



# ACE18010M04N

## N-Channel 100-V MOSFET

### Description

The ACE18010M04N uses advanced trench technology to provide excellent  $R_{DS(on)}$  and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

### Features

- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
100	6.5 @ $V_{GS} = 10V$	180A
	8.5 @ $V_{GS} = 5.5V$	

### Applications

- LED Inverter Circuits
- DC/DC Conversion Circuits
- Motor drives

### Absolute Maximum Ratings

Parameter	Symbol	Limit	Units	
Drain-Source Voltage	$V_{DS}$	100	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>a</sup>	$I_D$	180	A	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	700	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	180	A	
Power Dissipation <sup>a</sup>	$P_D$	300	W	
Single Pulse Avalanche Energy <sup>d</sup>	$E_{AS}$	500	mJ	
Operating temperature / storage temperature	$T_J/T_{STG}$	-55~175	$^{\circ}C$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>c</sup>	$R_{\theta JA}$	62.5	$^{\circ}C/W$
		0	

### Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.
- $T_j=25^{\circ}C$ ,  $L=0.51mH$ ,  $I_D=45A$ ,  $V_{DD}=50V$

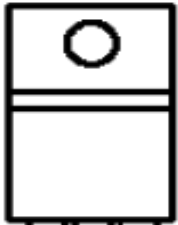


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### Packaging Type

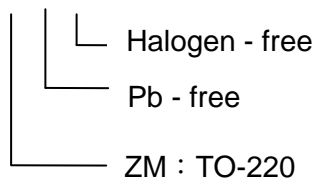
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### Ordering information

ACE18010M04N XX + H





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### Electrical Characteristics

$T_A=25^{\circ}\text{C}$ , unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS}= 0 \text{ V}, V_{GS}= \pm 20 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA
		$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^{\circ}\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	220			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$			6.5	m $\Omega$
		$V_{GS} = 5.5 \text{ V}, I_D = 16 \text{ A}$			8.5	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 \text{ V}, I_D = 20 \text{ A}$		18		S
Diode Forward Voltage	$V_{SD}$	$I_S = 90 \text{ A}, V_{GS} = 0 \text{ V}$		1		V
Dynamic						
Total Gate Charge	$Q_g$	$V_{DS} = 50 \text{ V}, V_{GS} = 5.5 \text{ V}, I_D = 20 \text{ A}$		78		nC
Gate-Source Charge	$Q_{gs}$			42		
Gate-Drain Charge	$Q_{gd}$			27		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 50 \text{ V}, R_L = 2.5 \Omega, I_D = 20 \text{ A},$ $V_{GEN} = 10 \text{ V}, R_{GEN} = 6 \Omega$		49		ns
Rise Time	$t_r$			37		
Turn-Off Delay Time	$t_{d(off)}$			117		
Fall Time	$t_f$			51		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		8681		pF
Output Capacitance	$C_{oss}$			730		
Reverse Transfer Capacitance	$C_{rss}$			331		

Note :

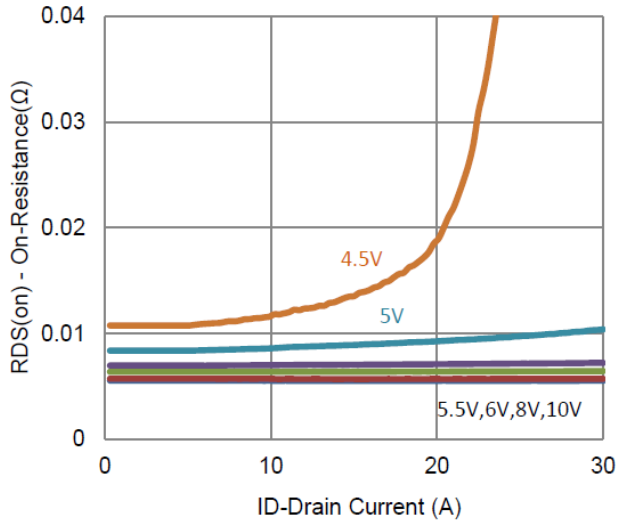
- a. Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- b. Guaranteed by design, not subject to production testing



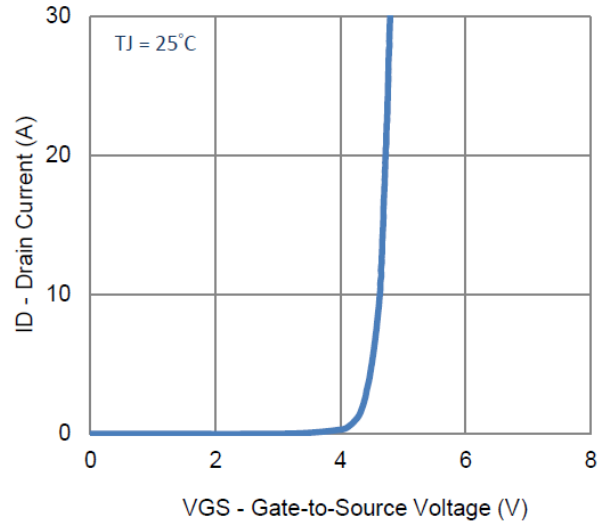
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## N-Channel 100-V MOSFET

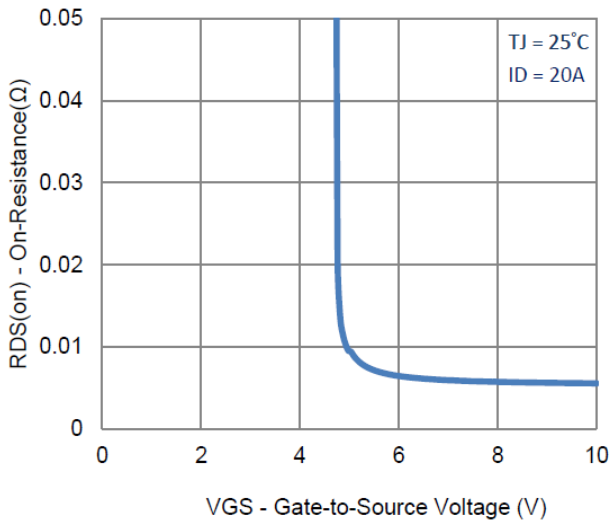
### Typical Performance Characteristics



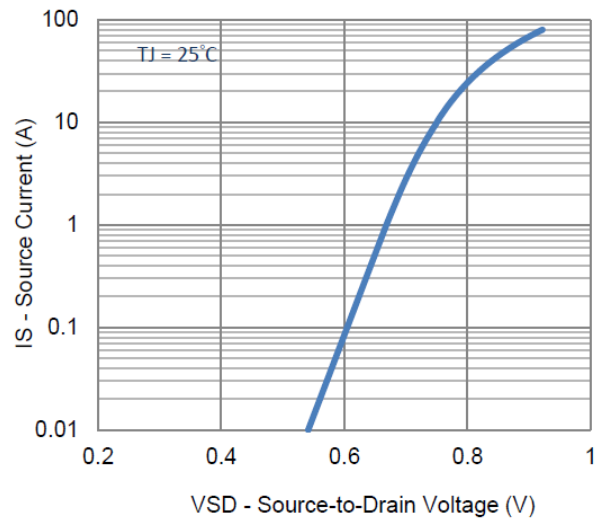
1. On-Resistance vs. Drain Current



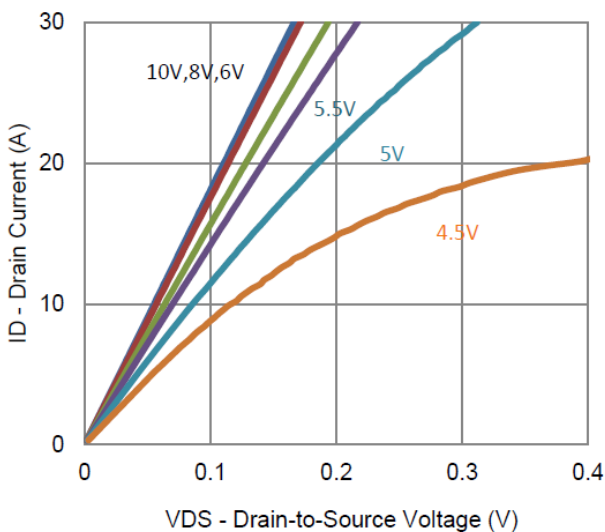
2. Transfer Characteristics



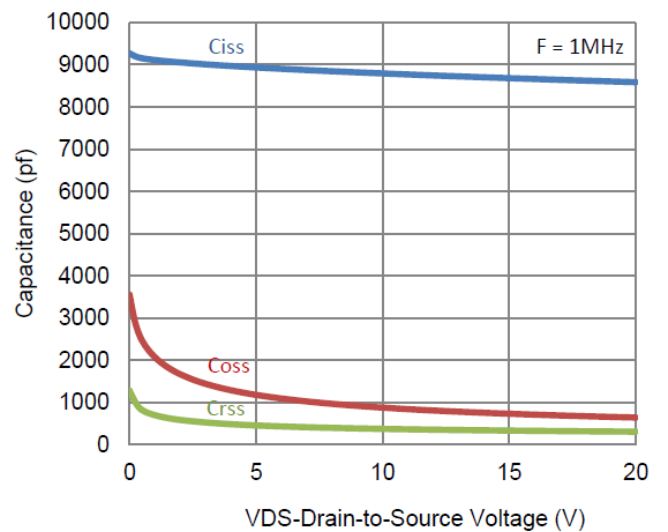
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage



5. Output Characteristics

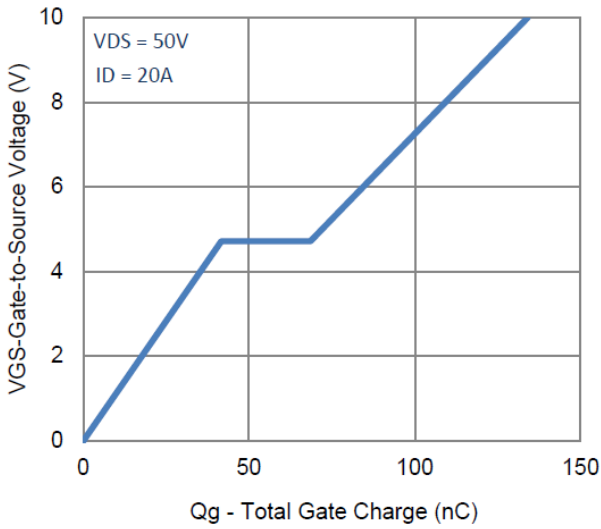


6. Capacitance

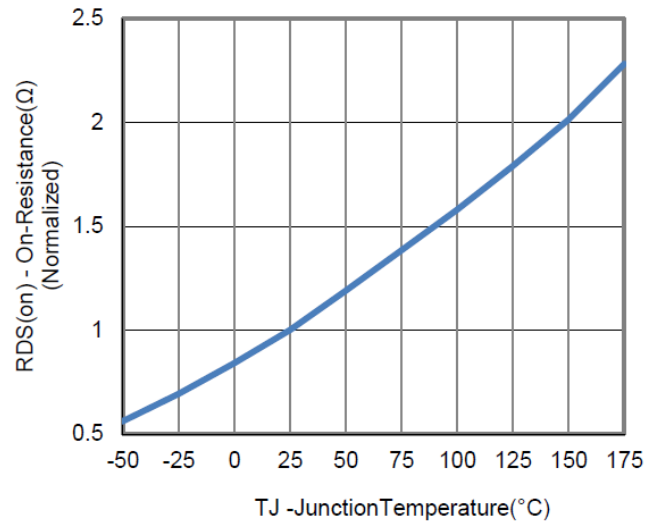


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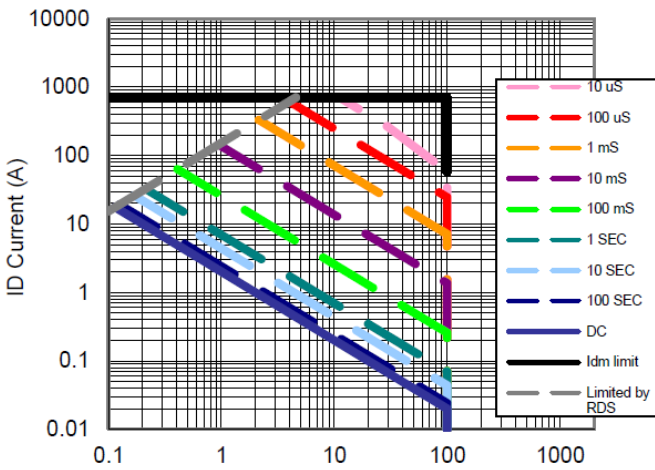
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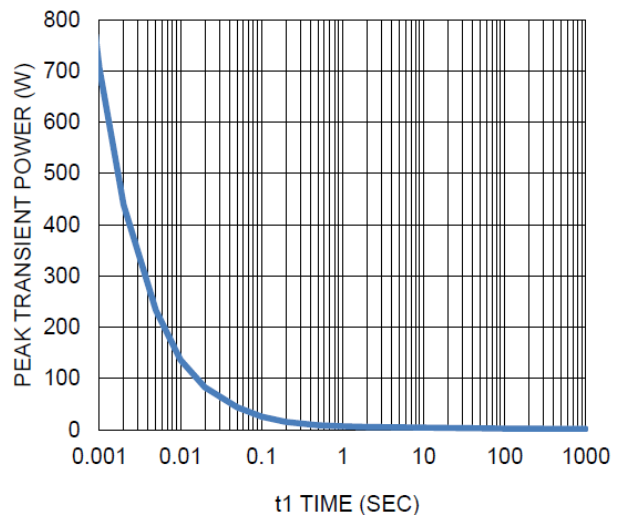
7. Gate Charge



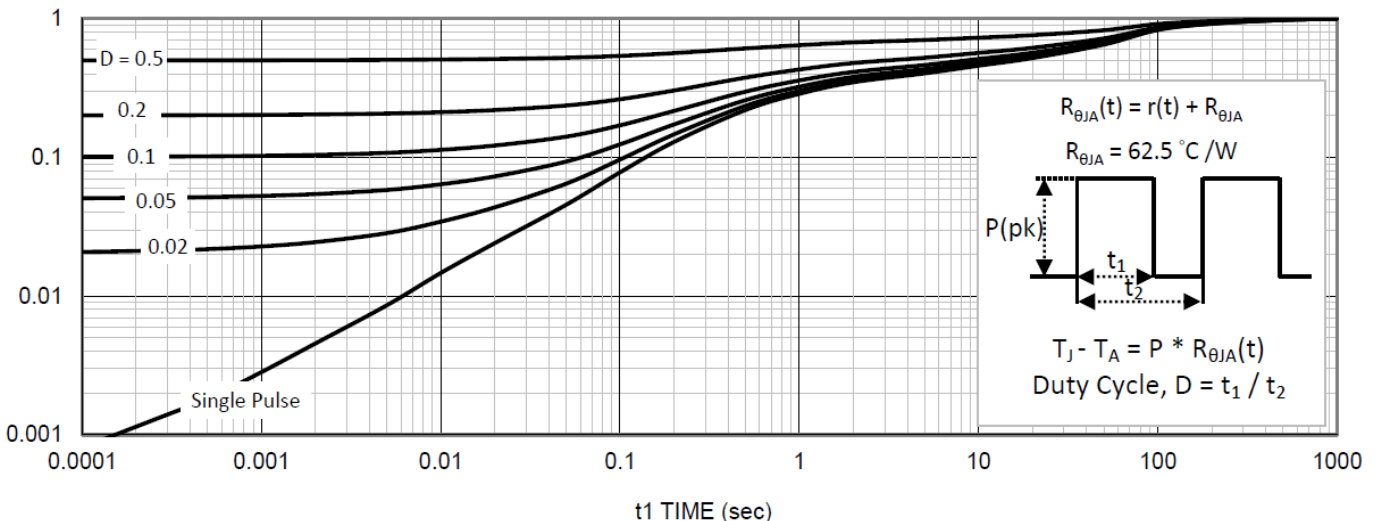
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



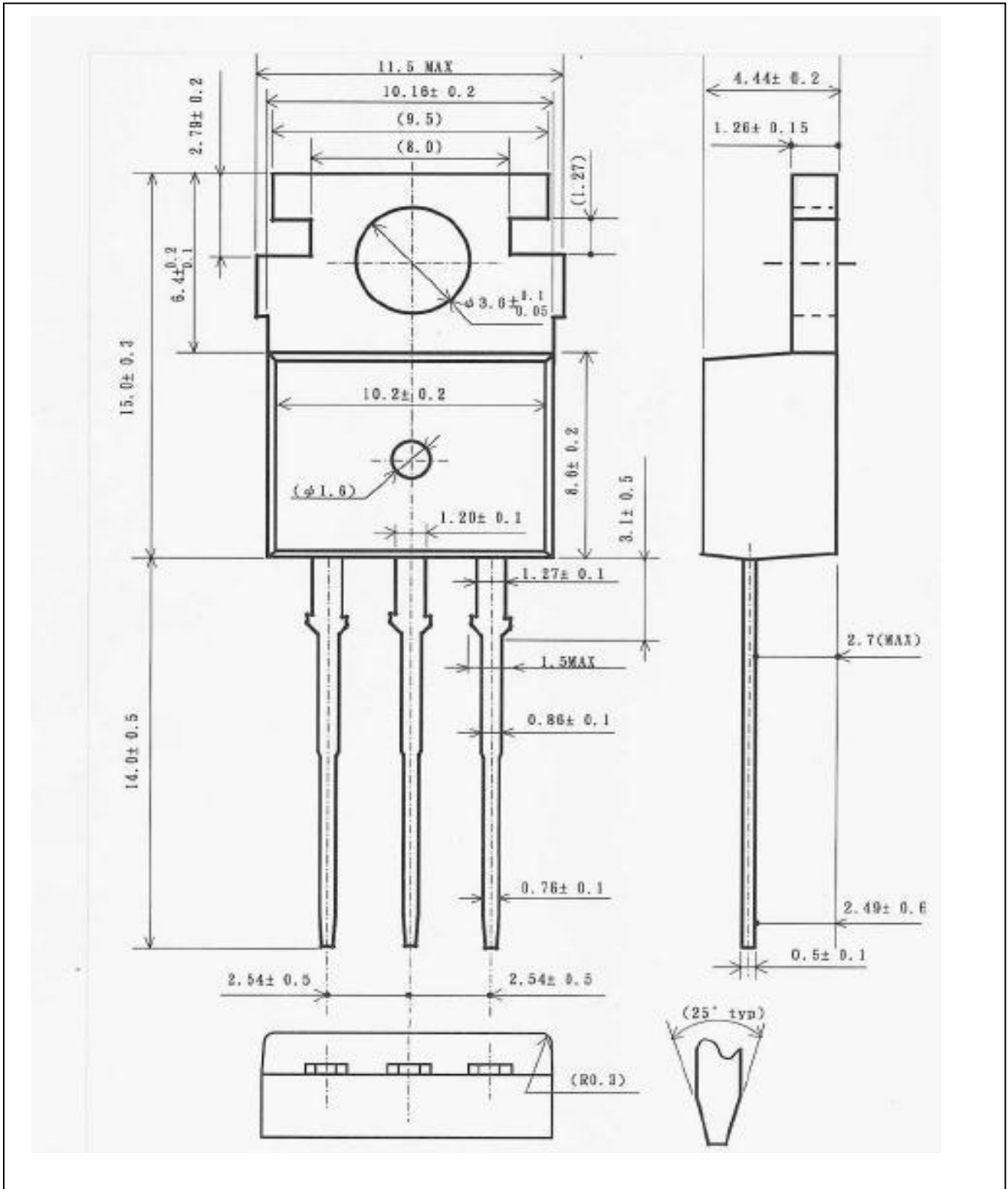
11. Normalized Thermal Transient Junction to Ambient



# ACE18010M04N N-Channel 100-V MOSFET

## Packing Information

TO-220





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### Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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