reverse Recovery Time vs Source to Drain Current

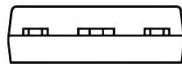
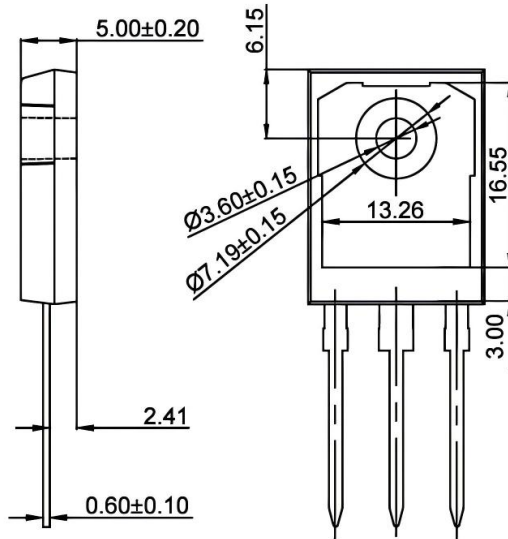
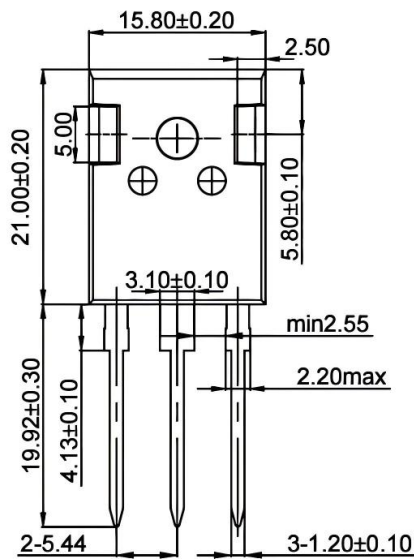


Switching Characteristics





Package Mechanical DATA



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

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